

Auditory Mountain

July 18 2015

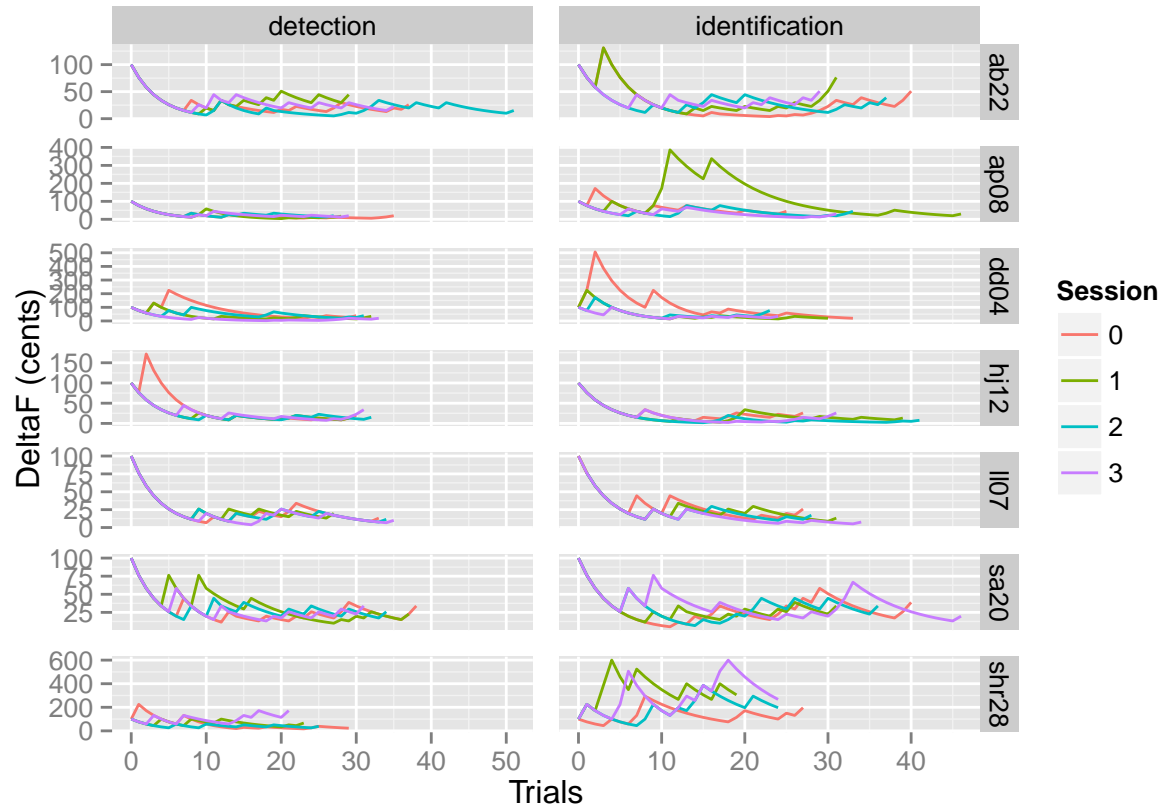
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Individual analyses

