# acoustic_analysis

```
# location_condition is an attribute of the trials with
# levels Agent, patient, verb, and control.  locaiton is an
# attribute of the word with levels Agent, patient, verb
# condition is an attribute of the trial with levels contrast
# and control.

cur_exp = "exp8"
features = c("duration", "meanIntensity", "meanpit")
# info = c('participant','verb','condition', 'word',
# 'word_num')
info = c("participant", "item_id", "location_condition", "word",
    "word_num", "present_num")
bRemove_outliers = 1
# I have experimented with removing outliers, it doesn't have
# much effect on duration, some people with extreme pitch or
# intensity get removed.

tAll_trials = read.csv(file.path("..", cur_exp, "tAll_trials.csv"))


df0 = read.csv(paste0("measure_", cur_exp, ".csv"), header = T)
df0$location_condition = NA
df0$item_id = NA

for (iR in 1:nrow(df0)) {
    df0$location_condition[iR] = as.character(tAll_trials[tAll_trials$trial_id ==
        df0$trialId[iR], "location_condition"])
    df0$item_id[iR] = as.character(tAll_trials[tAll_trials$trial_id ==
        df0$trialId[iR], "filler_or_item_id"])
    df0$present_num[iR] = as.numeric(rownames(tAll_trials[tAll_trials$trial_id ==
        df0$trialId[iR], ]))
}


df1 = df0[startsWith(df0$item_id, "item"), ]

# df0 =
# read.csv('measure_nonrhyming_84total_60No_24Yes_20181210.csv',
# header = T) df0 =
# transform(df0,trialId=as.numeric(trialId))
# sort(df0$trialId, decreasing = FALSE) colnamesC(df1)

df2 = df1[df1$word != "sp", ]  # there can be sp everywhere not just begginning or end
# code for word_num
df2 <- df2 %>% dplyr::group_by(participant, trialId) %>% # dplyr::group_by(participant, question, trial
dplyr::mutate(word_num = 1:dplyr::n()) %>% dplyr::select(c(info,
    features))
```

```
## Adding missing grouping variables: `trialId`
```

```
c(df_Verb, df_Agent, df_Patient) %<-% process_data_with_yes(df2)
```

```
## [1] 0
```

```
# c(df_Verb, df_Agent, df_Patient) %<-%
# process_data_without_yes(df2)


df_Agent$condition = mapvalues(df_Agent$location_condition, c("Agent"),
    c("contrast"))
df_Verb$condition = mapvalues(df_Verb$location_condition, c("Verb"),
    c("contrast"))
```

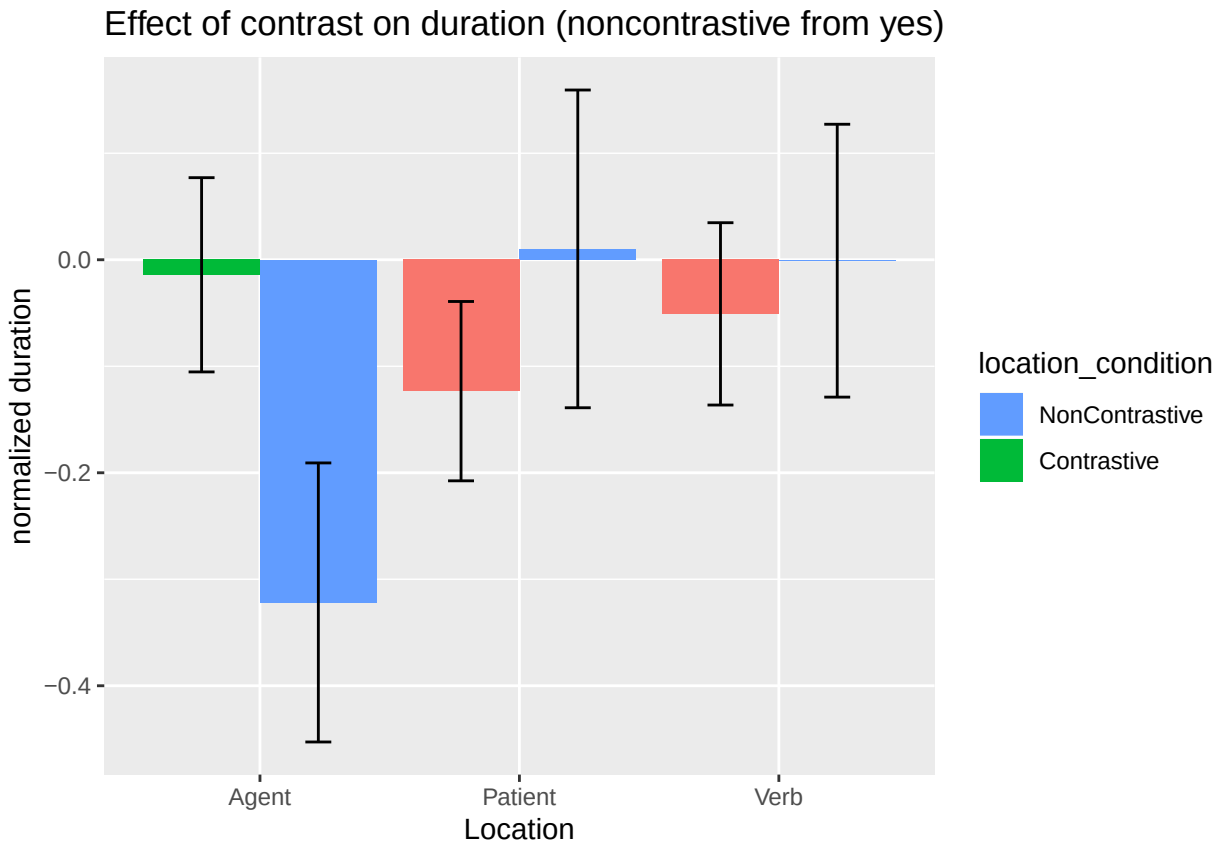
```
## The following `from` values were not present in `x`: Verb
```

```
df_Patient$condition = mapvalues(df_Patient$location_condition,
    c("Patient"), c("contrast"))
```

