Featback analyses: PHQ

Data preparation

Primaire uitkomstmaat

- Eetstoornispathologie (EDE-Q_TOT)

Secundaire uitkomstmaten

- Self-efficacy (GSES_TOT)
- Angst en depressie (PHQ_TOT)
- Sociale steun (SSL_TOT)

Conditie indicatoren

- 1 = Featback
- 2 = Featback + ondersteuning van een ervaringsdeskundige via chat of email
- 3 = Ondersteuning van een ervaringsdeskundige via chat of email
- 4 = Wachtlijst controle conditie (hen werd conditie 2 aangeboden na 12 maanden + 8 weken wachttijd)

Tijdsindicatoren

- 1 = baseline
- 2 = post-interventie (8 weken)
- 3 = 3 maanden follow-up (i.e., 3 maanden + 8 weken)
- 4 = 6 maanden FU
- 5 = 9 maanden FU
- 6 = 12 maanden FU

Mogelijke moderatoren

- Leeftijd (Age)
- Educatie (moet nog omgezet worden naar 3 levels; laag, middel, hoog) (T0_edu)
- Behandelgeschiedenis (T0_treatment)
- BMI bij Baseline (BMI)
- Eetstoornispathologie bij baseline (EDEQ_TOT)
- (Evt. duur eetstoornis, maar is zeer hoog gecorreleerd met leeftijd; T0_yrsED)
- Motivatie om te veranderen bij baseline (T0_Motiv_TOT)
- Zelfwaardering bij baseline (T0_RSES_TOT)
- Self-efficacy bij baseline (GSES_TOT)
- Angst en depressie bij baseline (PHQ_TOT)
- Type eetstoornis bij baseline (staat nog niet tussen de variabelen; nog even kijken hoe we dit moeten aanpakken . . .)

Toevoeging 06-08-2021:

- T0_EDEQ_ObjEet_Keer (= aantal (objectieve) eetbuien in de afgelopen 28 dagen)
- T0_SSL_TOT

```
## Read in data
library("foreign")
data <- read.spss("20210316_Featback_AllMerged_LongFormat_imputed.sav",
                  to.data.frame = TRUE)
```

```r
#names(data)
## Set aprropriate variable classes
data$ID <- factor(data$ID)
data$T0_edu <- ordered(data$T0_edu)
## Abbreviate condition levels
levels(data$Condition)[levels(data$Condition)=="Waiting list"] <- "WL"
levels(data$Condition)[levels(data$Condition)=="Featback"] <- "Fb"
levels(data$Condition)[levels(data$Condition)=="Featback + expert-patient support"] <- "Fb+eps"
levels(data$Condition)[levels(data$Condition)=="expert-patient support"] <- "eps"
data$Condition <- factor(data$Condition, levels = c("WL", "eps", "Fb", "Fb+eps"))
## Check if every subject has a time 1
all(table(data$ID, data$Time == 1)[,2] == 1L)
```

```
## [1] FALSE
```

```r
## Select only pre- and post assessments
#data <- data[data$Time %in% 1:2, ]
#data$Time <- factor(data$Time)
## Construct T0 variables
for (i in unique(data$ID)) {
  data$T0_EDEQ_TOT[data$ID == i] <- data$EDEQ_TOT[data$ID == i & data$Time == 1]
  data$T0_BMI[data$ID == i] <- data$BMI[data$ID == i & data$Time == 1]
  data$T0_GSES_TOT[data$ID == i] <- data$GSES_TOT[data$ID == i & data$Time == 1]
  data$T0_PHQ_TOT[data$ID == i] <- data$PHQ_TOT[data$ID == i & data$Time == 1]
  data$T0_SSL_TOT[data$ID == i] <- data$SSL_TOT[data$ID == i & data$Time == 1]
  data$T0_eetbuien[data$ID == i] <- data$EDEQ_ObjEet_Keer[data$ID == i & data$Time == 1]
}
## Check for missings and remove
unlist(sapply(data[ , c("Age", "T0_edu", "T0_BMI", "T0_EDEQ_TOT", "T0_Motiv_TOT",
                        "T0_GSES_TOT", "T0_PHQ_TOT")], function(x) table(is.na(x))))
```

```
##          Age.FALSE       T0_edu.FALSE        T0_edu.TRUE       T0_BMI.FALSE
##             215130             215124                  6             215124
##        T0_BMI.TRUE  T0_EDEQ_TOT.FALSE   T0_EDEQ_TOT.TRUE T0_Motiv_TOT.FALSE
##                  6             215112                 18             215112
##  T0_Motiv_TOT.TRUE  T0_GSES_TOT.FALSE   T0_GSES_TOT.TRUE   T0_PHQ_TOT.FALSE
##                 18             215112                 18             215130
```