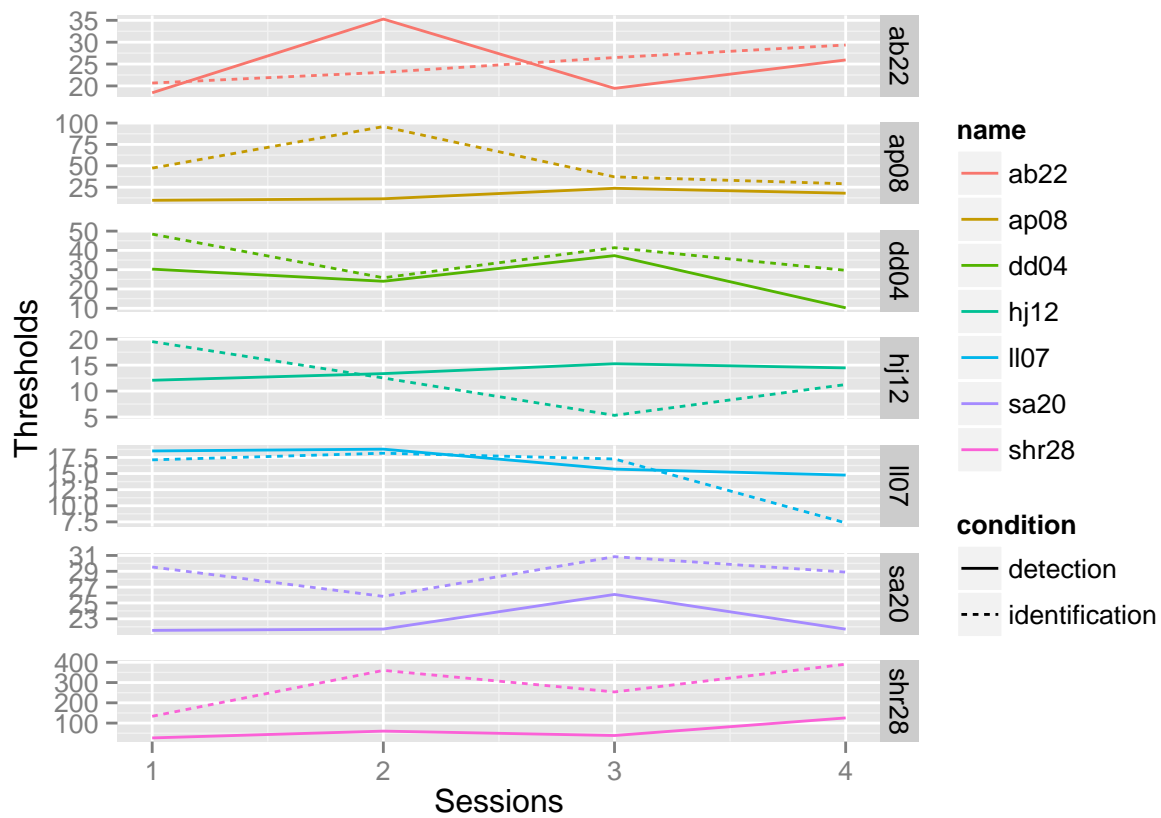
Frequency threshold task

The frequency thresholds are calculated from an adaptive procedure where ΔF is decreased when a wrong answer is provided and increased for a right answer. The evolution of the ΔF values across trials for the detection and identification tasks is plotted below:



Thresholds of each participant among sessions

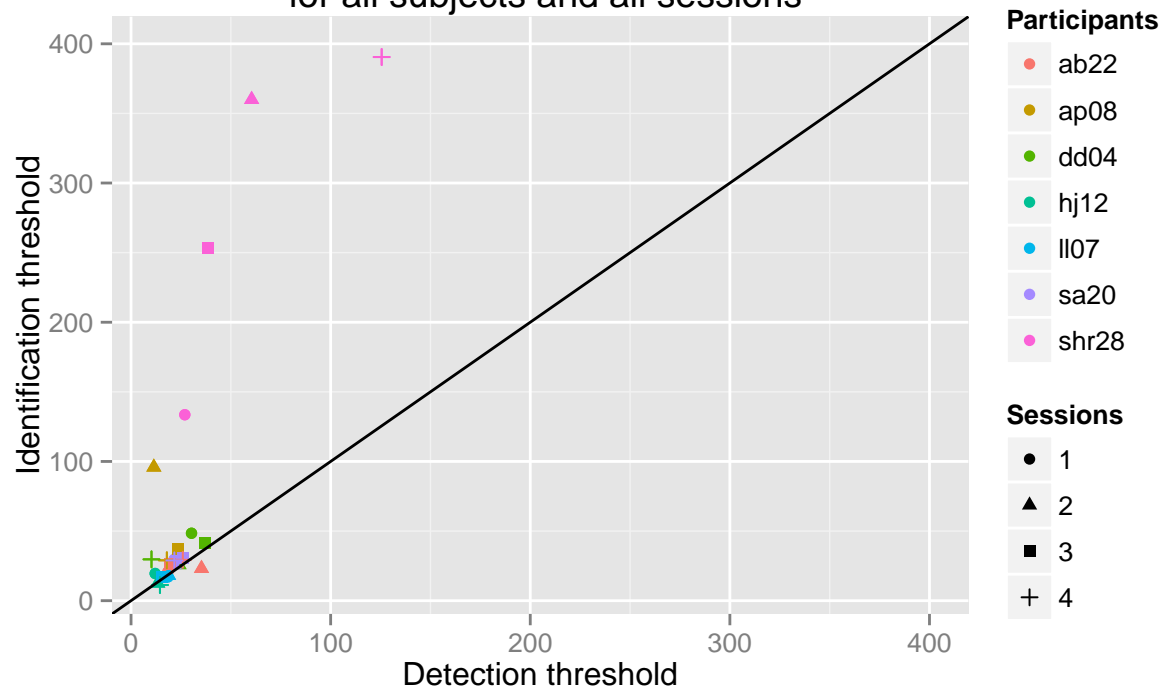
The thresholds are calculated from the DeltaF values corresponding to the last 10 reversals. The procedure was repeated two times before training (sessions 1 and 2) and two times after (sessions 3 and 4). The figure below shows these thresholds across sessions for the detection and identification conditions:



Detection threshold in function of identification threshold

Detection against identification thresholds

for all subjects and all sessions



Detection threshold in function of identification threshold pre vs. post tests

Detection threshold in function of identification threshold first vs. second tests

