Featback analyses: GSES

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
```

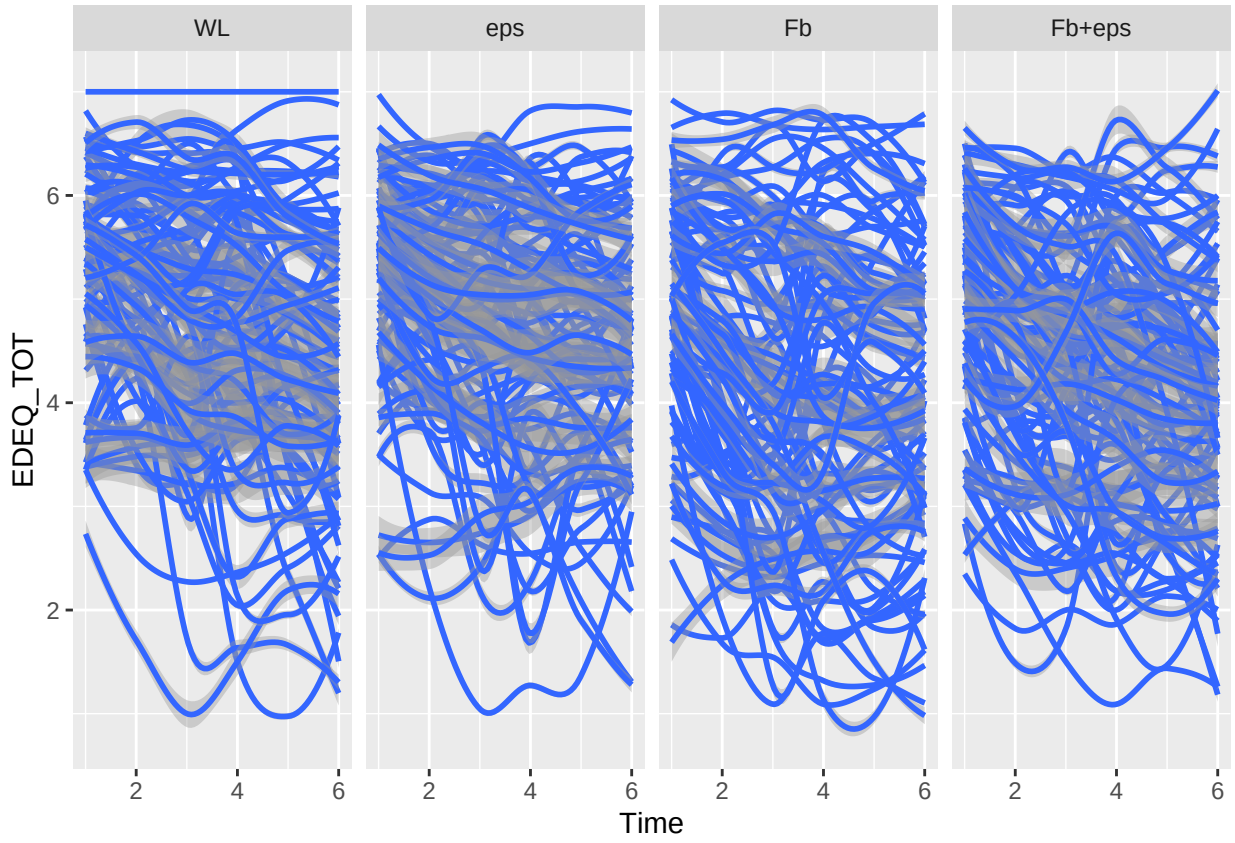
```r
data <- data[!is.na(data$T0_BMI), ]
data <- data[!is.na(data$T0_EDEQ_TOT), ]
data <- data[!is.na(data$T0_edu), ]
data <- data[!is.na(data$T0_yrsED), ]
unlist(sapply(data[ , c("Age", "T0_edu", "T0_BMI", "T0_EDEQ_TOT", "T0_Motiv_TOT",
                        "T0_GSES_TOT", "T0_PHQ_TOT")], function(x) 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 = EDEQ_TOT, group = ID)) +
  facet_grid(. ~ Condition) + geom_smooth()
```

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

