

```
## Call:
## lm(formula = SES1 ~ age + SEX + dc.att + dc.id, data = mac.nocontrols)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -4.8158 -1.5880 -0.1034  2.1258  5.2481
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  10.88745    2.00651   5.426 3.37e-07 ***
## age          -0.08620    0.02915  -2.957  0.00379 **
## SEXMALE      -0.35161    0.42254  -0.832  0.40711
## dc.att        1.88285    0.49290   3.820  0.00022 ***
## dc.id         1.18776    0.56458   2.104  0.03763 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 2.274 on 112 degrees of freedom
## Multiple R-squared:  0.1935, Adjusted R-squared:  0.1647
## F-statistic: 6.718 on 4 and 112 DF,  p-value: 6.97e-05

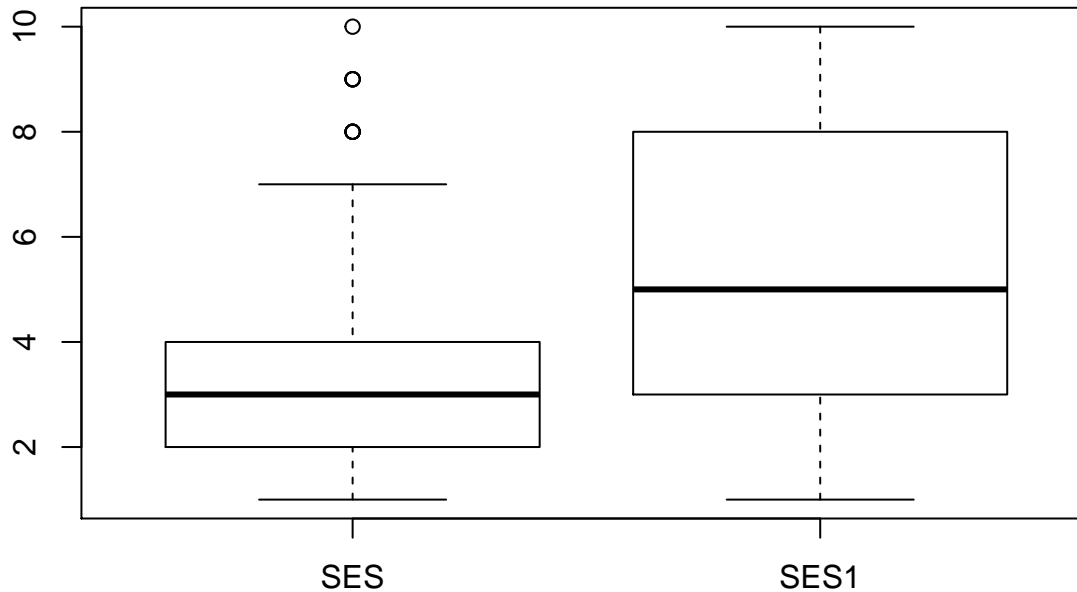
library(reshape)

##
## Attaching package: 'reshape'

## The following objects are masked from 'package:plyr':
##
##      rename, round_any

## The following object is masked from 'package:Matrix':
##
##      expand

#id.vars = names(m)
#grep("SES", id.vars)
#grep("SES1", id.vars)
#id.vars = id.vars[-grep("SES") & -grep("SES1"),]
m = melt(mac, na.rm = FALSE, measure.vars = c("SES", "SES1"), value.name = c("SES"))
plot(m$variable, m$value)
```



```
m$SES <- m$value
m$time[m$variable == "SES1"] <- "current"
m$time[m$variable == "SES"] <- "high"
m$grp_leth[m$GROUP12467 == 1] <- "HC"
m$grp_leth[m$GROUP12467 == 2] <- "DC"
m$grp_leth[m$GROUP12467 == 4] <- "I"
m$grp_leth[m$GROUP12467 == 6] <- "LL"
m$grp_leth[m$GROUP12467 == 7] <- "HL"

# full demo predictors
summary(m1 <- lmer(SES ~ edu*time + age*time + INCOMEcst*time + SEX*time
  + RACE*time+ (1|ID), data = m, na.omit = TRUE))
```

```
## Warning: extra argument(s) 'na.omit' disregarded
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## Linear mixed model fit by REML t-tests use Satterthwaite approximations
## to degrees of freedom [lmerMod]
## Formula: SES ~ edu * time + age * time + INCOMEcst * time + SEX * time +
## RACE * time + (1 | ID)
## Data: m
##
## REML criterion at convergence: 1344.1
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -2.14293 -0.52145 -0.02326  0.46685  2.21872
##
## Random effects:
## Groups Name Variance Std.Dev.
## ID (Intercept) 2.292 1.514
## Residual 2.076 1.441
## Number of obs: 322, groups: ID, 161
##
## Fixed effects:
##              Estimate Std. Error      df t value Pr(>|t|)
## (Intercept) 12.67134 1.99803 241.49000 6.342 1.11e-09
## edu -0.11291 0.06685 241.49000 -1.689 0.092518
## timehigh -4.45566 1.94789 154.00000 -2.287 0.023532
## age -0.09612 0.02257 241.49000 -4.259 2.94e-05
## INCOMEcst -0.99426 0.18807 241.49000 -5.287 2.79e-07
## SEXMALE 0.07402 0.33650 241.49000 0.220 0.826086
## RACEASIAN PACIFIC -0.75137 2.16270 241.49000 -0.347 0.728576
## RACEWHITE 1.01205 0.47177 241.49000 2.145 0.032932
## edu:timehigh -0.05913 0.06518 154.00000 -0.907 0.365673
## timehigh:age 0.05808 0.02200 154.00000 2.640 0.009151
## timehigh:INCOMEcst 0.62294 0.18335 154.00000 3.398 0.000865
## timehigh:SEXMALE -0.13072 0.32806 154.00000 -0.398 0.690837
## timehigh:RACEASIAN PACIFIC 1.03171 2.10843 154.00000 0.489 0.625306
## timehigh:RACEWHITE -0.73684 0.45993 154.00000 -1.602 0.111185
##
## (Intercept) ***
## edu .
## timehigh *
## age ***
## INCOMEcst ***
## SEXMALE
## RACEASIAN PACIFIC
## RACEWHITE *
## edu:timehigh