Auditory mountain task

Mean results (in percent error):

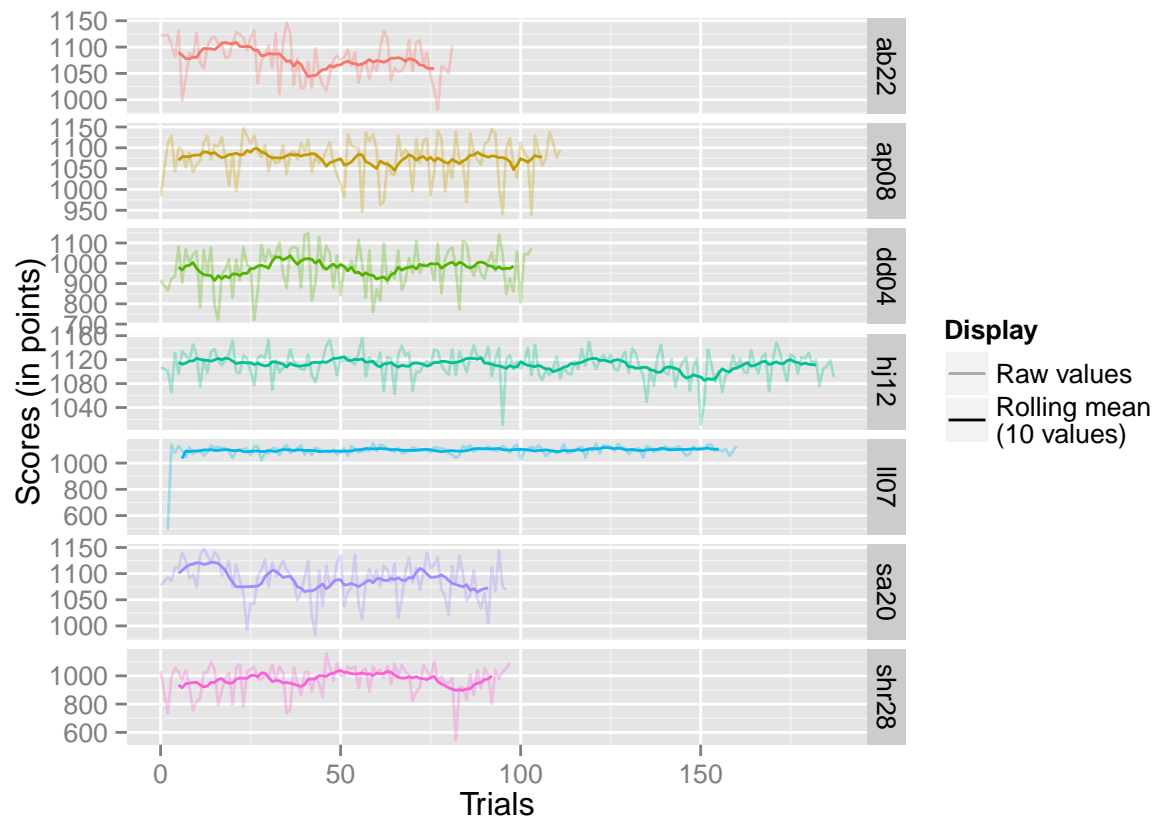
Y-axis: 2.3716389%

Here are the plots of scores, accuracy and duration in function of trials. The accuracy is the difference between the chosen tone and the highest tone. The Duration is the duration in seconds of each trial. The Score is a mixed value calculated from accuracy and duration according to this equation:

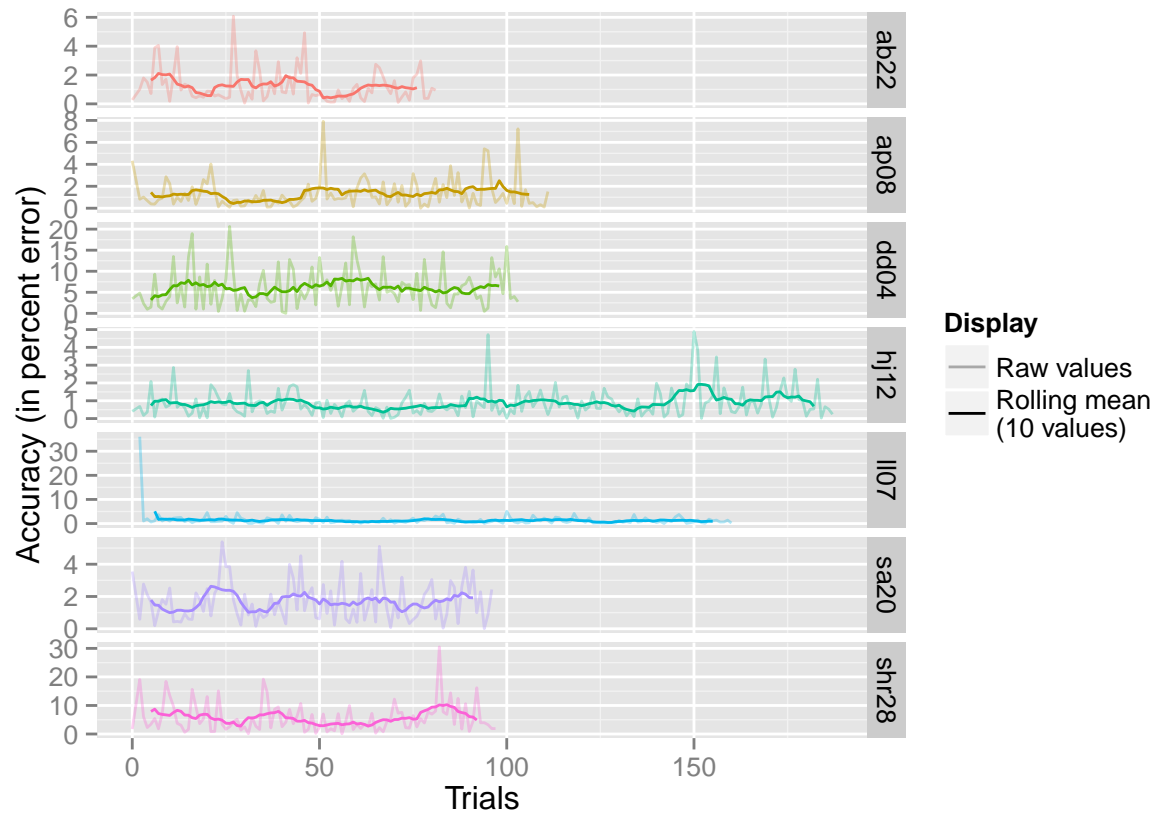
$$\left(\frac{1}{\left(\frac{duration}{100} + 1 \right)^2} + 1 \right) \times \left(\frac{600 \times accuracy}{100} \right)^2$$

With this equation the time score is a multiplier between 1 for a very long trial and 2 for a very short one (few seconds). Thus, the accuracy score can be doubled with speed. The accuracy score is 600 maximum (the idea was to make a score in order to have the pleasure to cross 1000 points when the performance is great). For accuracy and time, the power function is used to provide the maximum of points near the perfect score and have a lot of difference when it is harder.