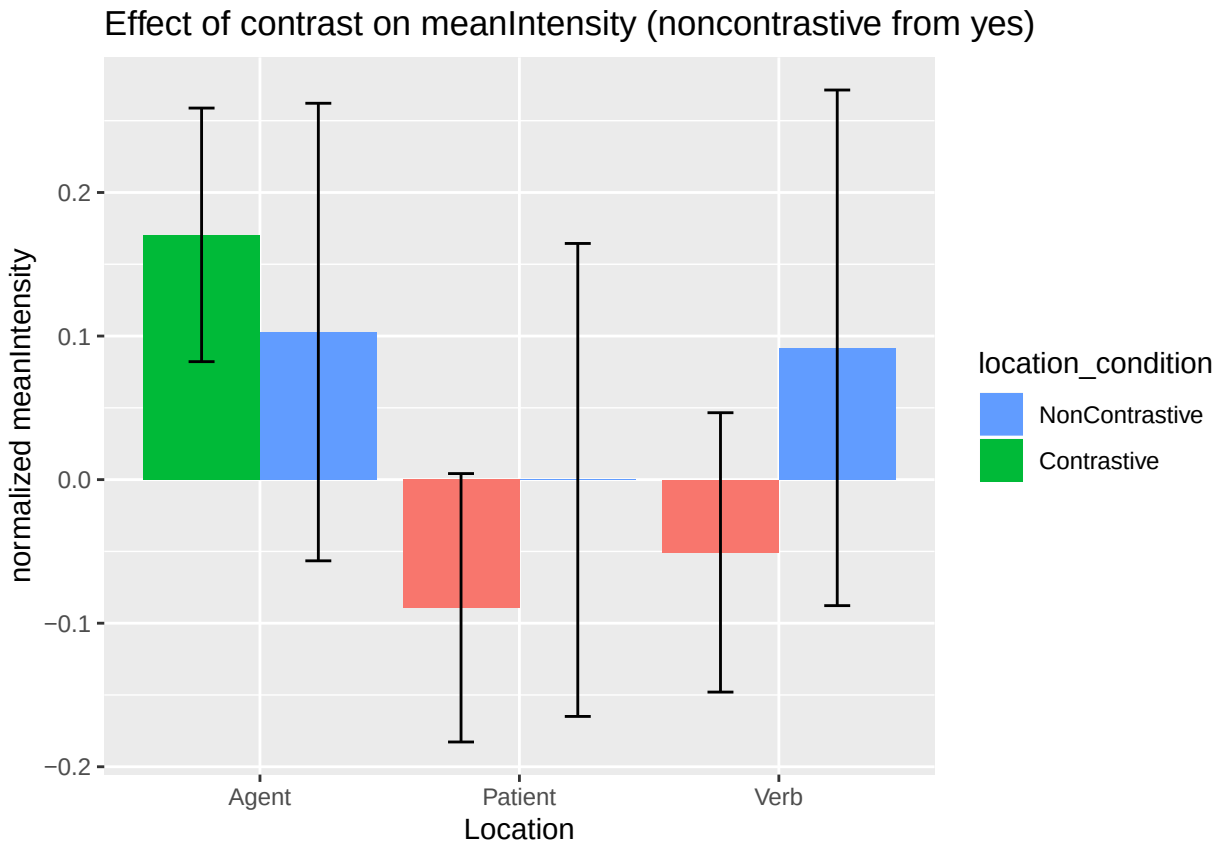
```
## The following `from` values were not present in `x`: Patient
```

```
df_Agent$Location = "Agent"
df_Verb$Location = "Verb"
df_Patient$Location = "Patient"


combined_dataset = rbind(df_Agent, df_Verb, df_Patient)

# http://www.cookbook-r.com/Graphs/Plotting_means_and_error_bars_(ggplot2)/

for (iF in features) {
    print(iF)

    summarized_dataset = summarySE(combined_dataset, measurevar = iF,
        groupvars = c("Location", "condition"))

    print(ggplot(summarized_dataset, aes(x = Location, y = get(iF),
        fill = condition)) + geom_bar(position = position_dodge(),
        stat = "identity") + geom_errorbar(aes(ymin = get(iF) -
        ci, ymax = get(iF) + ci), width = 0.2, position = position_dodge(0.9)) +
        xlab("Location") + ylab(paste0("normalized ", iF)) +
        scale_fill_hue(name = "location_condition", breaks = c("Control",
            "contrast"), labels = c("NonContrastive", "Contrastive")) +
        ggtitle(paste0("Effect of contrast on ", iF, " (noncontrastive from yes)")))
}
```