```

```

## timehigh:age          **
## timehigh:INCOMEcst    ***
## timehigh:SEXMALE
## timehigh:RACEASIAN PACIFIC
## timehigh:RACEWHITE
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

##
## Correlation matrix not shown by default, as p = 14 > 12.
## Use print(x, correlation=TRUE) or
##   vcov(x)      if you need it

# demo predictors + group
summary(m2 <- lmer(SSES ~ edu*time + age*time + INCOMEcst*time + SEX*time
  + RACE*time + grp_leth*time + (1|ID), data = m))

## Linear mixed model fit by REML t-tests use Satterthwaite approximations
##   to degrees of freedom [lmerMod]
## Formula: SSES ~ edu * time + age * time + INCOMEcst * time + SEX * time +
##   RACE * time + grp_leth * time + (1 | ID)
##   Data: m
##
## REML criterion at convergence: 1311.2
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -2.34455 -0.48910 -0.06223  0.48330  1.98210
##
## Random effects:
##   Groups   Name                Variance Std.Dev.
##   ID       (Intercept)  2.324      1.524
##   Residual                    1.831      1.353
## Number of obs: 322, groups:  ID, 161
##
## Fixed effects:
##              Estimate Std. Error      df t value Pr(>|t|)
## (Intercept)    10.33252    2.02705 228.52000    5.097 7.22e-07
## edu             -0.05742    0.06732 228.52000   -0.853 0.394571
## timehigh       -2.43362    1.90307 150.00000   -1.279 0.202947
## age            -0.07407    0.02301 228.52000   -3.220 0.001469
## INCOMEcst      -0.73289    0.19719 228.52000   -3.717 0.000254
## SEXMALE        -0.05801    0.33496 228.52000   -0.173 0.862664
## RACEASIAN PACIFIC -1.61042    2.17438 228.52000   -0.741 0.459675
## RACEWHITE        0.58786    0.47787 228.52000    1.230 0.219906
## grp_lethHC      -0.50894    0.47557 228.52000   -1.070 0.285676
## grp_lethHL       1.52567    0.58679 228.52000    2.600 0.009929
## grp_lethI        0.83249    0.51780 228.52000    1.608 0.109276
## grp_lethLL       1.60275    0.52053 228.52000    3.079 0.002331
## edu:timehigh    -0.12018    0.06320 150.00000   -1.902 0.059147
## timehigh:age     0.03728    0.02160 150.00000    1.726 0.086427
## timehigh:INCOMEcst 0.31733    0.18513 150.00000    1.714 0.088578
## timehigh:SEXMALE  0.07592    0.31447 150.00000    0.241 0.809556
## timehigh:RACEASIAN PACIFIC 2.02407    2.04139 150.00000    0.992 0.323029
## timehigh:RACEWHITE -0.23279    0.44864 150.00000   -0.519 0.604618