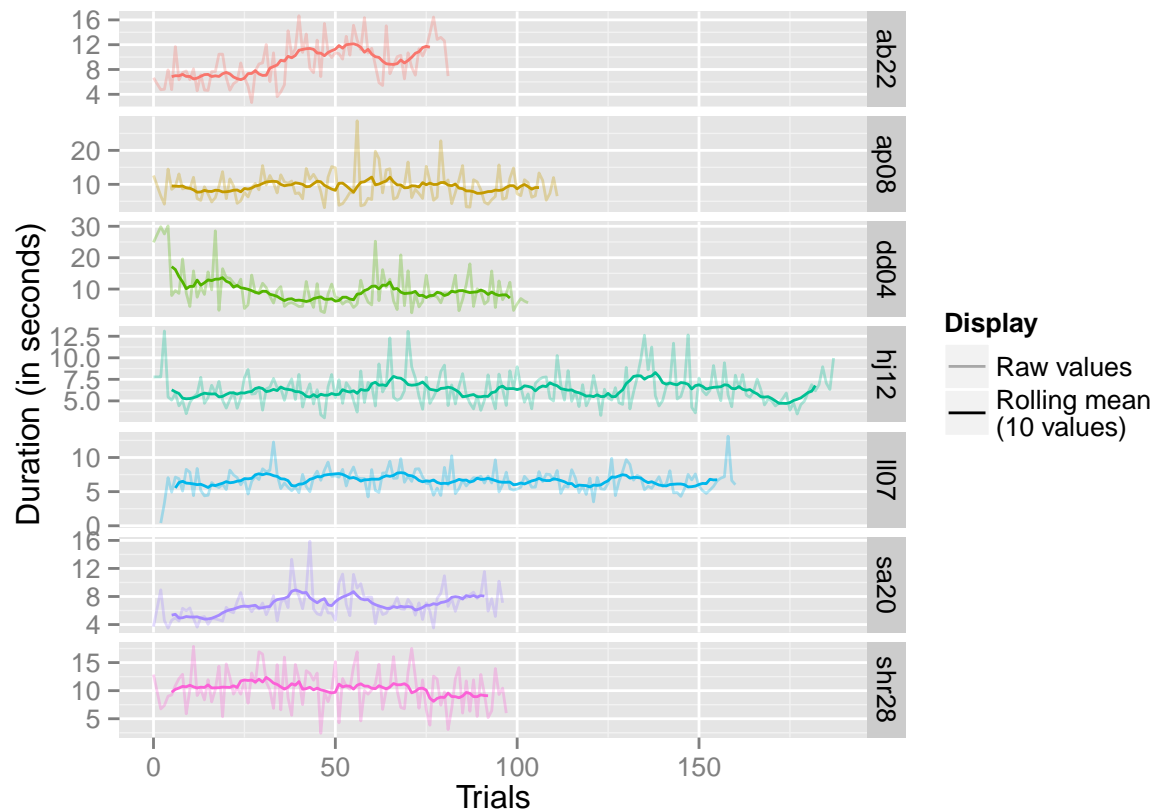
Participant's scores



Accuracy of trials

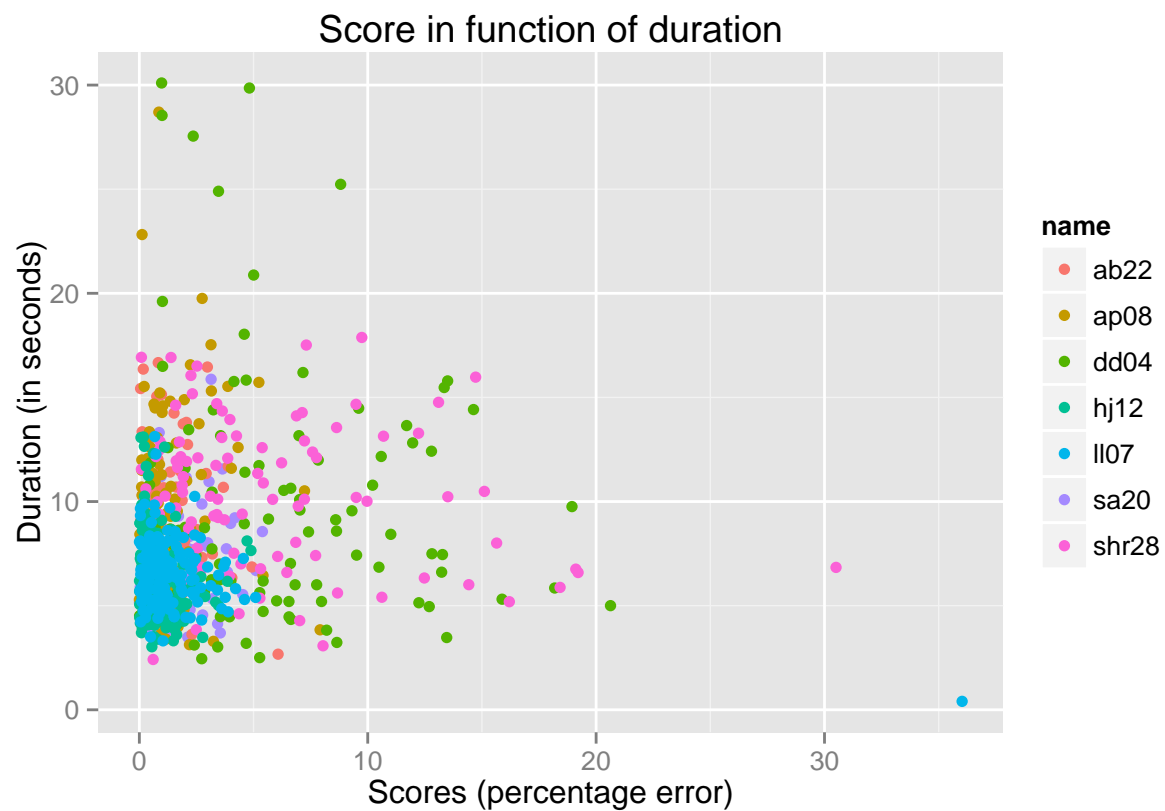


Durations of trials

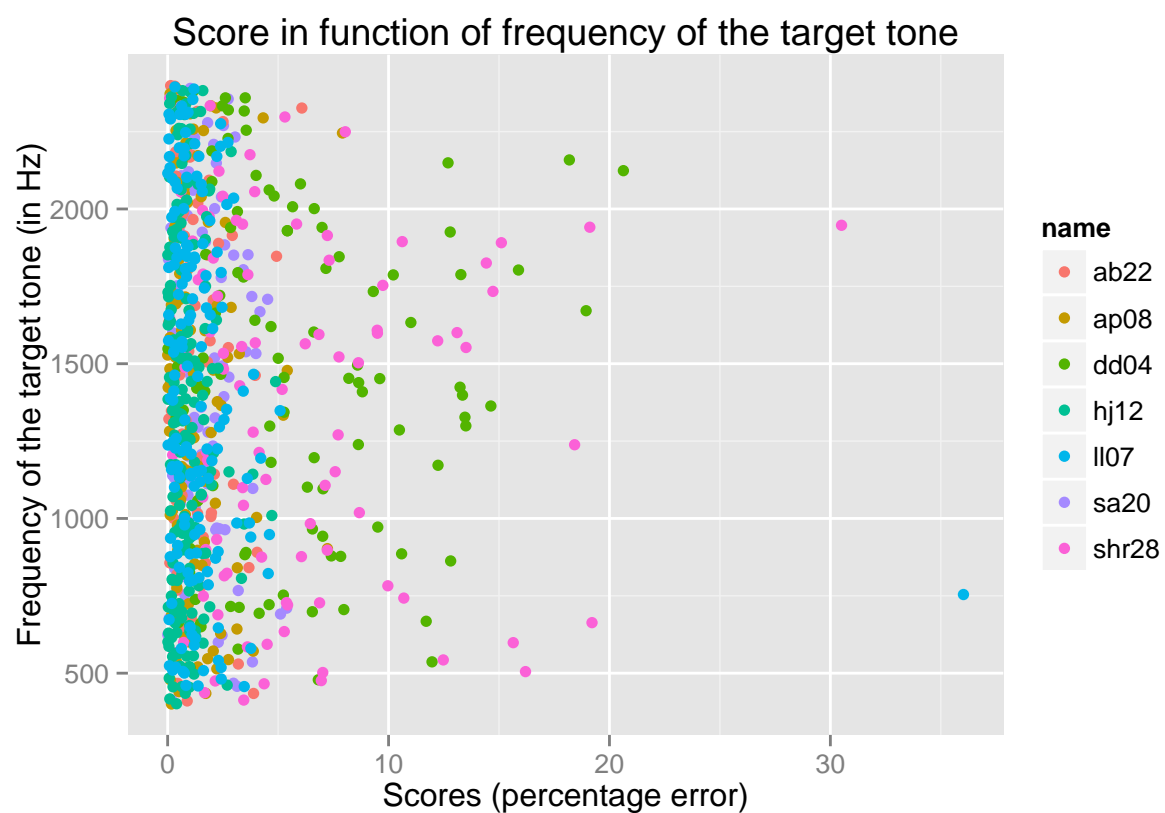


Accuracy in function of duration for each trial

Finally, to see if the variability of the results is associated with duration, here is the plot of scores against duration. Each point is a trial.

