# Group analysis

## Load packages

```
pacman::p_load(readr, lme4, emmeans, yarrr, ggplot2, dplyr)
```

## Load data

```
amp = read_csv("amp.csv")
```

```
## Rows: 320 Columns: 7
```

```
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr (4): Time, Channel, Deviant, Group
## dbl (3): ID, Amplitude, DeviantLevel
```

```
##
## i Use ‘spec()‘ to retrieve the full column specification for this data.
## i Specify the column types or set ‘show_col_types = FALSE‘ to quiet this message.
```

```
amp_all = read_csv("amp_all.csv")
```

```
## Rows: 576 Columns: 7
```

```
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr (3): Channel, Deviant, Group
## dbl (4): ID, DeviantLevel, Amplitude.T1, Amplitude.T2
```

```
##
## i Use ‘spec()‘ to retrieve the full column specification for this data.
## i Specify the column types or set ‘show_col_types = FALSE‘ to quiet this message.
```

```
lat = read_csv("lat.csv")
```

```
## Rows: 320 Columns: 7
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr (4): Time, Channel, Deviant, Group
## dbl (3): ID, Latency_peak, DeviantLevel
```

```
##
## i Use ‘spec()‘ to retrieve the full column specification for this data.
## i Specify the column types or set ‘show_col_types = FALSE‘ to quiet this message.
```

```r
lat_all = read_csv("lat_all.csv")
```

```
## Rows: 576 Columns: 7
```

```
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr (3): Channel, Deviant, Group
## dbl (4): ID, DeviantLevel, Latency_peak.T1, Latency_peak.T2
```

```
##
## i Use ‘spec()‘ to retrieve the full column specification for this data.
## i Specify the column types or set ‘show_col_types = FALSE‘ to quiet this message.
```

```r
All_behav = read_csv("All_behav.csv")
```

```
## Rows: 752 Columns: 6
```

```
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr (3): Round, Deviant, Group
## dbl (3): ID, DeviantLevel, AvCor
```

```
##
## i Use ‘spec()‘ to retrieve the full column specification for this data.
## i Specify the column types or set ‘show_col_types = FALSE‘ to quiet this message.
```

```r
amp$ID=as.factor(amp$ID)
amp$Deviant=as.factor(amp$Deviant)
amp$DeviantLevel=as.factor(amp$DeviantLevel)
amp$Group=as.factor(amp$Group)

amp_all$ID=as.factor(amp_all$ID)
amp_all$Deviant=as.factor(amp_all$Deviant)
amp_all$DeviantLevel=as.factor(amp_all$DeviantLevel)
amp_all$Group=as.factor(amp_all$Group)

lat$ID=as.factor(lat$ID)
lat$Deviant=as.factor(lat$Deviant)
lat$DeviantLevel=as.factor(lat$DeviantLevel)
lat$Group=as.factor(lat$Group)

lat_all$ID=as.factor(lat_all$ID)
```

```
lat_all$Deviant=as.factor(lat_all$Deviant)
lat_all$DeviantLevel=as.factor(lat_all$DeviantLevel)
lat_all$Group=as.factor(lat_all$Group)

All_behav$ID=as.factor(All_behav$ID)
All_behav$Deviant=as.factor(All_behav$Deviant)
All_behav$DeviantLevel=as.factor(All_behav$DeviantLevel)
All_behav$Group=as.factor(All_behav$Group)
```

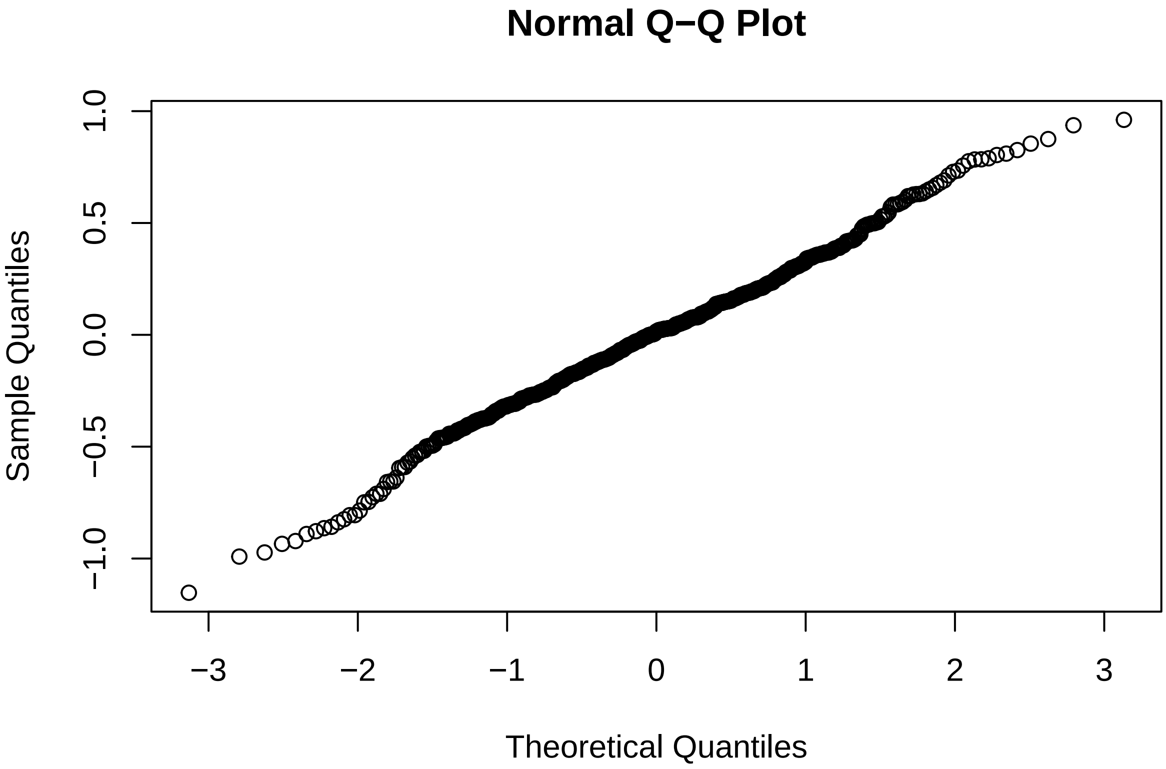
## Hierarchical mixed effects modeling - MMN Amplitude (T2)

```
M0=lmer(Amplitude.T2~1+(1|ID), data=amp_all, REML = FALSE, control = lmerControl(optimizer = "nloptwrap

M1=lmer(Amplitude.T2~Deviant+(1|ID), data=amp_all, REML = FALSE, control = lmerControl(optimizer = "nlop

M2=lmer(Amplitude.T2~Deviant+DeviantLevel+(1|ID), data=amp_all, REML = FALSE, control = lmerControl(opti

M3=lmer(Amplitude.T2~Deviant+DeviantLevel+Group+(1|ID), data=amp_all, REML = FALSE, control = lmerContro

M4=lmer(Amplitude.T2~Deviant*DeviantLevel+Group+(1|ID), data=amp_all, REML = FALSE, control = lmerContro

M5=lmer(Amplitude.T2~Deviant*DeviantLevel+Deviant*Group+(1|ID), data=amp_all, REML = FALSE, control = lm

M6=lmer(Amplitude.T2~Deviant*DeviantLevel+Deviant*Group+DeviantLevel*Group+(1|ID), data=amp_all, REML =

M7=lmer(Amplitude.T2~Deviant*Group*DeviantLevel+(1|ID), data=amp_all, REML = FALSE, control = lmerContro

#comparing models
anova(M0,M1,M2,M3,M4,M5,M6,M7)
```