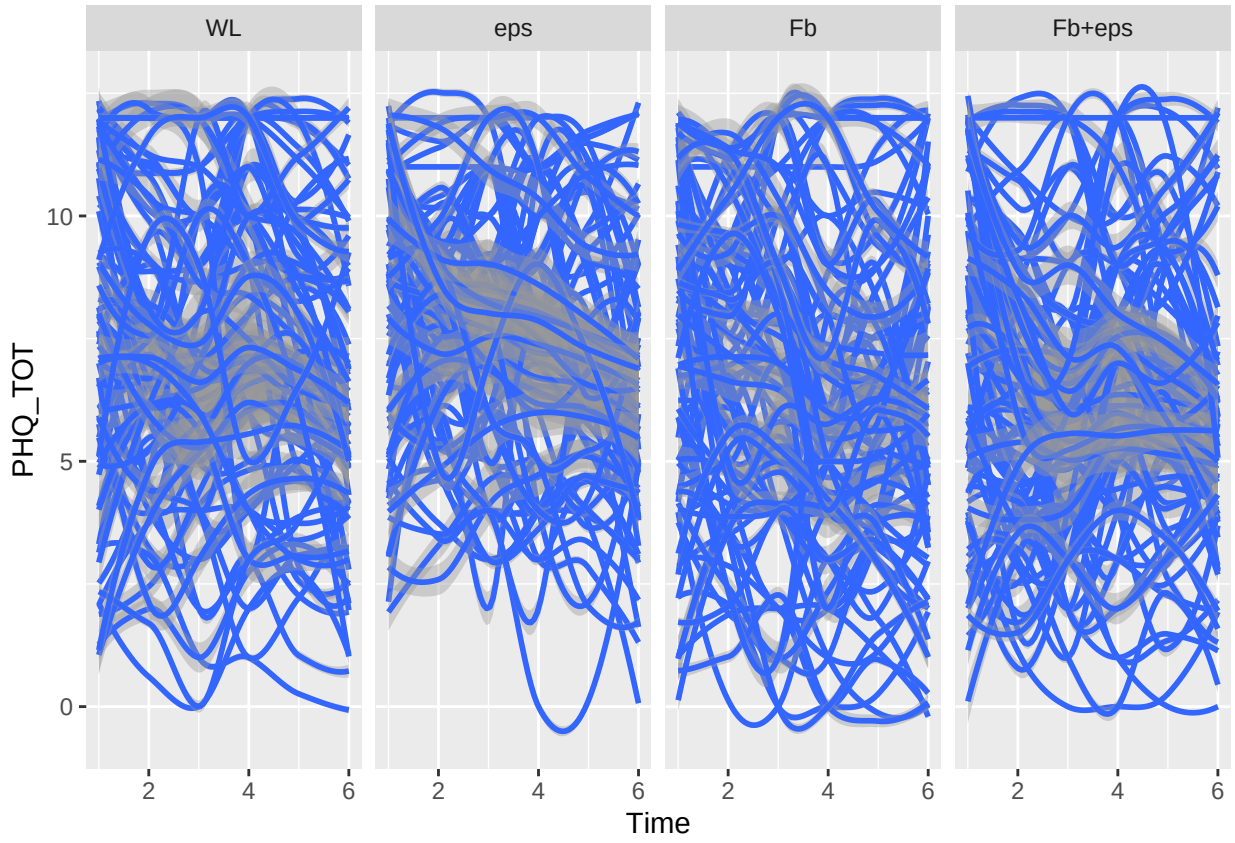
```r
data <- data[!is.na(data$T0_BMI), ]
data <- data[!is.na(data$T0_EDEQ_TOT), ]
data <- data[!is.na(data$T0_edu), ]
data <- data[!is.na(data$T0_yrsED), ]
unlist(sapply(data[ , c("Age", "T0_edu", "T0_BMI", "T0_EDEQ_TOT", "T0_Motiv_TOT",
                        "T0_GSES_TOT", "T0_PHQ_TOT")], function(x) table(is.na(x))))
```

```
##          Age.FALSE       T0_edu.FALSE       T0_BMI.FALSE  T0_EDEQ_TOT.FALSE
##             215058             215058             215058             215058
## T0_Motiv_TOT.FALSE  T0_Motiv_TOT.TRUE  T0_GSES_TOT.FALSE   T0_PHQ_TOT.FALSE
##             215043                 15             215058             215058
```

```r
## Exploratory plot
library("ggplot2")
ggplot(data = data, aes(x = Time, y = PHQ_TOT, group = ID)) +
  facet_grid(. ~ Condition) + geom_smooth()
```

```
## `geom_smooth()` using method = 'loess' and formula 'y ~ x'
```

```
## Warning: Removed 477 rows containing non-finite values (stat_smooth).
```