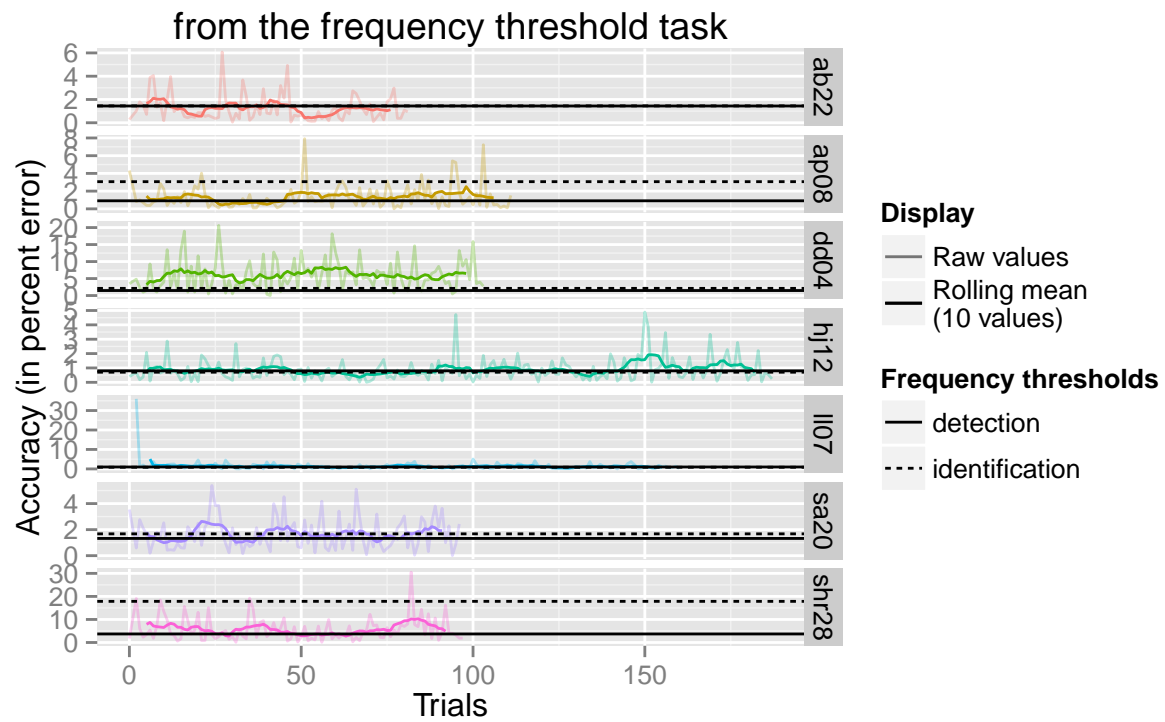


Accuracy in function of frequency of the target tone



Comparison of frequency thresholds and accuracy

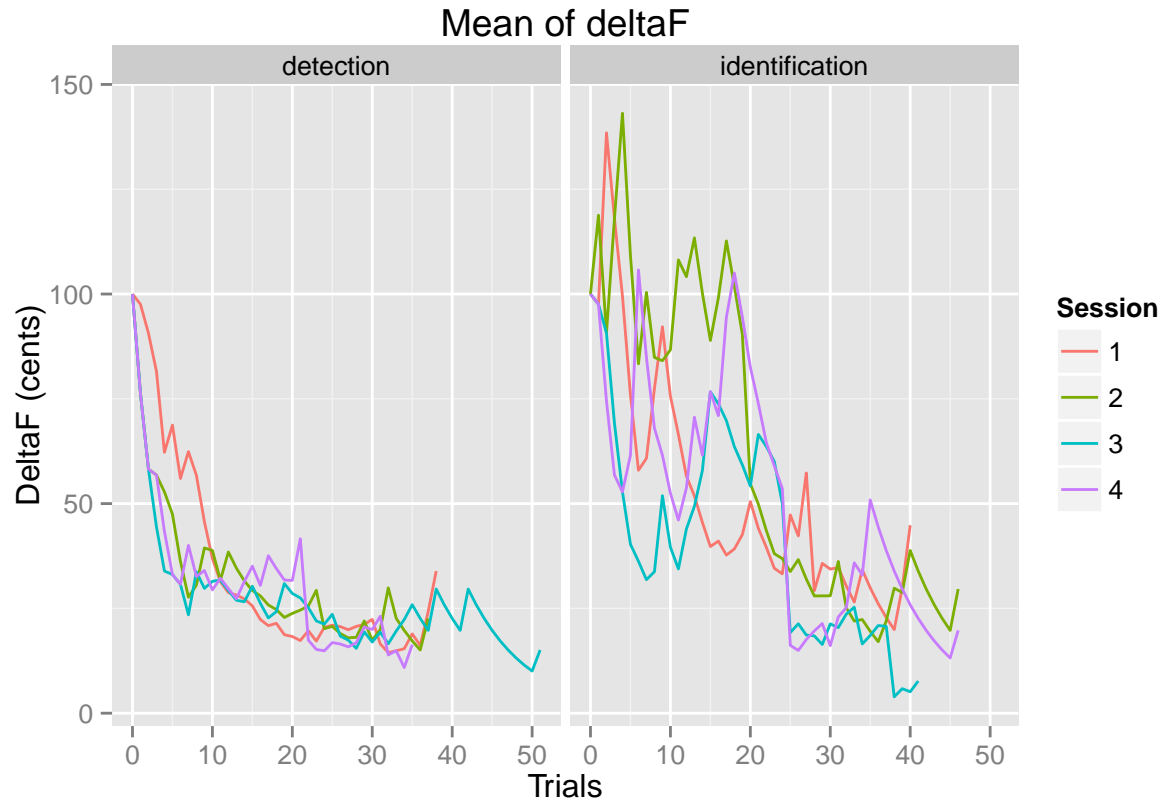
Accuracy in the mountain task with thresholds