```
## Warning: Removed 502 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")

dim(data)
```

```
## [1] 215058     70
```

```
dat1 <- data[!is.na(data$GSES_TOT),]
dim(dat1)
```

```
## [1] 214549     70
```

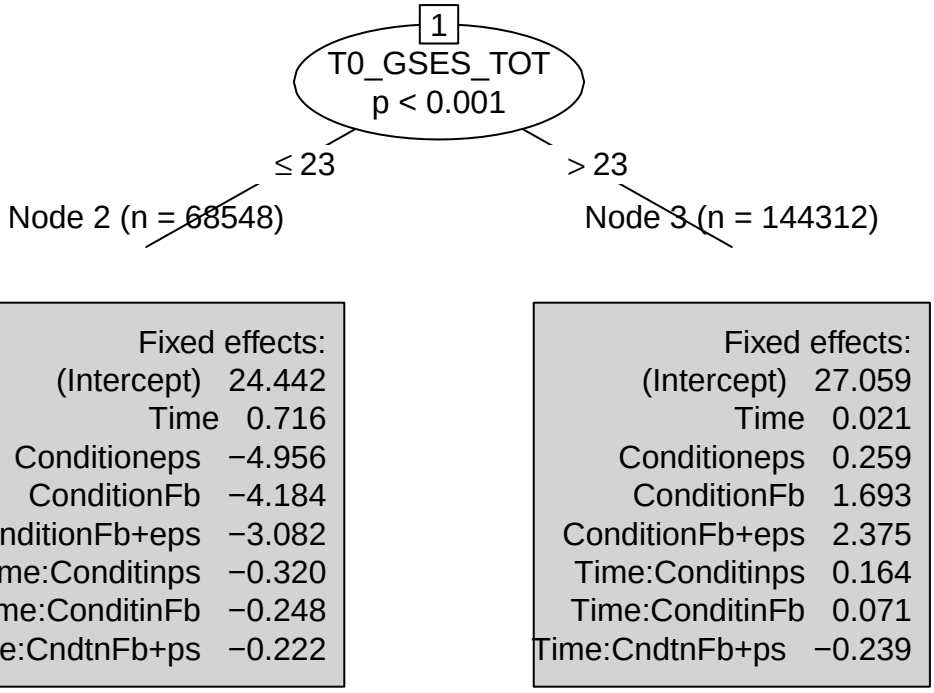
```
## Weird: still some missing values
## Seem to occur when imputation_ is 0
## table(dat1$ID, dat1$Imputation_)[ , 1] ## not all sixes
## table(dat1$ID, dat1$Imputation_)[ , 2] ## all sixes
dat1 <- dat1[dat1$Imputation_ != 0, ]
dim(dat1)
```

```
## [1] 212980     70
```

```
lt1 <- lmertree(GSES_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, maxdepth = 4, verbose = TRUE)
```

```
## 'log Lik.' -567916.8 (df=18)
## 'log Lik.' -567916.8 (df=18)
```

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

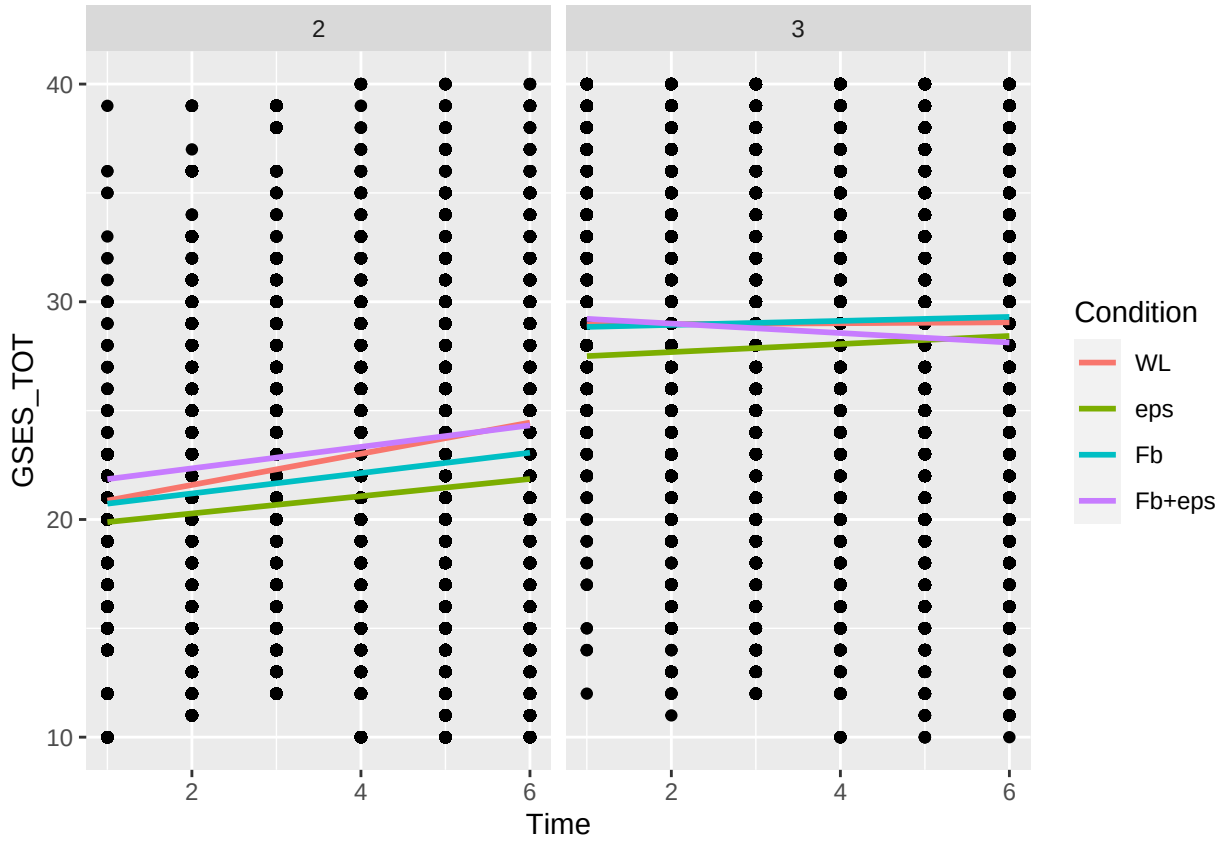