De trajecten lijken niet erg lineair.

Splits based only on treatment-time-subgroup interactions

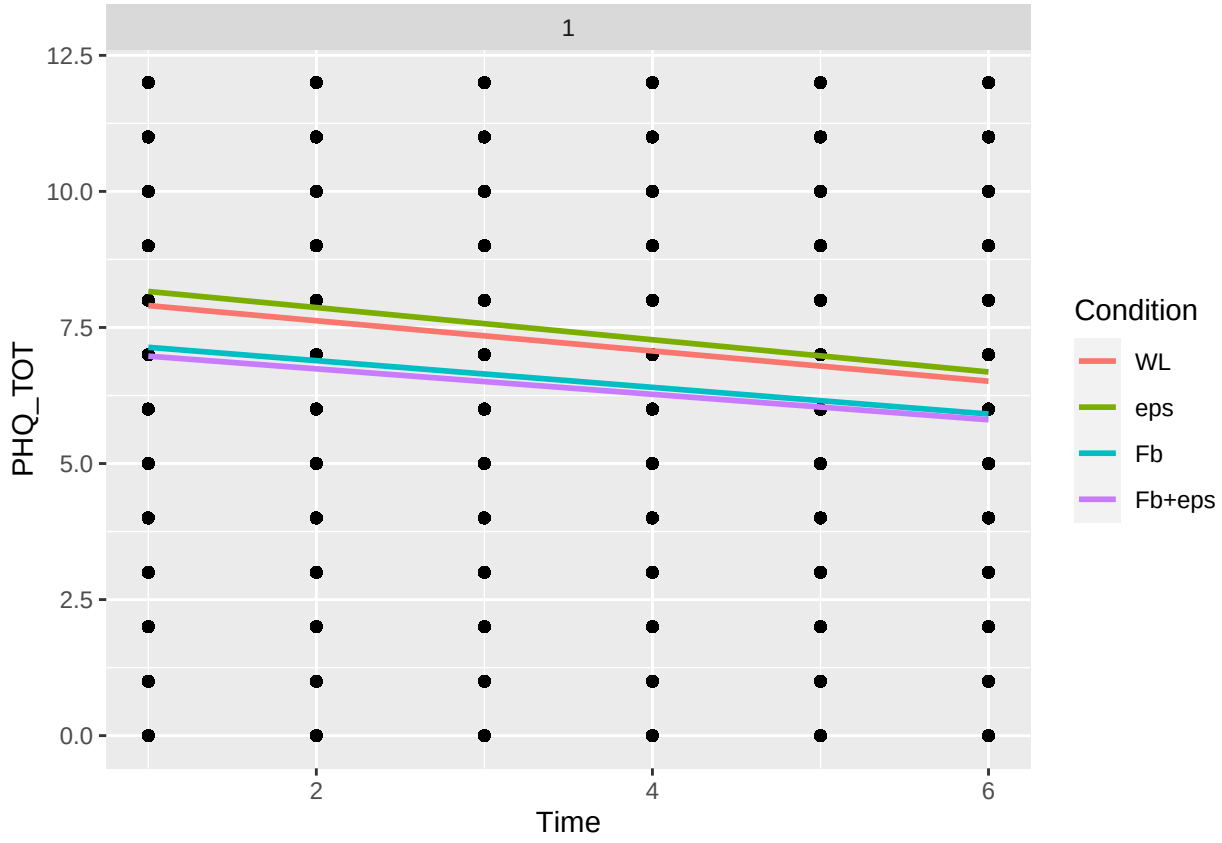
```
library("glmertree")
library("lmerTest")
library("strucchange")
dat1 <- data[!is.na(data$PHQ_TOT),]
lt1 <- lmertree(PHQ_TOT ~ Time*Condition | (1|ID) | Age + T0_edu + T0_BMI + T0_EDEQ_TOT +
                  T0_Motiv_TOT + T0_GSES_TOT + T0_PHQ_TOT + T0_treatment +  T0_yrsED +
                  T0_SSL_TOT + T0_eetbuien,
                data = dat1, cluster = ID, parm = 6:8)
if (length(lt1$tree) > 1L) {
  plot(lt1, which = "tree", fitted = "marginal", gp = gpar(cex = .5))
  #fixef(lt1)
  apply(fixef(lt1), 2, sd)
  VarCorr(lt1)
  tmp <- summary(lmer(attr(lt1$lmer, "call")$formula, data = lt1$data))
  round(tmp$coefficients[tmp$coefficients[,"Pr(>|t|)"] < 0.05, -3], digits = 4)
} else {
  sctest(lt1$tree)
}
```

```
##                Age     T0_edu    T0_BMI T0_EDEQ_TOT T0_Motiv_TOT T0_GSES_TOT
```

```
## statistic 5.501296 22.3922270 5.9747359    3.704816     5.124871    3.881059
## p.value   1.000000  0.9998674 0.9999996    1.000000     1.000000    1.000000
##           T0_PHQ_TOT T0_treatment  T0_yrsED T0_SSL_TOT T0_eetbuien
## statistic  6.8747576    7.8146840 9.0920960 12.9439134    4.187099
## p.value    0.9999682    0.4312064 0.9889012  0.6453678    1.000000
```

```
ggplot(data = lt1$data, aes(x = Time, y = PHQ_TOT, group = ID)) + geom_point() +
  facet_grid(. ~ .tree) + geom_smooth(method = "lm", se = FALSE,
aes(x = Time, y = PHQ_TOT, group = Condition, color = Condition))
```

```
## `geom_smooth()` using formula 'y ~ x'
```