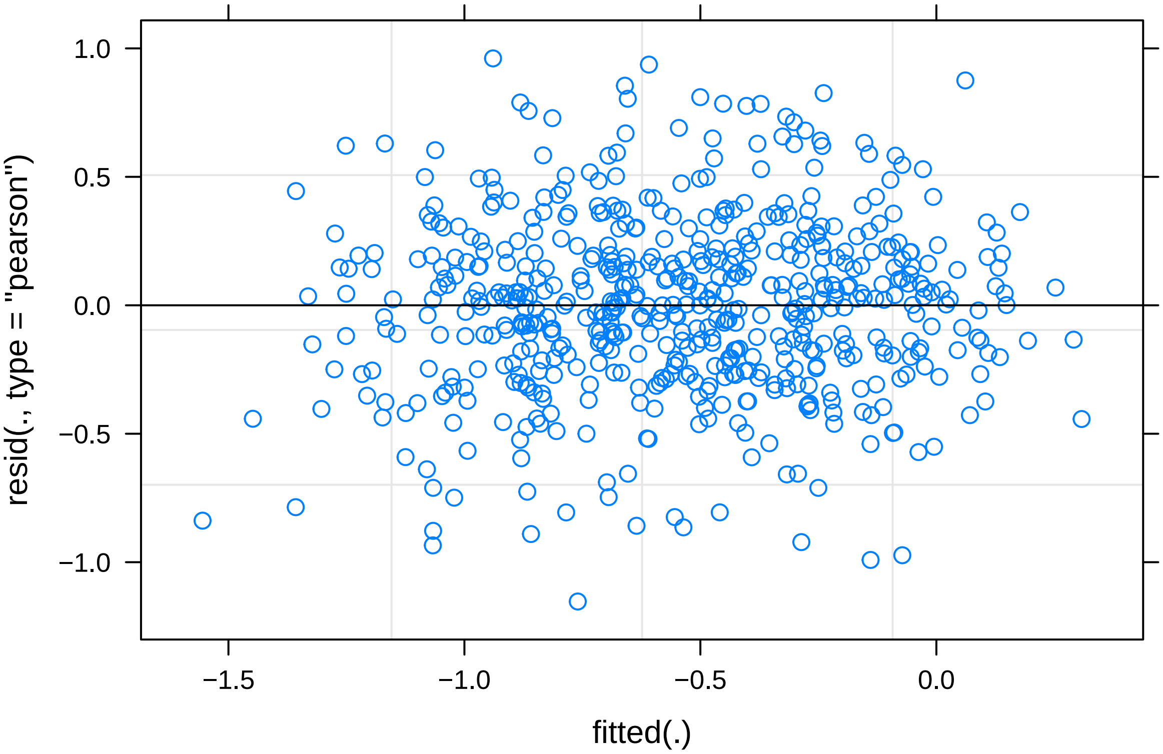
```
## Data: amp_all
## Models:
## M0: Amplitude.T2 ~ 1 + (1 | ID)
## M1: Amplitude.T2 ~ Deviant + (1 | ID)
## M2: Amplitude.T2 ~ Deviant + DeviantLevel + (1 | ID)
## M3: Amplitude.T2 ~ Deviant + DeviantLevel + Group + (1 | ID)
## M4: Amplitude.T2 ~ Deviant * DeviantLevel + Group + (1 | ID)
## M5: Amplitude.T2 ~ Deviant * DeviantLevel + Deviant * Group + (1 | ID)
## M6: Amplitude.T2 ~ Deviant * DeviantLevel + Deviant * Group + DeviantLevel * Group + (1 | ID)
## M7: Amplitude.T2 ~ Deviant * Group * DeviantLevel + (1 | ID)
##    npar    AIC    BIC  logLik deviance   Chisq Df Pr(>Chisq)
## M0    3 630.01 643.08 -312.00   624.01
## M1    6 595.29 621.43 -291.64   583.29 40.7199  3  7.498e-09 ***
## M2    9 588.03 627.23 -285.01   570.03 13.2616  3   0.004104 **
## M3   11 580.13 628.05 -279.07   558.13 11.8963  2   0.002611 **
## M4   20 560.60 647.72 -260.30   520.60 37.5337  9  2.113e-05 ***
## M5   26 564.79 678.05 -256.40   512.79  7.8036  6   0.252851
## M6   32 566.77 706.17 -251.39   502.77 10.0219  6   0.123732
## M7   50 584.80 802.61 -242.40   484.80 17.9704 18   0.457605
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

### Best model