```
##                            Estimate Std. Error  t value Pr(>|t|)
## (Intercept)                 24.4421     0.4234  57.7235   0.0000
## .tree3                       2.6167     0.1826  14.3275   0.0000
## .tree2:Time                  0.7161     0.0158  45.2135   0.0000
## .tree3:Time                  0.0213     0.0105   2.0404   0.0413
## .tree2:Conditioneps         -4.9583     0.7590  -6.5327   0.0000
## .tree2:ConditionFb          -4.1844     0.8388  -4.9885   0.0000
## .tree3:ConditionFb           1.6941     0.6410   2.6429   0.0086
```

```
## .tree2:ConditionFb+eps       -3.0821     0.9201  -3.3497   0.0009
## .tree3:ConditionFb+eps        2.3761     0.6181   3.8439   0.0001
## .tree2:Time:Conditioneps     -0.3199     0.0209 -15.3194   0.0000
## .tree3:Time:Conditioneps      0.1639     0.0157  10.4425   0.0000
## .tree2:Time:ConditionFb      -0.2478     0.0223 -11.1336   0.0000
## .tree3:Time:ConditionFb       0.0708     0.0150   4.7360   0.0000
## .tree2:Time:ConditionFb+eps  -0.2221     0.0237  -9.3677   0.0000
## .tree3:Time:ConditionFb+eps  -0.2390     0.0145 -16.4870   0.0000
```

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

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