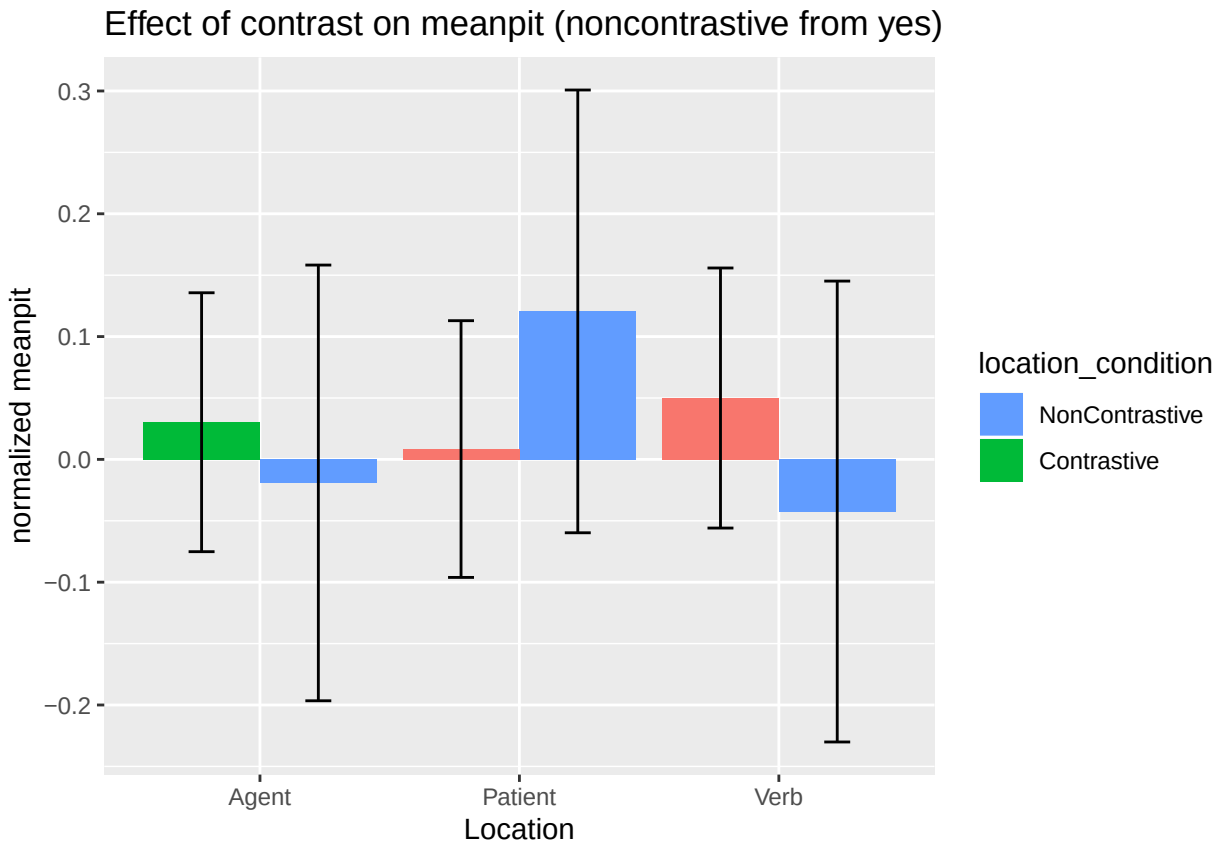
```
## [1] "duration"
```



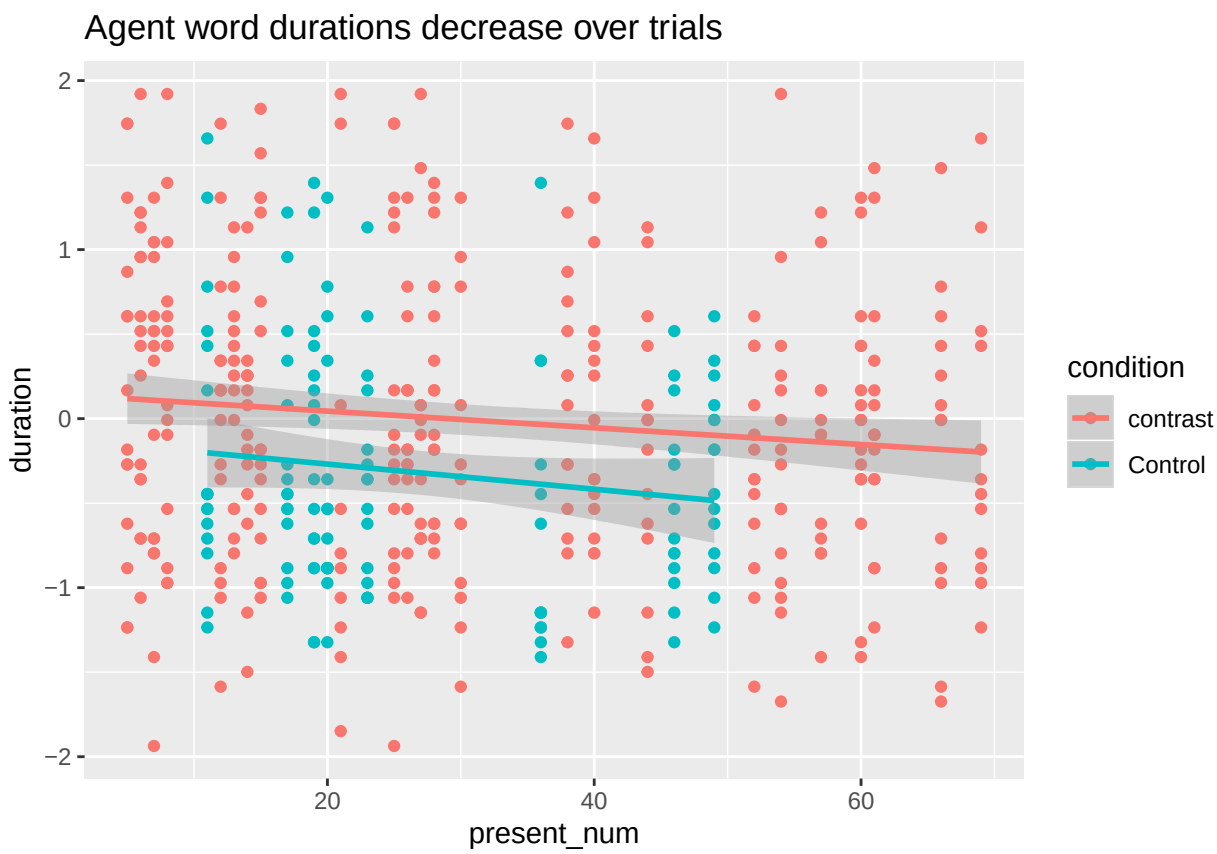

```
## [1] "meanIntensity"
```


Effect of contrast on meanIntensity (noncontrastive from yes)
normalized meanIntensity
0.2
0.1
0.0
−0.1
−0.2
Agent
Patient
Verb
Location
location_condition
NonContrastive
Contrastive