```

```

## timehigh:grp_lethHC          0.89877    0.44649 150.00000    2.013 0.045905
## timehigh:grp_lethHL         -1.45787    0.55090 150.00000   -2.646 0.009005
## timehigh:grp_lethI          -0.87278    0.48613 150.00000   -1.795 0.074610
## timehigh:grp_lethLL         -1.02964    0.48870 150.00000   -2.107 0.036788
##
## (Intercept)                  ***
## edu
## timehigh
## age                          **
## INCOMEcst                    ***
## SEXMALE
## RACEASIAN PACIFIC
## RACEWHITE
## grp_lethHC
## grp_lethHL                  **
## grp_lethI
## grp_lethLL                  **
## edu:timehigh                 .
## timehigh:age                 .
## timehigh:INCOMEcst           .
## timehigh:SEXMALE
## timehigh:RACEASIAN PACIFIC
## timehigh:RACEWHITE
## timehigh:grp_lethHC          *
## timehigh:grp_lethHL          **
## timehigh:grp_lethI           .
## timehigh:grp_lethLL          *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

##
## Correlation matrix not shown by default, as p = 22 > 12.
## Use print(x, correlation=TRUE) or
##   vcov(x)      if you need it

```

```
car::Anova(m2)
```

```

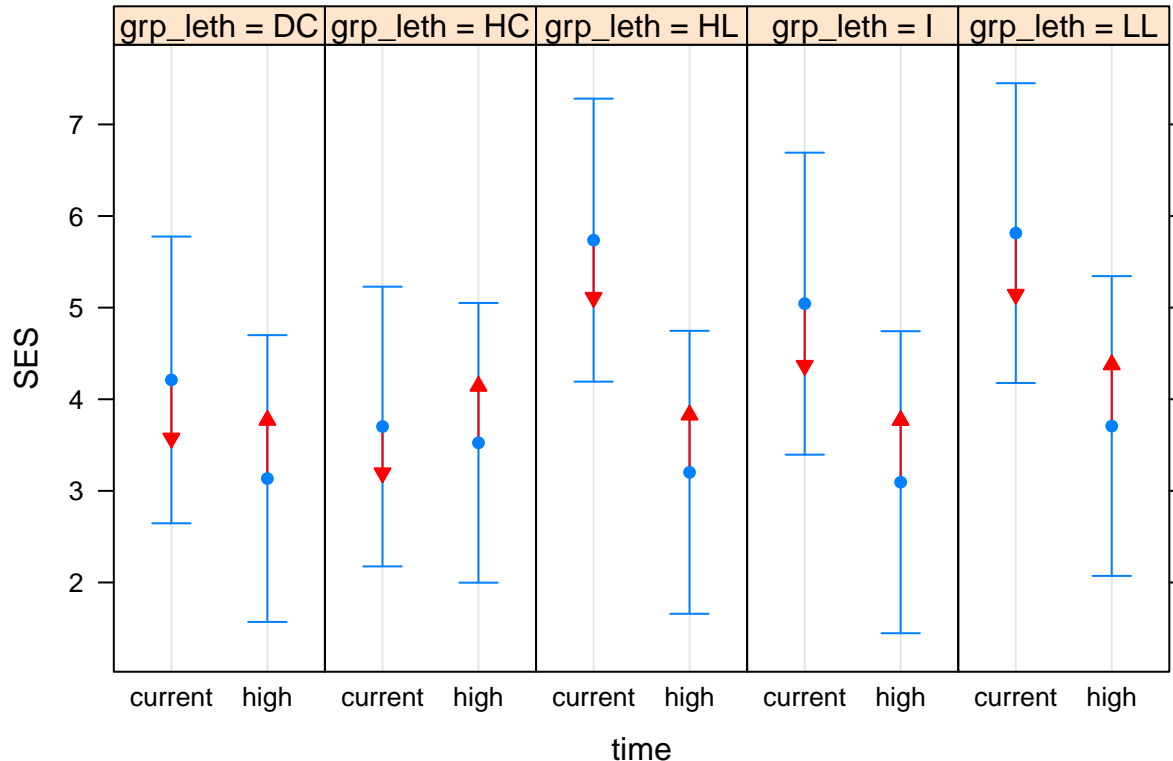
## Analysis of Deviance Table (Type II Wald chisquare tests)
##
## Response: SES
##
##           Chisq Df Pr(>Chisq)
## edu           3.9083 1  0.048048 *
## time        201.8806 1 < 2.2e-16 ***
## age           7.4481 1  0.006350 **
## INCOMEcst    10.8763 1  0.000974 ***
## SEX           0.0046 1  0.945959
## RACE          1.5301 2  0.465317
## grp_leth      8.3292 4  0.080236 .
## edu:time       3.6159 1  0.057230 .
## time:age       2.9787 1  0.084368 .
## time:INCOMEcst 2.9381 1  0.086513 .
## time:SEX       0.0583 1  0.809227
## time:RACE      1.4981 2  0.472827
## time:grp_leth 24.5927 4 6.074e-05 ***
## ---