```
qqnorm(resid(M4))
```



```
plot(M4)
```



### Post-hoc analysis

```
emm_g <- emmeans(M4, pairwise ~ Group, adjust = "bonferroni")
emm_g[[2]]
```

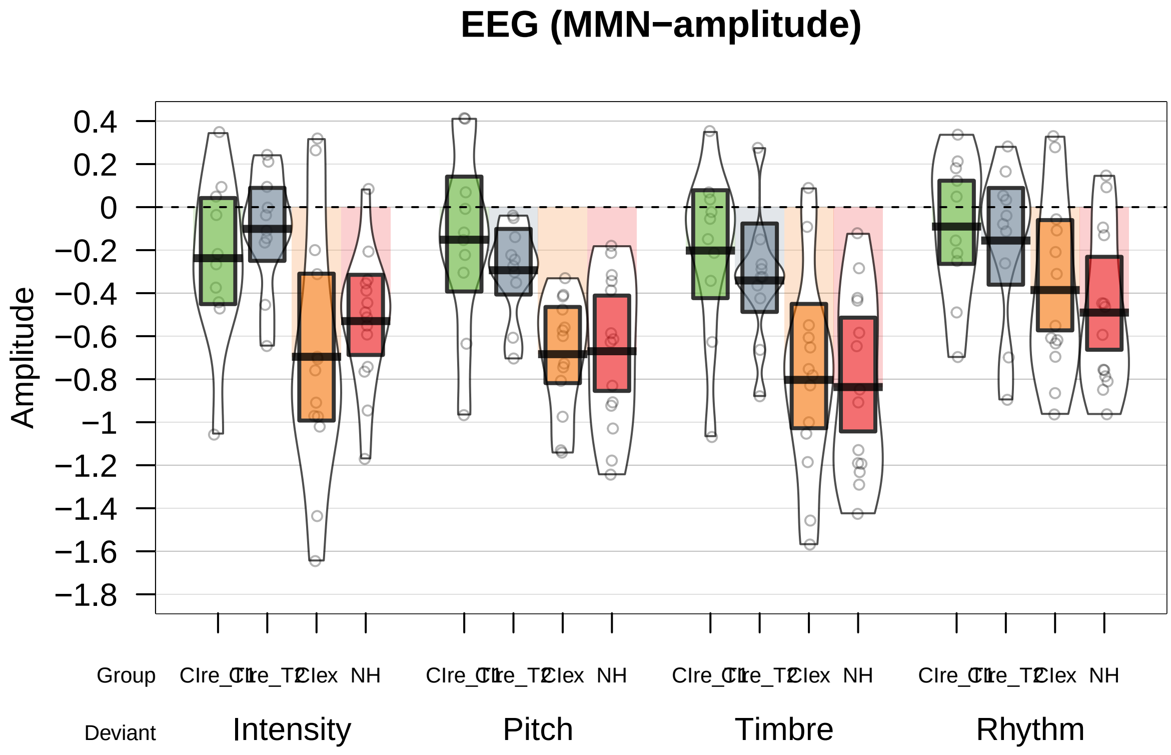
```
##  contrast       estimate    SE   df t.ratio p.value
##  CI_ex - CI_re    -0.413 0.132 39.3  -3.126  0.0100
##  CI_ex - NH_old    0.016 0.117 39.3   0.137  1.0000
##  CI_re - NH_old    0.429 0.130 39.3   3.296  0.0063
##
## Results are averaged over the levels of: Deviant, DeviantLevel
## Degrees-of-freedom method: kenward-roger
## P value adjustment: bonferroni method for 3 tests
```

### Plot

```
ID_plot_data = read_csv("ID_plot_data_amp.csv")
```

```
## Rows: 188 Columns: 5
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr (3): Group, Time, Deviant
## dbl (2): ID, Amp

##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
pirat = ID_plot_data
pirat$Group[pirat$Time =="CIre_T1"]=gsub("CI_re", "CIre_T1", pirat$Group[pirat$Time =="CIre_T1"])
pirat$Group[pirat$Time =="CIre_T2"]=gsub("CI_re", "CIre_T2", pirat$Group[pirat$Time =="CIre_T2"])
pirat$Group=ordered(pirat$Group, levels=c("CIre_T1", "CIre_T2", "CIex", "NH"))
pirat$Deviant=ordered(pirat$Deviant, levels=c("Intensity", "Pitch", "Timbre", "Rhythm"))

pirateplot(formula = Amp ~ Group + Deviant, data = pirat, main = "EEG (MMN-amplitude)", xlab = "group",
  abline(a=0, b=0, lwd=1, lty="dashed")
```