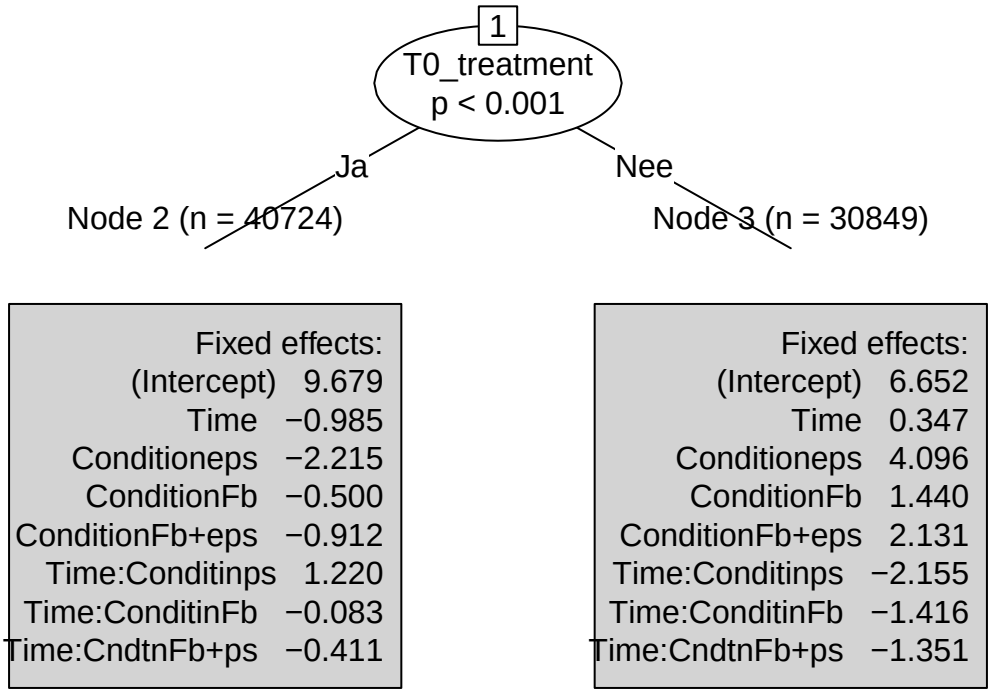



```
dat2 <- dat1[dat1$Time %in% 1:2, ]
lt3 <- lmertree(PHQ_TOT ~ Time*Condition | (1|ID) | Age + T0_edu + T0_BMI + T0_EDEQ_TOT +
                  T0_Motiv_TOT + T0_GSES_TOT + T0_PHQ_TOT + T0_treatment + T0_yrsED +
                  T0_SSL_TOT + T0_eetbuien,
                data = dat2, cluster = ID, parm = 6:8)
```

```
## Warning in lmertree(PHQ_TOT ~ Time * Condition | (1 | ID) | Age + T0_edu + :
## 'data' contains missing values, note that listwise deletion will be employed.
```

```
if (length(lt3$tree) > 1L) {
  plot(lt3, which = "tree", type = "simple", fitted = "marginal", gp = gpar(cex = .7))
  #fixef(lt3)
  apply(fixef(lt3), 2, sd)
  VarCorr(lt3)
  tmp <- summary(lmer(attr(lt3$lmer, "call")$formula, data = lt3$data))
  round(tmp$coefficients[tmp$coefficients[,"Pr(>|t|)"] < 0.05, -3], digits = 4)
```