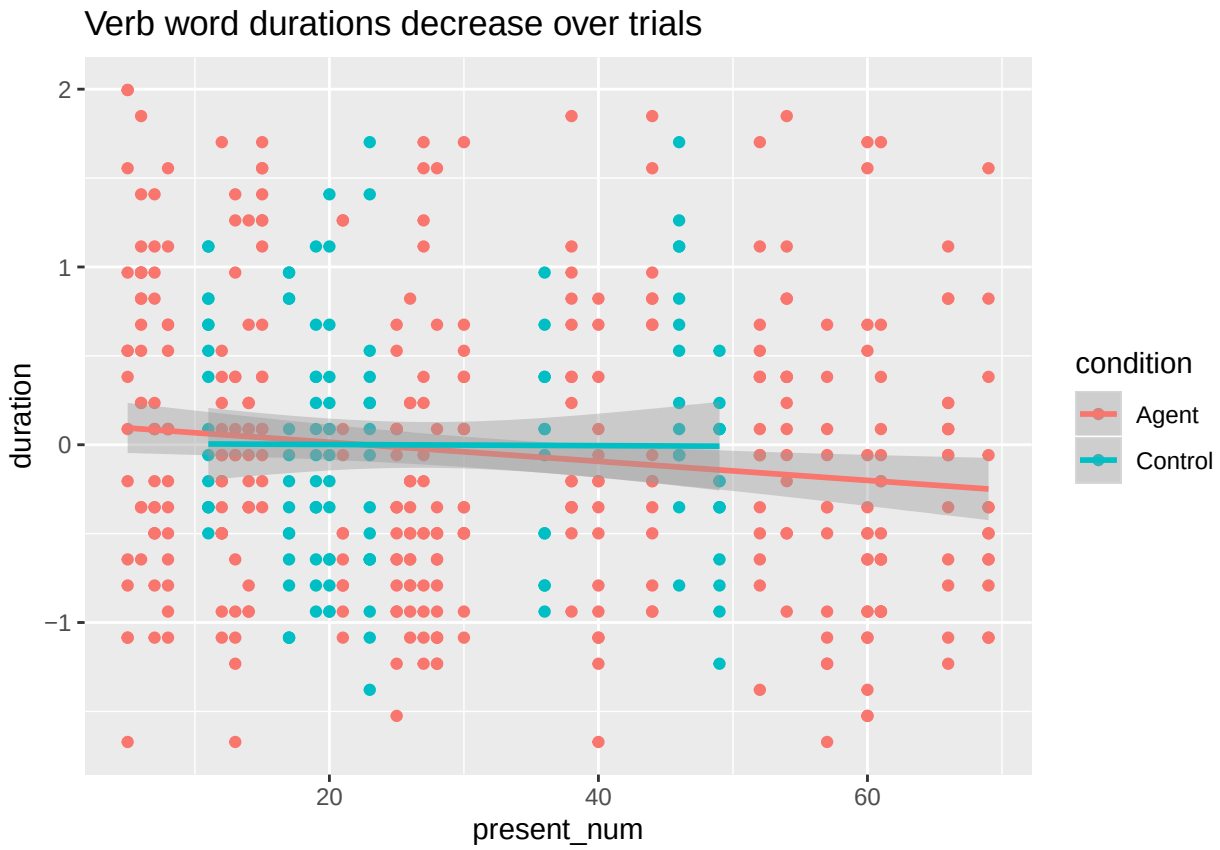
```
## [1] "meanpit"
```



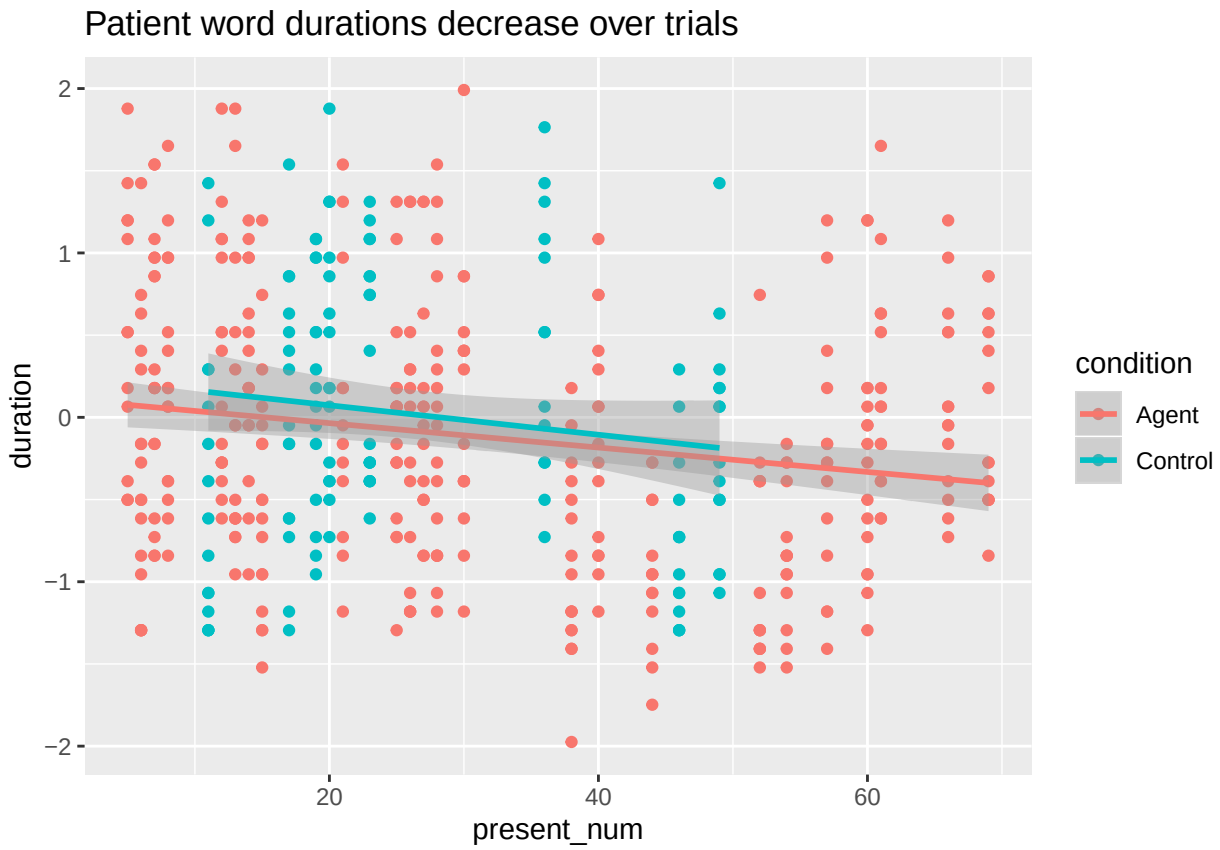

```
ggplot(df_Agent, aes(x = present_num, y = duration, color = condition)) +
    geom_point() + geom_smooth(method = lm) + ggtitle("Agent word durations decrease over trials")
```




```
ggplot(df_Verb, aes(x = present_num, y = duration, color = condition)) +
    geom_point() + geom_smooth(method = lm) + ggtitle("Verb word durations decrease over trials")
```




```
ggplot(df_Patient, aes(x = present_num, y = duration, color = condition)) +
    geom_point() + geom_smooth(method = lm) + ggtitle("Patient word durations decrease over trials")
```




**17 workers and 506 trials are included in this analysis.**

**This the analysis for exp8. The parameters of all exps can be seen at https://github.com/Xinzhu-Fang/prosody_study_exp/blob/master/tAll_exps.csv.**

**The trial-by-trial design of this exp can be seen at https://github.com/Xinzhu-Fang/prosody_study_exp/blob/master/exp8/tAll_trials.csv**

**Some code are hidden for the convenience of viewing results. Full code can be found at https://github.com/Xinzhu-Fang/prosody_study_exp/blob/master/analysis/acoustic_analysis.Rmd**

```
# for (iF in features){ run_regression('Agent',iF)
# run_regression('Patient', iF) run_regression('Verb', iF) }
# r = lmer(get(observation) ~ condition + (1 | participant) +
# (1 | verb), data=df)
```