```
## integer(0)
```

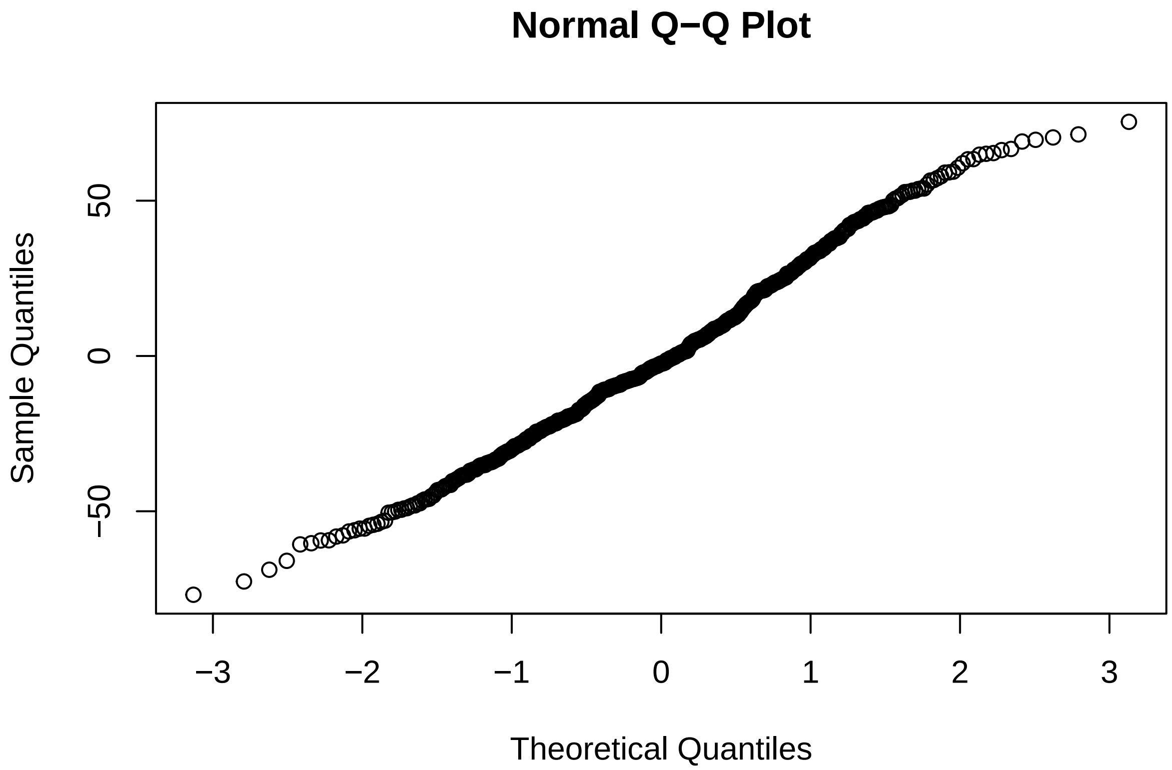
## Hierarchical mixed effects modeling - Latency (T2)

```
M0=lmer(Latency_peak.T2~1+(1|ID), data=lat_all, REML = FALSE, control = lmerControl(optimizer = "nloptw

M1=lmer(Latency_peak.T2~Deviant+(1|ID), data=lat_all, REML = FALSE, control = lmerControl(optimizer = "n

M2=lmer(Latency_peak.T2~Deviant+DeviantLevel+(1|ID), data=lat_all, REML = FALSE, control = lmerControl(

M3=lmer(Latency_peak.T2~Deviant+DeviantLevel+Group+(1|ID), data=lat_all, REML = FALSE, control = lmerCon

M4=lmer(Latency_peak.T2~Deviant*DeviantLevel+Group+(1|ID), data=lat_all, REML = FALSE, control = lmerCon

M5=lmer(Latency_peak.T2~Deviant*DeviantLevel+Deviant*Group+(1|ID), data=lat_all, REML = FALSE, control =

M6=lmer(Latency_peak.T2~Deviant*DeviantLevel+Deviant*Group+DeviantLevel*Group+(1|ID), data=lat_all, REML

M7=lmer(Latency_peak.T2~Deviant*DeviantLevel*Group+(1|ID), data=lat_all, REML = FALSE, control = lmerCon