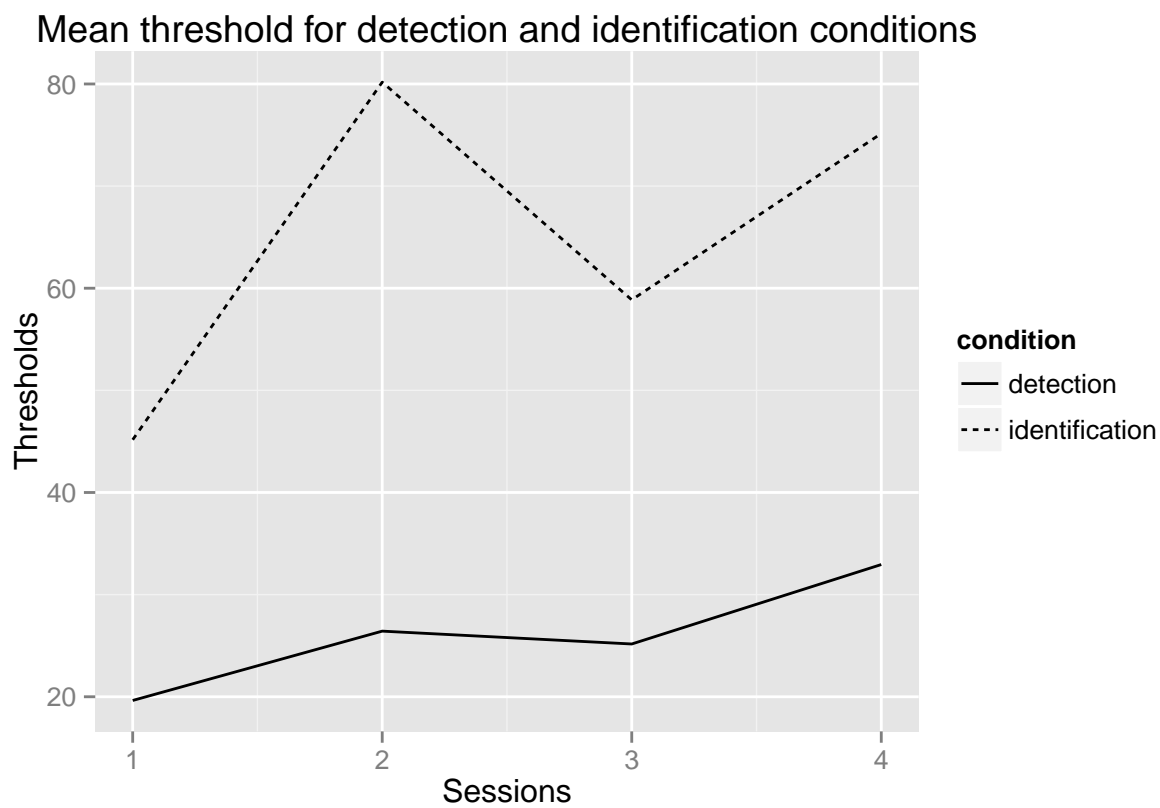
Global analyses

Frequency threshold task

Mean of deltaF in function of trials in the detection and identification task



Mean of thresholds among sessions



Session info

```
devtools::session_info()
```

```
## Session info -----
```

```
## setting value
## version R version 3.1.3 (2015-03-09)
## system x86_64, darwin13.4.0
## ui X11
## language (EN)
## collate en_US.UTF-8
## tz Europe/Paris
```

```
## Packages -----
```

```
## package * version date source
## colorspace 1.2-6 2015-03-11 CRAN (R 3.1.3)
## curl 0.9.1 2015-07-04 CRAN (R 3.1.3)
## devtools * 1.8.0 2015-05-09 CRAN (R 3.1.3)
## digest 0.6.8 2014-12-31 CRAN (R 3.1.2)
## evaluate 0.7 2015-04-21 CRAN (R 3.1.3)
## formatR 1.2 2015-04-21 CRAN (R 3.1.3)
```

```

## ggplot2      * 1.0.1   2015-03-17 CRAN (R 3.1.3)
## git2r        0.10.1   2015-05-07 CRAN (R 3.1.3)
## gridExtra    * 0.9.1   2012-08-09 CRAN (R 3.1.2)
## gtable       0.1.2   2012-12-05 CRAN (R 3.1.2)
## htmltools    0.2.6   2014-09-08 CRAN (R 3.1.2)
## jsonlite     0.9.16   2015-04-11 CRAN (R 3.1.3)
## knitr        1.10.5   2015-05-06 CRAN (R 3.1.3)
## labeling     0.3      2014-08-23 CRAN (R 3.1.2)
## lattice      0.20-30  2015-02-22 CRAN (R 3.1.3)
## magrittr     1.5      2014-11-22 CRAN (R 3.1.2)
## MASS         7.3-39   2015-02-24 CRAN (R 3.1.3)
## memoise      0.2.1   2014-04-22 CRAN (R 3.1.2)
## munsell      0.4.2   2013-07-11 CRAN (R 3.1.2)
## plyr         1.8.3   2015-06-12 CRAN (R 3.1.3)
## proto        0.3-10   2012-12-22 CRAN (R 3.1.2)
## RColorBrewer * 1.1-2   2014-12-07 CRAN (R 3.1.2)
## Rcpp         0.11.6   2015-05-01 CRAN (R 3.1.3)
## reshape2    * 1.4.1   2014-12-06 CRAN (R 3.1.2)
## rjson        * 0.2.15  2014-11-03 CRAN (R 3.1.2)
## rmarkdown    0.5.1   2015-01-26 CRAN (R 3.1.2)
## rstudioapi   0.3.1   2015-04-07 CRAN (R 3.1.3)
## rversions    1.0.1   2015-06-06 CRAN (R 3.1.3)
## scales      * 0.2.5   2015-06-12 CRAN (R 3.1.3)
## stringi      0.4-1   2014-12-14 CRAN (R 3.1.2)
## stringr      1.0.0   2015-04-30 CRAN (R 3.1.3)
## xml2         0.1.1   2015-06-02 CRAN (R 3.1.3)
## yaml         2.1.13  2014-06-12 CRAN (R 3.1.2)
## zoo          * 1.7-12  2015-03-16 CRAN (R 3.1.3)

```