Synchrony in Psychotherapy, example with F1044 patient data

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Contents

```
rm(list = ls(all.names = TRUE))
```

```
setwd("/Users/Ofix/Documents/Fac/internat/Recherche/projets/synchro/synchroData/Git/INCANT/Reports/")
```

Import data

```
data <- importdata(fullNameList)
```

Lists

Functions list

MeanMotionByTime

Function that takes raw motion history data and compute the mean on a given interval. Intervals don't overlap, so the frequency of the data change (from 25 frames by seconde to 25 frames/interval by second).

Arguments:

- subject : Subject studied (patient, mother, father or therapist)
- indexOfvideos : List of videos studied (element eg 3 or list eg 1:3 or c(1,2,4))
- interval : number of frames in the studied interval
- data : data frame where there is data

```
## Revoir nom des variables : pas clair, faire un schéma
MeanMotionByTime <- function(subject, indexOfvideos=1:NumberOfvideos, interval, data){
  x <- c()
  for (file in indexList[indexOfvideos]){
        dataVector <- data[which(data$indexList==file), subject]
        ## with ceiling : superior limit of the round
        IntervalNumbersVideo <- ceiling(length(dataVector)/interval)
        for (i in 1:IntervalNumbersVideo){
                borneinf<- 1+(i-1)*interval
                bornesup <-i*interval
                dataVectorInterval <- dataVector[borneinf:bornesup]
                mean <- mean(dataVectorInterval, na.rm=TRUE)
                x <- c(x, mean)}}
  return (x)}
```

Slidinginterval

Function that takes raw motion history data and compute the mean on a given interval. The interval overlap, so the frequency of the data don't change. It stays at 25 frames/s.

Arguments:

- subject : subject studied (patient, mother, father or therapist)
- indexOfvideos : list of videos studied (element eg. 3 or list eg 1:3 or c(1,2,4))
- interval : number of frames in the studied interval
- data : data frame where there is data

```
## faire un schéma
SlidingInterval <- function(subject, indexOfvideos=1:NumberOfvideos, interval, data)
  {x <- c()
  for (file in indexList[indexOfvideos]){
      dataVector <- data[which(data$indexList==file), subject]
      NBofAnalysedFrames <- length(dataVector)-interval+1
          for (i in 1:NBofAnalysedFrames){
              borneinf<- (i)
              bornesup <-(interval-1+i)
              dataVectorInterval <- dataVector[borneinf:bornesup]
              mean <- mean(dataVectorInterval, na.rm=TRUE)
              x <- c(x, mean)}}
  return (x)}
```

MeanSynchronyByTime (TODO)

Constants generated from data and defining it (data list,)

```
labelvideolist  <-c()
for (i in indexList){
    a <- str_count(i)
    name <- substr(i, 6, a)
    labelvideolist <- c(labelvideolist, name)
}

FilesName <- data.frame(unique(data$file), filesList, indexList, labelvideolist)
NumberOfvideos <- length(indexList)
```

Merge data frame, compute Time in minutes, compute log of motion history dataframe

```
data <- merge(data, FilesName, by.x="file", by.y="unique.data.file.", all=TRUE)
data$timeMin <- data$frame/(25*60)

data$fatherShifted <- data$father + min(data$father[which (data$father >0)])/2
data$logFather <- log(data$fatherShifted)

#log(x -min(x)+1)
data$motherShifted <- data$mother + min(data$mother[which (data$mother >0)])/2
data$logMother <- log(data$motherShifted)

data$patientShifted <- data$patient + min(data$patient[which (data$patient >0)])/2
data$logPatient <- log(data$patientShifted)

data$therapistShifted <- data$therapist + min(data$therapist[which (data$therapist >0)])/2
```

```
data$logTherapist <- log(data$therapistShifted)

# Name of the patient (anonymised)
data$family  <- substr (data$indexList, 1, 5)

famList <- unique(data$family)

# Add date TODO

data$file <- NULL
data$filesList <- NULL

# Reorganize the data frame
data <- data[c("family", "indexList", "labelvideolist", "frame", "timeMin", "father", "fatherShifted",
```

- Time in minutes The timeMin is calculated with a frame rate of 25/sec.
- Motion history distribution The data is not normal at all but with very small movement very frequent and bigger movement much rare with a long tail.

To normalize the distribution to compute synchrony scores on it, we made the Napierian logarithm. It produces negative numbers. SyncPy can't compute negatives scores, they are so shifted to positives values with an arbitrary value of 20 to avoid to keep extreme negative values.