#comparing models
anova(M0,M1,M2,M3,M4,M5,M6, M7)
```

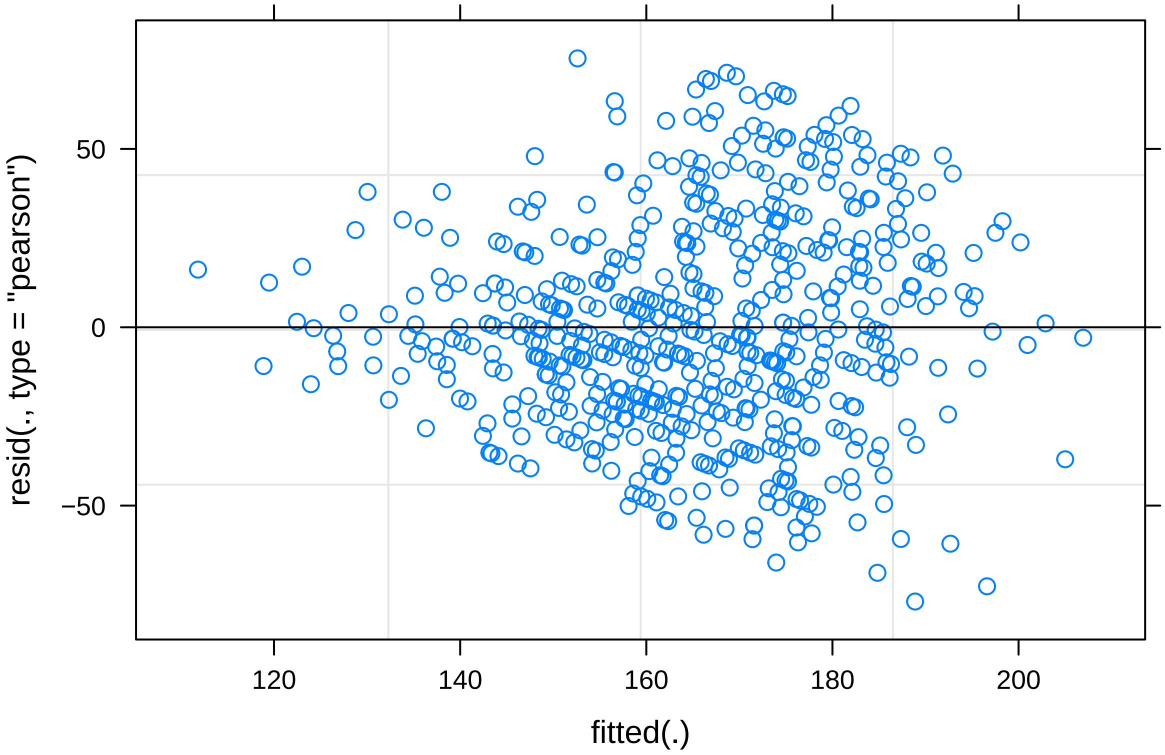
```
## Data: lat_all
## Models:
## M0: Latency_peak.T2 ~ 1 + (1 | ID)
## M1: Latency_peak.T2 ~ Deviant + (1 | ID)
## M2: Latency_peak.T2 ~ Deviant + DeviantLevel + (1 | ID)
## M3: Latency_peak.T2 ~ Deviant + DeviantLevel + Group + (1 | ID)
## M4: Latency_peak.T2 ~ Deviant * DeviantLevel + Group + (1 | ID)
## M5: Latency_peak.T2 ~ Deviant * DeviantLevel + Deviant * Group + (1 | ID)
## M6: Latency_peak.T2 ~ Deviant * DeviantLevel + Deviant * Group + DeviantLevel * Group + (1 | ID)
## M7: Latency_peak.T2 ~ Deviant * DeviantLevel * Group + (1 | ID)
##    npar    AIC    BIC  logLik deviance   Chisq Df Pr(>Chisq)
## M0    3 5647.3 5660.4 -2820.7   5641.3
## M1    6 5645.7 5671.8 -2816.9   5633.7  7.5894  3  0.0553056 .
## M2    9 5648.2 5687.3 -2815.1   5630.2  3.5513  3  0.3141733
## M3   11 5632.1 5680.0 -2805.1   5610.1 20.0574  2  4.411e-05 ***
## M4   20 5628.1 5715.2 -2794.1   5588.1 21.9737  9  0.0089626 **
## M5   26 5616.1 5729.3 -2782.1   5564.1 23.9943  6  0.0005235 ***
## M6   32 5624.6 5763.8 -2780.3   5560.6  3.5498  6  0.7373360
## M7   50 5646.3 5863.8 -2773.1   5546.3 14.3246 18  0.7076967
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

## Best model

```
qqnorm(resid(M5))
```


Normal Q−Q Plot
Sample Quantiles
−50
0
50
Theoretical Quantiles
−3
−2
−1
0
1
2
3

```
plot(M5)
```



### Post-hoc analysis

```
emm_g <- emmeans(M5, pairwise ~ Group)
```

```
## NOTE: Results may be misleading due to involvement in interactions
```

```
emm_gc <- emm_g[[2]]

emm_d <- emmeans(M5, pairwise ~ Deviant)
```

```
## NOTE: Results may be misleading due to involvement in interactions
```

```
emm_dc <- emm_d[[2]]

#Group by deviant interaction

emm_g.d <- emmeans(M5, pairwise ~ Group | Deviant)
IC_g.d <- contrast(emm_g.d[[1]], method = "pairwise")

#Tukey
IC_g.d
```

```
## Deviant = Intensity:
##  contrast        estimate   SE  df t.ratio p.value
##  CI_ex - CI_re     -18.56 7.91 173  -2.346  0.0523
##  CI_ex - NH_old     -5.23 7.03 173  -0.744  0.7375
##  CI_re - NH_old     13.33 7.80 173   1.710  0.2043
##
## Deviant = Pitch:
##  contrast        estimate   SE  df t.ratio p.value
##  CI_ex - CI_re      -3.38 7.91 173  -0.428  0.9041
##  CI_ex - NH_old     21.04 7.03 173   2.994  0.0088
##  CI_re - NH_old     24.43 7.80 173   3.133  0.0057
##
## Deviant = Rhythm:
##  contrast        estimate   SE  df t.ratio p.value
##  CI_ex - CI_re     -17.43 7.96 176  -2.190  0.0758
##  CI_ex - NH_old     26.56 7.11 179   3.738  0.0007
##  CI_re - NH_old     44.00 7.82 174   5.628  <.0001
##
## Deviant = Timbre:
##  contrast        estimate   SE  df t.ratio p.value
##  CI_ex - CI_re     -19.78 7.91 173  -2.499  0.0355
##  CI_ex - NH_old      3.64 7.03 173   0.518  0.8625
##  CI_re - NH_old     23.42 7.80 173   3.004  0.0086
##
## Results are averaged over the levels of: DeviantLevel
## Degrees-of-freedom method: kenward-roger
## P value adjustment: tukey method for comparing a family of 3 estimates
```

```
#Bonferroni
rbind(IC_g.d, adjust = "bonferroni")
```

```
##  Deviant   contrast        estimate   SE  df t.ratio p.value
##  Intensity CI_ex - CI_re     -18.56 7.91 173  -2.346  0.2413
##  Intensity CI_ex - NH_old     -5.23 7.03 173  -0.744  1.0000
##  Intensity CI_re - NH_old     13.33 7.80 173   1.710  1.0000
##  Pitch     CI_ex - CI_re      -3.38 7.91 173  -0.428  1.0000
##  Pitch     CI_ex - NH_old     21.04 7.03 173   2.994  0.0379
##  Pitch     CI_re - NH_old     24.43 7.80 173   3.133  0.0244
##  Rhythm    CI_ex - CI_re     -17.43 7.96 176  -2.190  0.3585
##  Rhythm    CI_ex - NH_old     26.56 7.11 179   3.738  0.0030
##  Rhythm    CI_re - NH_old     44.00 7.82 174   5.628  <.0001
##  Timbre    CI_ex - CI_re     -19.78 7.91 173  -2.499  0.1605
##  Timbre    CI_ex - NH_old      3.64 7.03 173   0.518  1.0000
##  Timbre    CI_re - NH_old     23.42 7.80 173   3.004  0.0367
##
## Results are averaged over some or all of the levels of: DeviantLevel
## Degrees-of-freedom method: kenward-roger
## P value adjustment: bonferroni method for 12 tests
```