```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
anova(m1,m2)

## refitting model(s) with ML (instead of REML)

## Data: m
## Models:
## object: SES ~ edu * time + age * time + INCOMEcst * time + SEX * time +
## object:      RACE * time + (1 | ID)
## ..1: SES ~ edu * time + age * time + INCOMEcst * time + SEX * time +
## ..1:      RACE * time + grp_leth * time + (1 | ID)
##      Df    AIC    BIC logLik deviance  Chisq Chi Df Pr(>Chisq)
## object 16 1354.4 1414.8 -661.18   1322.4
## ..1    24 1337.2 1427.8 -644.61   1289.2 33.144     8 5.802e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
ls2 <- lsmeans(m2, "time", by = "grp_leth")
plot(ls2, type ~ SES, horiz=F, ylab = "SES", xlab = "time", comparisons = TRUE)
```



```
# diff impact of education
#summary(m3 <- lmer(SES ~ edu*time + age*time + INCOMEcst*time + SEX*time
#                  + RACE*time + grp_leth*time*edu + (1|ID), data = m))
#car::Anova(m3)
#anova(m2,m3)
#ls3 <- lsmeans(m3, "time", by = c("grp_leth", "edu"), at=list(edu = c(8,17)))
#plot(ls3, type ~ SES, horiz=F, ylab = "SES", xlab = "time", comparisons = TRUE, alpha = 0.05)

summary(m4 <- lmer(SES ~ edu*time + age*time + INCOMEcst*time + SEX*time
                  + RACE*time + REGRETSUBSCALE*time + (1|ID), data = m))
```

```

## Linear mixed model fit by REML t-tests use Satterthwaite approximations
##   to degrees of freedom [lmerMod]
## Formula: SES ~ edu * time + age * time + INCOMEcst * time + SEX * time +
##   RACE * time + REGRETSUBSCALE * time + (1 | ID)
##   Data: m
##
## REML criterion at convergence: 1252.3
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -2.01940 -0.51917 -0.02759  0.44639  2.06204
##
## Random effects:
##   Groups   Name                Variance Std.Dev.
##   ID       (Intercept) 2.233      1.494
##   Residual                2.038      1.428
## Number of obs: 300, groups: ID, 150
##
## Fixed effects:
##
##              Estimate Std. Error      df t value Pr(>|t|)
## (Intercept)      9.94207    2.30495 223.04000    4.313 2.42e-05
## edu             -0.10583    0.06868 223.04000   -1.541 0.12478
## timehigh        -1.88559    2.25184 142.00000   -0.837 0.40380
## age             -0.08073    0.02410 223.04000   -3.350 0.00095
## INCOMEcst       -0.91994    0.19509 223.04000   -4.716 4.25e-06
## SEXMALE         0.10151    0.35468 223.04000    0.286 0.77499
## RACEASIAN PACIFIC -1.51830    2.15695 223.04000   -0.704 0.48222
## RACEWHITE        0.51336    0.50685 223.04000    1.013 0.31223
## REGRETSUBSCALE   0.14289    0.04855 223.04000    2.943 0.00359
## edu:timehigh     -0.06995    0.06710 142.00000   -1.043 0.29894
## timehigh:age      0.04591    0.02355 142.00000    1.950 0.05315
## timehigh:INCOMEcst 0.54282    0.19059 142.00000    2.848 0.00505
## timehigh:SEXMALE -0.06466    0.34651 142.00000   -0.187 0.85225
## timehigh:RACEASIAN PACIFIC 1.69705    2.10725 142.00000    0.805 0.42197
## timehigh:RACEWHITE -0.27003    0.49517 142.00000   -0.545 0.58638
## timehigh:REGRETSUBSCALE -0.14097    0.04743 142.00000   -2.972 0.00348
##
## (Intercept)      ***
## edu
## timehigh
## age              ***
## INCOMEcst        ***
## SEXMALE
## RACEASIAN PACIFIC
## RACEWHITE
## REGRETSUBSCALE   **
## edu:timehigh
## timehigh:age      .
## timehigh:INCOMEcst **
## timehigh:SEXMALE
## timehigh:RACEASIAN PACIFIC
## timehigh:RACEWHITE
## timehigh:REGRETSUBSCALE **
## ---

```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
##
```

```
## Correlation matrix not shown by default, as p = 16 > 12.
```

```
## Use print(x, correlation=TRUE) or
```

```
## vcov(x) if you need it
```

```
car::Anova(m4)
```

```
## Analysis of Deviance Table (Type II Wald chisquare tests)
```

```
##
```

```
## Response: SES
```

