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# analysis of psychoacoustic measures (discrimination of pitch and
duration)

setwd('/home/allgoodguys/Documents/Studying/Lund_PhD/epistles/
005_with-Lima/analysis')
library(lme4)
require(brms)

df = read.csv ('data/data_preprocessed.csv')[,-1]
df$memTask_max = ifelse(df$condition=='Load 1', 6, 8)
df$memTask_prop = df$memTask/df$memTask_max

out = df[1,]
for (i in 1:length(unique(df$subject))){
  out = rbind (out, df[df$subject == unique(df$subject)[i],] [1,]) #
save just one line per participant
}
out =
out[-1,c('subject','condition','memTask','memTask_max','memTask_prop
','yearsMusic','ageMusic','highLowDiscrim','durDiscrim')]
# cor(out[,5:9], use='pairwise.complete.obs')

hist(log(out$highLowDiscrim)) # hist(out$highLowDiscrim)
plot(density(log(out$highLowDiscrim), na.rm=T)) # normal-ish, with a
hint of bimodality

hist(out$durDiscrim)
plot(density(out$durDiscrim, na.rm=T)) # now that's a weird
distribution... Definitely bimodal

plot(log(out$highLowDiscrim), out$durDiscrim)
cor(log(out$highLowDiscrim), out$durDiscrim,
use='pairwise.complete.obs')

## musical education
table(df$yearsMusic)
table(is.na(out$ageMusic)) # NB: only for those with >0 musical
education, hence the many NA's

plot(density(log(out$highLowDiscrim[out$yearsMusic>0]), na.rm=T))

mod_highLow = lm(log(highLowDiscrim) ~ yearsMusic+ageMusic,
data=out)
summary(mod_highLow)
drop1(mod_highLow, test='F')

summary(lm(log(highLowDiscrim) ~ yearsMusic, data=out))
summary(lm(log(highLowDiscrim) ~ ageMusic, data=out))
summary(lm(log(highLowDiscrim) ~ condition, data=out))

plot(density(log(out$durDiscrim[out$yearsMusic>0]), na.rm=T))

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mod_dur = lm(durDiscrim ~ yearsMusic+ageMusic, data=out)
plot(mod_dur)
summary(mod_dur)
drop1(mod_dur, test='F')

summary(lm(durDiscrim ~ yearsMusic, data=out))
summary(lm(durDiscrim ~ ageMusic, data=out))
summary(lm(log(durDiscrim) ~ condition, data=out))

## Do psychoacoustic measures predict hit rates?
df_target = df[df$type=='target',] # targets only

# highLowDiscrim
highLow = df_target[!is.na(df_target$highLowDiscrim), ]
mod0 = glmer(hit ~ highLowDiscrim * condition + (1|subject)+(1|
item), family='binomial', data=highLow, nAGQ=0)
summary(mod0)
drop1(mod0, test='Chisq') # no interaction

mod1 = glmer(hit ~ highLowDiscrim + (1|subject)+(1|item),
family='binomial', data=highLow, nAGQ=0)
summary(mod1)
drop1(mod1, test='Chisq') # no effect

# durDiscrim
dur = df_target[!is.na(df_target$durDiscrim), ]
mod0 = glmer(hit ~ durDiscrim * condition + (1|subject)+(1|item),
family='binomial', data=dur, nAGQ=0)
summary(mod0)
drop1(mod0, test='Chisq') # no

mod1 = glmer(hit ~ durDiscrim + (1|subject)+(1|item),
family='binomial', data=dur, nAGQ=0)
summary(mod1)
drop1(mod1, test='Chisq') # no interaction

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