## Plot

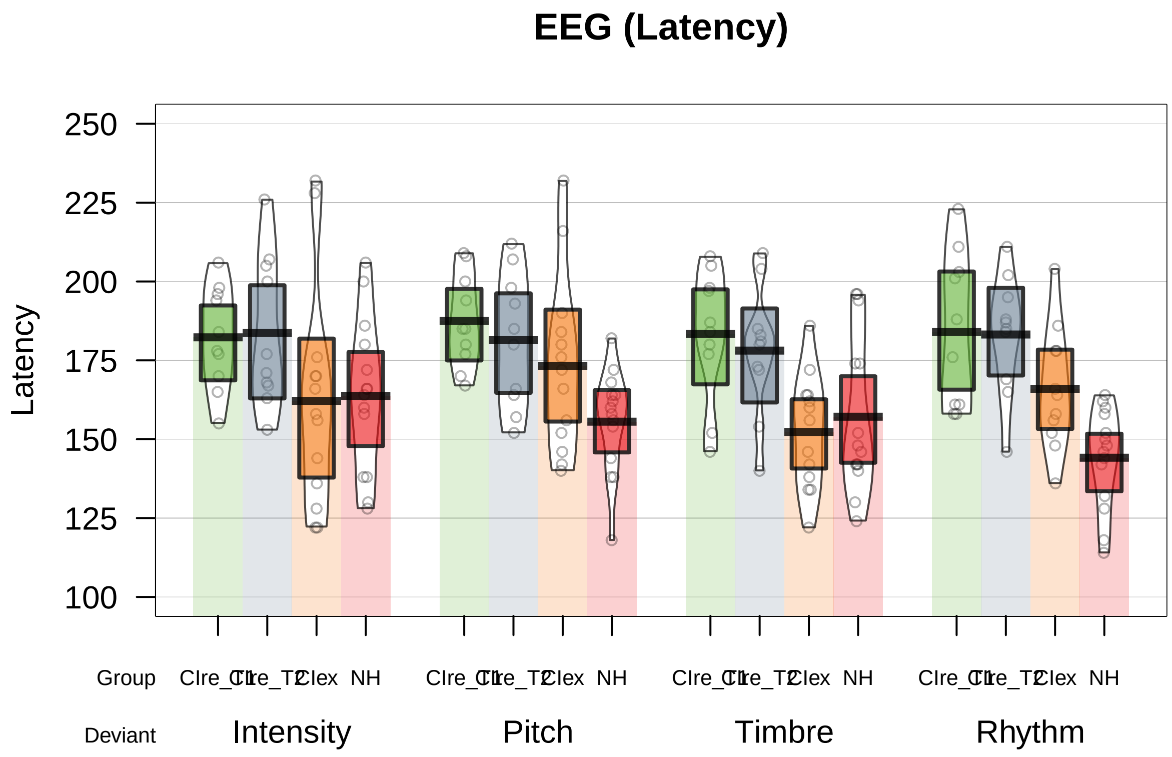
```
ID_plot_data = read_csv("ID_plot_data_lat.csv")
```

```
## Rows: 188 Columns: 5
```

```
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr (3): Group, Time, Deviant
## dbl (2): ID, Lat
```

```
##
## i Use ‘spec()‘ to retrieve the full column specification for this data.
## i Specify the column types or set ‘show_col_types = FALSE‘ to quiet this message.
```

```
pirat = ID_plot_data
pirat$Group[pirat$Time =="CIre_T1"]=gsub("CI_re", "CIre_T1", pirat$Group[pirat$Time =="CIre_T1"])
pirat$Group[pirat$Time =="CIre_T2"]=gsub("CI_re", "CIre_T2", pirat$Group[pirat$Time =="CIre_T2"])
pirat$Group=ordered(pirat$Group, levels=c("CIre_T1", "CIre_T2", "CIex", "NH"))
pirat$Deviant=ordered(pirat$Deviant, levels=c("Intensity", "Pitch", "Timbre", "Rhythm"))

pirateplot(formula = Lat ~ Group + Deviant, data = pirat, main = "EEG (Latency)", xlab = "group",ylab="
```