```
dat2 <- dat1[dat1$Time %in% 1:2, ]
lt3 <- lmertree(GSES_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, maxdepth = 4, verbose = TRUE)
```

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

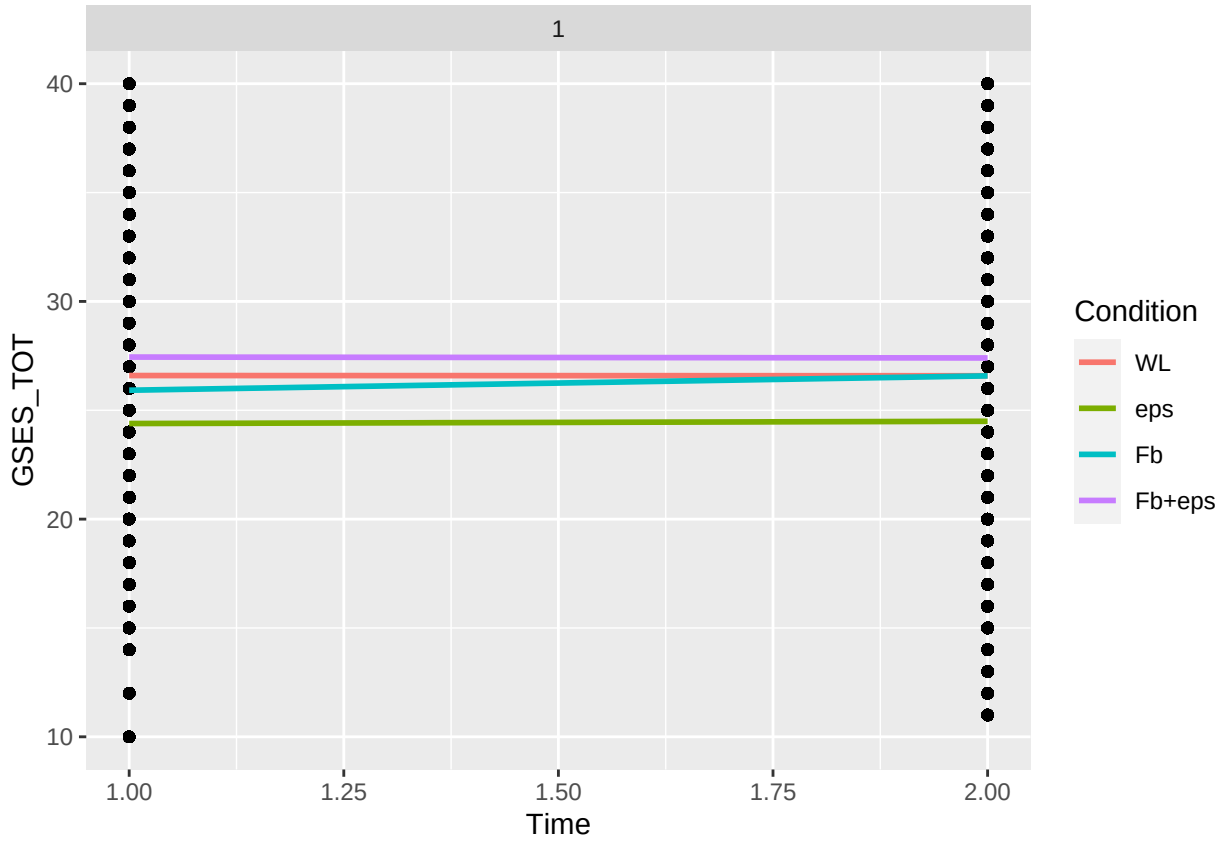
```
## 'log Lik.' -169525.9 (df=10)
## 'log Lik.' -169525.9 (df=10)
```

```
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)
}
```

```
##                Age    T0_edu   T0_BMI T0_EDEQ_TOT T0_Motiv_TOT T0_GSES_TOT
## statistic 3.424619 11.94041 7.346604   6.9026259    6.3652566  10.7539192
## p.value   1.000000  1.00000 0.999826   0.9999645    0.9999967   0.9101576
##           T0_PHQ_TOT T0_treatment   T0_yrsED T0_SSL_TOT T0_eetbuien
## statistic  8.3151584    1.8172927 12.0804496 10.1861647    4.527186
## p.value    0.9975622    0.9999693  0.7655654  0.9495224    1.000000
```

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

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



Waitlist versus all treatment groups

```
dat1$Condition2 <- factor(dat1$Condition == "WL")
lt2 <- lmertree(GSES_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.' -569881.2 (df=6)
## 'log Lik.' -569881.2 (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 0.9517267 2.586386 2.219938   2.4330414     1.323522 13.12622010
## p.value   1.0000000 1.000000 1.000000   0.9999998     1.000000  0.07800239
##           T0_PHQ_TOT T0_treatment T0_yrsED T0_SSL_TOT T0_eetbuien
## statistic  7.5711516    2.0331237 2.598200  6.9862055    2.085639
## p.value    0.6748673    0.8409198 0.999999  0.7720581    1.000000
```

```
dat2 <- dat1[dat1$Time %in% 1:2, ]
lt4 <- lmertree(GSES_TOT ~ Time*Condition2 | (1|ID) | Age + T0_edu + T0_BMI + T0_EDEQ_TOT +
                  T0_Motiv_TOT + T0_GSES_TOT + T0_PHQ_TOT + T0_treatment + T0_yrsED +
                  T0_SSL_TOT + T0_eetbuien,
                data = dat2, cluster = ID, parm = 4, maxdepth = 4)
if (length(lt4$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 6.3555508 3.776758 2.7211261   0.9556429    7.8818450   3.0014419
## p.value   0.8633832 1.000000 0.9999972   1.0000000    0.6213518   0.9999799
##           T0_PHQ_TOT T0_treatment  T0_yrsED T0_SSL_TOT T0_eetbuien
## statistic  0.8198438  0.005647743 5.2778893  2.9712962   4.3108138
## p.value    1.0000000  1.000000000 0.9642137  0.9999834   0.9953185
```