

# Addiction - Multinomial Model with Hierarchically Structured Response

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First the "addiction" data are loaded and attached.

```
> library(catdata)
> data(addiction)
> attach(addiction)
```

For the Multinomial Model with hierarchically structured response we use simple Logit Models. For the first model, which models the effect of categories 0 and 1 versus 2, a new response "ill01" is created. In addition the variable "age2" for the squared effect of age is created.

```
> ill01 <- ill
> ill01[ill==0] <- 1
> ill01[ill==2] <- 0
> age2 <- age^2
```

Now the model for categories 0 and 1 versus 2 is fitted.

```
> m01vs2 <- glm(ill01 ~ as.factor(gender) + as.factor(university) + age + age2,
+ family=binomial())
> summary(m01vs2)
```

For the next model the data set has to be reduced, only observations with response categories 0 or 1 are needed. Then the variable "age2" is built.

```
> detach(addiction)
> addiction2 <- addiction[addiction$ill!=2,]
> attach(addiction2)
> age2 <- age^2
```

Finally the model for categories 0 versus 1 is fitted.

```
> m0vs1 <- glm(ill ~ as.factor(gender) + as.factor(university) + age + age2,
+ family=binomial())
> summary(m0vs1)
```