## Hierarchical mixed effects modeling - Behavioral (T2)

```
M0=glmer(cbind(AvCor*6,6)~1+(1|ID), data=All_behav[All_behav$Group!="CIre_T1",], family="binomial", con

M1=glmer(cbind(AvCor*6,6)~Deviant+(1|ID), data=All_behav[All_behav$Group!="CIre_T1",], family="binomial

M2=glmer(cbind(AvCor*6,6)~Deviant+DeviantLevel+(1|ID), data=All_behav[All_behav$Group!="CIre_T1",], fam

M3=glmer(cbind(AvCor*6,6)~Deviant+DeviantLevel+Group+(1|ID), data=All_behav[All_behav$Group!="CIre_T1",

M4=glmer(cbind(AvCor*6,6)~Deviant*DeviantLevel+Group+(1|ID), data=All_behav[All_behav$Group!="CIre_T1",

M5=glmer(cbind(AvCor*6,6)~Deviant*DeviantLevel+Deviant*Group+(1|ID), data=All_behav[All_behav$Group!="C

M6=glmer(cbind(AvCor*6,6)~Deviant*DeviantLevel+Deviant*Group+DeviantLevel*Group+(1|ID), data=All_behav[

M7=glmer(cbind(AvCor*6,6)~Deviant*DeviantLevel*Group+(1|ID), data=All_behav[All_behav$Group!="CIre_T1",



#Comparing models
anova(M0, M1, M2, M3, M4, M5, M6, M7)
```

```
## Data: All_behav[All_behav$Group != "CIre_T1", ]
## Models:
## M0: cbind(AvCor * 6, 6) ~ 1 + (1 | ID)
## M1: cbind(AvCor * 6, 6) ~ Deviant + (1 | ID)
## M2: cbind(AvCor * 6, 6) ~ Deviant + DeviantLevel + (1 | ID)
## M3: cbind(AvCor * 6, 6) ~ Deviant + DeviantLevel + Group + (1 | ID)
## M4: cbind(AvCor * 6, 6) ~ Deviant * DeviantLevel + Group + (1 | ID)
## M5: cbind(AvCor * 6, 6) ~ Deviant * DeviantLevel + Deviant * Group + (1 | ID)
## M6: cbind(AvCor * 6, 6) ~ Deviant * DeviantLevel + Deviant * Group + DeviantLevel * Group + (1 | ID)
## M7: cbind(AvCor * 6, 6) ~ Deviant * DeviantLevel * Group + (1 | ID)
##    npar    AIC    BIC  logLik deviance    Chisq Df Pr(>Chisq)
## M0    2 3285.4 3294.2 -1640.7   3281.4
## M1    5 3148.9 3170.9 -1569.4   3138.9 142.4992  3  < 2.2e-16 ***
## M2    8 3023.4 3058.6 -1503.7   3007.4 131.5106  3  < 2.2e-16 ***
## M3   10 3013.1 3057.2 -1496.5   2993.1  14.2960  2  0.0007865 ***
## M4   19 3000.5 3084.3 -1481.2   2962.5  30.5745  9  0.0003501 ***
## M5   25 2989.8 3100.0 -1469.9   2939.8  22.7074  6  0.0009006 ***
## M6   31 2999.6 3136.4 -1468.8   2937.6   2.1517  6  0.9052355
## M7   49 3028.3 3244.4 -1465.2   2930.3   7.3054 18  0.9872881
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

### Post-hoc analysis

```
emm_g <- emmeans(M5, pairwise ~ Group)
```

```
## NOTE: Results may be misleading due to involvement in interactions
```

```r
emm_gc <- emm_g[[2]]

emm_d <- emmeans(M5, pairwise ~ Deviant)
```

```
## NOTE: Results may be misleading due to involvement in interactions
```

```r
emm_dc <- emm_d[[2]]

#Group by deviant interaction

emm_g.d <- emmeans(M5, pairwise ~ Group | Deviant)
IC_g.d <- contrast(emm_g.d[[1]], method = "pairwise")

#Tukey
IC_g.d
```

```
## Deviant = Intensity:
##  contrast       estimate     SE  df z.ratio p.value
##  CIex - CIre_T2  0.35741 0.1034 Inf   3.457  0.0016
##  CIex - NH      -0.20245 0.0909 Inf  -2.227  0.0668
##  CIre_T2 - NH   -0.55986 0.1045 Inf  -5.355  <.0001
##
## Deviant = Pitch:
##  contrast       estimate     SE  df z.ratio p.value
##  CIex - CIre_T2 -0.01612 0.1028 Inf  -0.157  0.9865
##  CIex - NH      -0.30744 0.0904 Inf  -3.399  0.0020
##  CIre_T2 - NH   -0.29131 0.1041 Inf  -2.798  0.0142
##
## Deviant = Rhythm:
##  contrast       estimate     SE  df z.ratio p.value
##  CIex - CIre_T2  0.05128 0.1025 Inf   0.500  0.8712
##  CIex - NH       0.00322 0.0904 Inf   0.036  0.9993
##  CIre_T2 - NH   -0.04806 0.1038 Inf  -0.463  0.8886
##
## Deviant = Timbre:
##  contrast       estimate     SE  df z.ratio p.value
##  CIex - CIre_T2  0.11795 0.1026 Inf   1.150  0.4835
##  CIex - NH      -0.15342 0.0903 Inf  -1.699  0.2056
##  CIre_T2 - NH   -0.27137 0.1039 Inf  -2.611  0.0245
##
## Results are averaged over the levels of: DeviantLevel
## Results are given on the log odds ratio (not the response) scale.
## P value adjustment: tukey method for comparing a family of 3 estimates
```