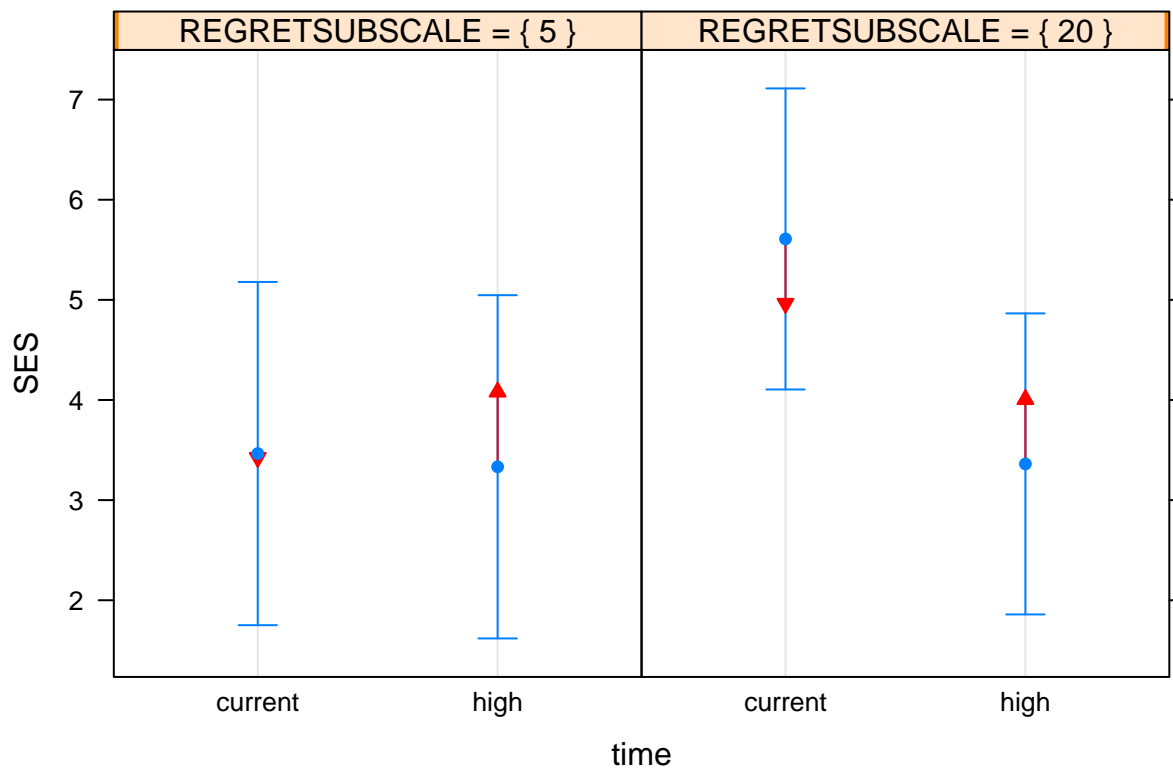
	Chisq	Df	Pr(>Chisq)
edu	5.5198	1	0.0188019 *
time	181.3676	1	< 2.2e-16 ***
age	7.5476	1	0.0060091 **
INCOMEcst	14.5142	1	0.0001391 ***
SEX	0.0500	1	0.8231198
RACE	1.0124	2	0.6027780
REGRETSUBSCALE	2.9208	1	0.0874431 .
edu:time	1.0868	1	0.2971723
time:age	3.8023	1	0.0511835 .
time:INCOMEcst	8.1114	1	0.0043988 **
time:SEX	0.0348	1	0.8519788
time:RACE	1.1569	2	0.5607804
time:REGRETSUBSCALE	8.8320	1	0.0029600 **

```
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
ls4 <- lsmeans(m4, "time", by = c("REGRETSUBSCALE"), at=list(REGRETSUBSCALE = c(5,20)))
```

```
plot(ls4, type ~ SES, horiz=F, ylab = "SES", xlab = "time", comparisons = TRUE, alpha = 0.05)
```




```
summary(m5 <- lmer(SES ~ edu*time + age*time + INCOMEcst*time + SEX*time
+ RACE*time + neurotic*time + (1|ID), data = m))

## Linear mixed model fit by REML t-tests use Satterthwaite approximations
## to degrees of freedom [lmerMod]
## Formula: SES ~ edu * time + age * time + INCOMEcst * time + SEX * time +
## RACE * time + neurotic * time + (1 | ID)
## Data: m
##
## REML criterion at convergence: 950.9
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -1.81649 -0.51402 -0.04323  0.49906  2.37703
##
## Random effects:
## Groups   Name                Variance Std.Dev.
## ID       (Intercept)  2.078      1.441
## Residual                    1.938      1.392
## Number of obs: 230, groups: ID, 115
##
## Fixed effects:
##              Estimate Std. Error    df t value Pr(>|t|)
## (Intercept)      7.68818    2.55337 168.81000   3.011  0.0030
## edu              -0.07561    0.07908 168.81000  -0.956  0.3404
## timehigh         -0.93280    2.50849 107.00000  -0.372  0.7107
## age              -0.05603    0.02816 168.81000  -1.989  0.0483
## INCOMEcst        -0.92004    0.22076 168.81000  -4.168 4.91e-05
## SEXMALE           0.27722    0.38463 168.81000   0.721  0.4721
## RACEASIAN PACIFIC -1.00943    2.12082 168.81000  -0.476  0.6347
## RACEWHITE         -0.07521    0.59324 168.81000  -0.127  0.8993
## neurotic          0.07731    0.01813 168.81000   4.264 3.33e-05
## edu:timehigh     -0.09470    0.07769 107.00000  -1.219  0.2256
## timehigh:age      0.03258    0.02767 107.00000   1.178  0.2415
## timehigh:INCOMEcst 0.47597    0.21688 107.00000   2.195  0.0304
## timehigh:SEXMALE  -0.16522    0.37787 107.00000  -0.437  0.6628
## timehigh:RACEASIAN PACIFIC 1.02318    2.08355 107.00000   0.491  0.6244
## timehigh:RACEWHITE 0.02674    0.58281 107.00000   0.046  0.9635
## timehigh:neurotic -0.05672    0.01781 107.00000  -3.184  0.0019
##
## (Intercept)      **
## edu
## timehigh
## age              *
## INCOMEcst        ***
## SEXMALE
## RACEASIAN PACIFIC
## RACEWHITE
## neurotic         ***
## edu:timehigh
## timehigh:age
## timehigh:INCOMEcst *
## timehigh:SEXMALE
## timehigh:RACEASIAN PACIFIC
```

```

## timehigh:RACEWHITE
## timehigh:neurotic          **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

##
## Correlation matrix not shown by default, as p = 16 > 12.
## Use print(x, correlation=TRUE) or
##   vcov(x)      if you need it
car::Anova(m5)

## Analysis of Deviance Table (Type II Wald chisquare tests)
##
## Response: SES
##           Chisq Df Pr(>Chisq)
## edu           3.1861 1  0.0742681 .
## time        129.2254 1 < 2.2e-16 ***
## age           2.6240 1  0.1052600
## INCOMEcst     12.5814 1  0.0003896 ***
## SEX           0.3374 1  0.5613161
## RACE          0.0767 2  0.9623781
## neurotic      9.6086 1  0.0019367 **
## edu:time       1.4857 1  0.2228802
## time:age       1.3870 1  0.2389095
## time:INCOMEcst 4.8165 1  0.0281889 *
## time:SEX       0.1912 1  0.6619306
## time:RACE      0.2448 2  0.8848149
## time:neurotic  10.1379 1  0.0014525 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

ls5 <- lsmeans(m5, "time", by = c("neurotic"), at=list(neurotic = c(10,50)))
plot(ls5, type ~ SES, horiz=F, ylab = "SES", xlab = "time", comparisons = TRUE, alpha = 0.05)

```