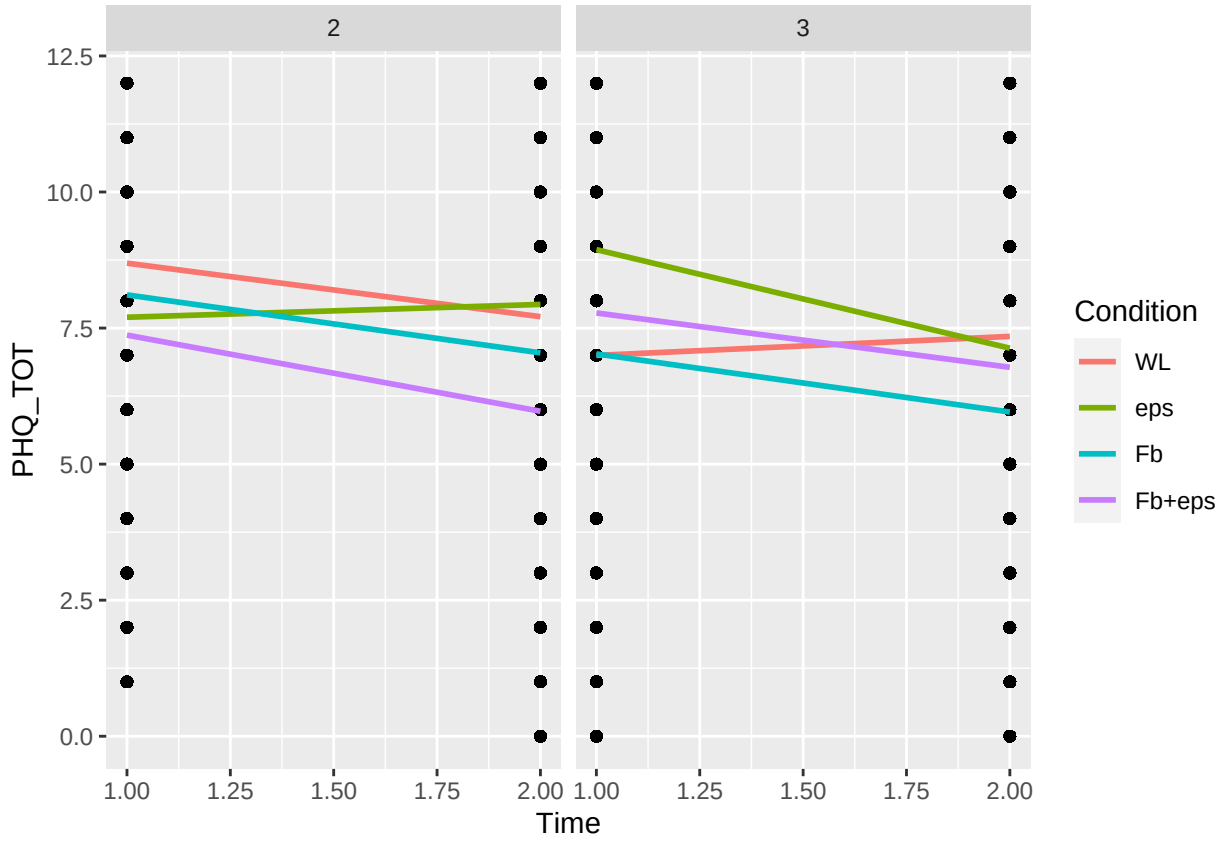
```
} else {
  sctest(lt3$tree)
}
```




```
##                              Estimate Std. Error  t value Pr(>|t|)
## (Intercept)                    9.6790     0.3904  24.7957   0.0000
## .tree3                        -3.0268     0.5783  -5.2336   0.0000
## .tree2:Time                   -0.9856     0.0321 -30.6770   0.0000
## .tree3:Time                    0.3470     0.0351   9.8823   0.0000
## .tree2:Conditioneps           -2.2159     0.5415  -4.0920   0.0001
## .tree3:Conditioneps            4.0987     0.6338   6.4669   0.0000
## .tree3:ConditionFb             1.4405     0.5999   2.4012   0.0168
## .tree3:ConditionFb+eps         2.1251     0.6241   3.4052   0.0007
## .tree2:Time:Conditioneps       1.2209     0.0446  27.3963   0.0000
## .tree3:Time:Conditioneps      -2.1567     0.0521 -41.3577   0.0000
## .tree3:Time:ConditionFb       -1.4159     0.0494 -28.6866   0.0000
## .tree2:Time:ConditionFb+eps   -0.4123     0.0444  -9.2951   0.0000
## .tree3:Time:ConditionFb+eps   -1.3466     0.0514 -26.2193   0.0000
```

```
ggplot(data = lt3$data, aes(x = Time, y = PHQ_TOT, group = ID)) + geom_point() +
  facet_grid(. ~ .tree) +
  geom_smooth(method = "lm", se = FALSE,
              aes(x = Time, y = PHQ_TOT, group = Condition, color = Condition))
```

```
## `geom_smooth()` using formula 'y ~ x'
```