```r
#Bonferroni
rbind(IC_g.d, adjust = "bonferroni")
```

```
##  Deviant   contrast       estimate     SE  df z.ratio p.value
##  Intensity CIex - CIre_T2  0.35741 0.1034 Inf   3.457  0.0066
##  Intensity CIex - NH      -0.20245 0.0909 Inf  -2.227  0.3117
##  Intensity CIre_T2 - NH   -0.55986 0.1045 Inf  -5.355  <.0001
##  Pitch     CIex - CIre_T2 -0.01612 0.1028 Inf  -0.157  1.0000
##  Pitch     CIex - NH      -0.30744 0.0904 Inf  -3.399  0.0081
##  Pitch     CIre_T2 - NH   -0.29131 0.1041 Inf  -2.798  0.0616
##  Rhythm    CIex - CIre_T2  0.05128 0.1025 Inf   0.500  1.0000
##  Rhythm    CIex - NH       0.00322 0.0904 Inf   0.036  1.0000
##  Rhythm    CIre_T2 - NH   -0.04806 0.1038 Inf  -0.463  1.0000
##  Timbre    CIex - CIre_T2  0.11795 0.1026 Inf   1.150  1.0000
##  Timbre    CIex - NH      -0.15342 0.0903 Inf  -1.699  1.0000
##  Timbre    CIre_T2 - NH   -0.27137 0.1039 Inf  -2.611  0.1083
##
## Results are averaged over some or all of the levels of: DeviantLevel
## Results are given on the log odds ratio (not the response) scale.
## P value adjustment: bonferroni method for 12 tests
```

### Plots behavioral

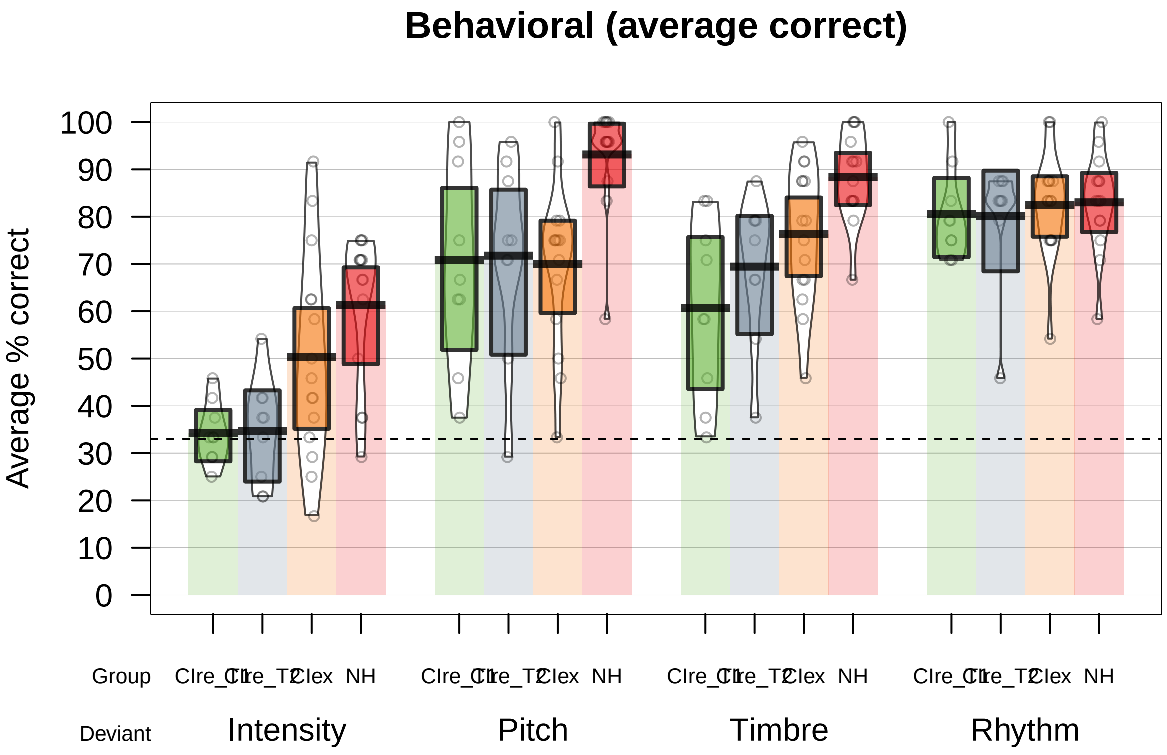
```
ID_plot_data = read_csv("ID_plot_data_behav.csv")
```

```
## Rows: 188 Columns: 5
```

```
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr (3): Group, Round, Deviant
## dbl (2): ID, AvCor
```

```
##
## i Use ‘spec()‘ to retrieve the full column specification for this data.
## i Specify the column types or set ‘show_col_types = FALSE‘ to quiet this message.
```

```
ID_plot_data$Group=ordered(ID_plot_data$Group, levels=c("CIre_T1", "CIre_T2", "CIex", "NH"))
ID_plot_data$Deviant=ordered(ID_plot_data$Deviant, levels=c("Intensity", "Pitch", "Timbre", "Rhythm"))

## Creating pirateplot
pirateplot(formula = AvCor ~ Group + Deviant, data = ID_plot_data, main = "Behavioral (average correct)
  abline(a=33,33, b=0, lwd=1, lty="dashed")
```



Behavioral (average correct)
Average % correct
100
90
80
70
60
50
40
30
20
10
0
Group
CIre_T1
CIre_T2
CIex
NH
Deviant
Intensity
Pitch
Timbre
Rhythm

```
## integer(0)
```