Knee Data - Discrete Mixture Model

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The "knee"–data from "catdata" are loaded.

```r
library(catdata)
data(knee)
```

The data set contains longitudinal data and is currently in the "wide" format, now it is transformed into the "long" format by the function "reshape".

In addition the response is dichotomized, "age" is centered around 30 and a quadratic effect "age2" of age is created.

```r
knee <- reshape(knee, direction="long", varying=list(5:8), v.names="R",
                timevar="Time")

knee$RD <- rep(0, length(knee$R))
knee$RD[knee$R>2] <- 1

knee$Age <- knee$Age - 30
knee$Age2<-knee$Age^2
```

The covariates "Th" and "Sex" are factorized.

```r
knee$Th <- as.factor(knee$Th)
knee$Sex <- as.factor(knee$Sex)
```

For discrete mixture models the library "flexmix" is used.

```r
library(flexmix)
```

Now some discrete mixture models are fitted, each with another number of components. Every model fits fixed effects for the covariates "Th", "Sex", "Age" and "Age2" while the intercepts vary across components.

```r
kneeflex2 <-stepFlexmix(cbind(RD,1-RD) ~ 1 | N, model = FLXMRglmfix(family =
  "binomial", fixed= ~ Th + Sex + Age + Age2), k = 2, nrep = 5, data = knee)

kneeflex3 <-stepFlexmix(cbind(RD,1-RD) ~ 1 | N, model = FLXMRglmfix(family =
  "binomial", fixed= ~ Th + Sex + Age + Age2), k = 3, nrep = 5, data = knee)

kneeflex4 <-stepFlexmix(cbind(RD,1-RD) ~ 1 | N, model = FLXMRglmfix(family =
  "binomial", fixed= ~ Th + Sex + Age + Age2), k = 4, nrep = 5, data = knee)
```

We compare the fitted models by BIC.

```
summary(kneeflex2)@BIC
summary(kneeflex3)@BIC
summary(kneeflex4)@BIC
```

As the model with two components has the lowest BIC, the coefficients of that model are printed.

```
summary(refit(kneeflex2))
```