Waitlist versus all treatment groups

```
dat1$Condition2 <- factor(dat1$Condition == "WL")
lt2 <- lmertree(PHQ_TOT ~ Time*Condition2 | (1|ID) | Age + T0_edu + T0_BMI + T0_EDEQ_TOT +
                  T0_Motiv_TOT + T0_GSES_TOT + T0_PHQ_TOT + T0_treatment +  T0_yrsED +
                  T0_SSL_TOT + T0_eetbuien,
                data = dat1, cluster = ID, parm = 4, verbose = TRUE, maxdepth = 4)
```

```
## 'log Lik.' -472211.1 (df=6)
## 'log Lik.' -472211.1 (df=6)
```

```
if (length(lt2$tree) > 1L) {
  plot(lt2, which = "tree", fitted = "marginal", gp = gpar(cex = .5))
  #fixef(lt2)
  apply(fixef(lt2), 2, sd)
  VarCorr(lt2)
  tmp <- summary(lmer(attr(lt2$lmer, "call")$formula, data = lt1$data))
  round(tmp$coefficients[tmp$coefficients[,"Pr(>|t|)"] < 0.05, -3], digits = 4)
} else {
  sctest(lt2$tree)
}
```

```
##                 Age    T0_edu   T0_BMI T0_EDEQ_TOT T0_Motiv_TOT T0_GSES_TOT
## statistic 2.8231826 8.5429341 1.647902     1.54926    3.9387850    3.422081
## p.value   0.9999939 0.9950053 1.000000     1.00000    0.9984789    0.999804
##           T0_PHQ_TOT T0_treatment T0_yrsED T0_SSL_TOT T0_eetbuien
```

```
## statistic  4.4193402    6.2313699  1.28882  3.7812250    1.852299
## p.value    0.9937755    0.1297119  1.00000  0.9991278    1.000000
```

```
dat2 <- dat1[dat1$Time %in% 1:2, ]
lt4 <- lmertree(PHQ_TOT ~ Time*Condition2 | (1|ID) | Age + T0_edu + T0_BMI + T0_EDEQ_TOT +
                  T0_Motiv_TOT + T0_GSES_TOT + T0_PHQ_TOT + T0_treatment + T0_yrsED +
                  T0_SSL_TOT + T0_eetbuien,
                data = dat2, cluster = ID, parm = 4, maxdepth = 4)
if (length(lt4$tree) > 1L) {
  plot(lt4, which = "tree", fitted = "marginal", gp = gpar(cex = .7))
  #fixef(lt4)
  apply(fixef(lt4), 2, sd)
  VarCorr(lt4)
  tmp <- summary(lmer(attr(lt4$lmer, "call")$formula, data = lt3$data))
  round(tmp$coefficients[tmp$coefficients[,"Pr(>|t|)"] < 0.05, -3], digits = 4)
} else {
  sctest(lt4$tree)
}
```

```
##                  Age   T0_edu    T0_BMI T0_EDEQ_TOT T0_Motiv_TOT T0_GSES_TOT
## statistic 4.3853843 4.212643 3.5113754    2.240749     1.893448   4.1582003
## p.value   0.9942949 1.000000 0.9997063    1.000000     1.000000   0.9969604
##           T0_PHQ_TOT T0_treatment  T0_yrsED T0_SSL_TOT T0_eetbuien
## statistic  5.2884318   7.63052874 3.0496848  6.2082979   3.7344621
## p.value    0.9636033   0.06134676 0.9999729  0.8816751   0.9992681
```