Values equal to 0 can't be loged. They generate a -Inf value. These values are set to NA. We lose the information of no movement at all. If we give a arbitrary value to this data (eg, the minimum value, they are over represented)

Presentation of the data

```
str(data)
```

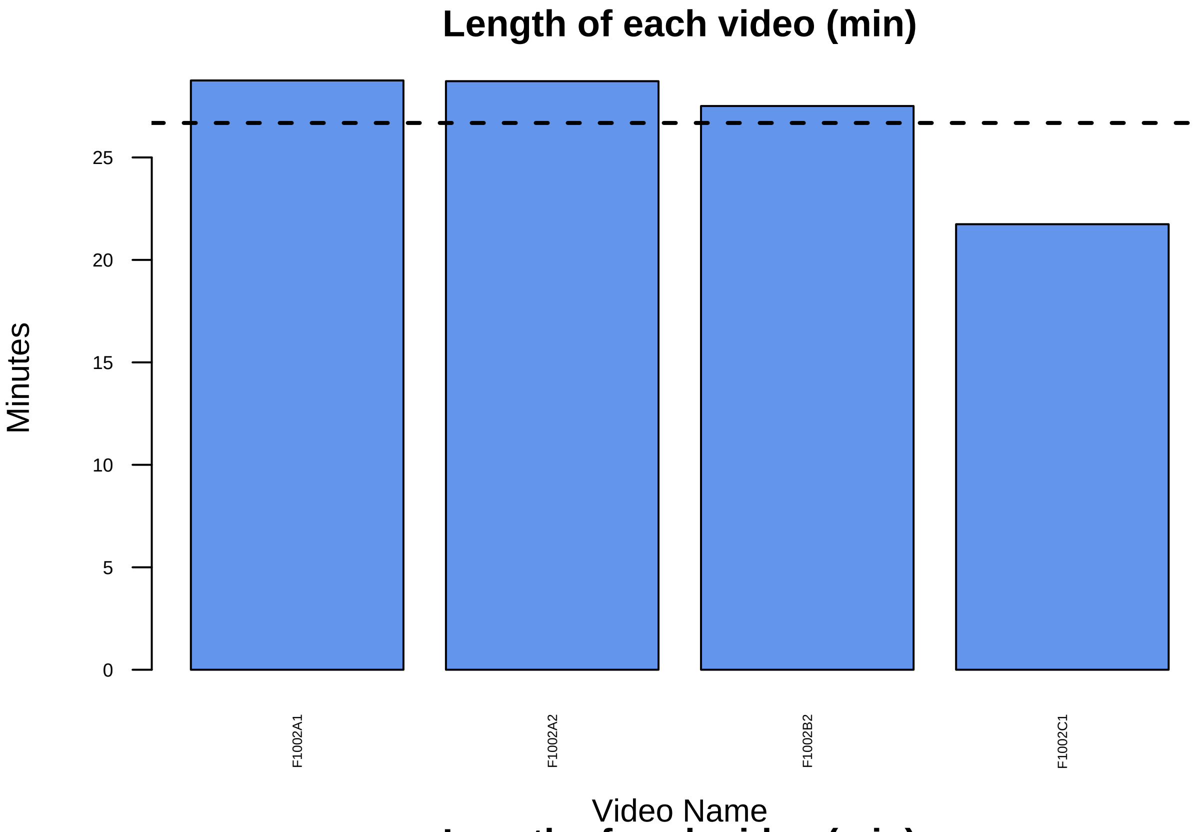
```
## 'data.frame':    948687 obs. of  17 variables:
##  $ family          : chr  "F1002" "F1002" "F1002" "F1002" ...
##  $ indexList       : Factor w/ 41 levels "F1002A1","F1002A2",..: 1 1 1 1 1 1 1 1 1 1 ...
##  $ labelvideolist  : Factor w/ 30 levels "A1","A2","B1",..: 1 1 1 1 1 1 1 1 1 1 ...
##  $ frame           : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ timeMin         : num  0.000667 0.001333 0.002 0.002667 0.003333 ...
##  $ father          : num  0.004025 0.002826 0.00207 0.002267 0.000821 ...
##  $ fatherShifted   : num  0.004032 0.002833 0.002077 0.002274 0.000829 ...
##  $ logFather       : num  -5.51 -5.87 -6.18 -6.09 -7.1 ...
##  $ mother          : num  0.0789 0.0764 0.0769 0.0794 0.0799 ...
##  $ motherShifted   : num  0.0789 0.0764 0.0769 0.0794 0.0799 ...
##  $ logMother       : num  -2.54 -2.57 -2.56 -2.53 -2.53 ...
##  $ patient         : num  NA NA NA NA NA NA NA NA NA NA ...
##  $ patientShifted  : num  NA NA NA NA NA NA NA NA NA NA ...
##  $ logPatient      : num  NA NA NA NA NA NA NA NA NA NA ...
##  $ therapist       : num  4.24e-05 0.00 0.00 4.24e-05 0.00 ...
##  $ therapistShifted: num  6.37e-05 2.12e-05 2.12e-05 6.37e-05 2.12e-05 ...
##  $ logTherapist    : num  -9.66 -10.76 -10.76 -9.66 -10.76 ...
```

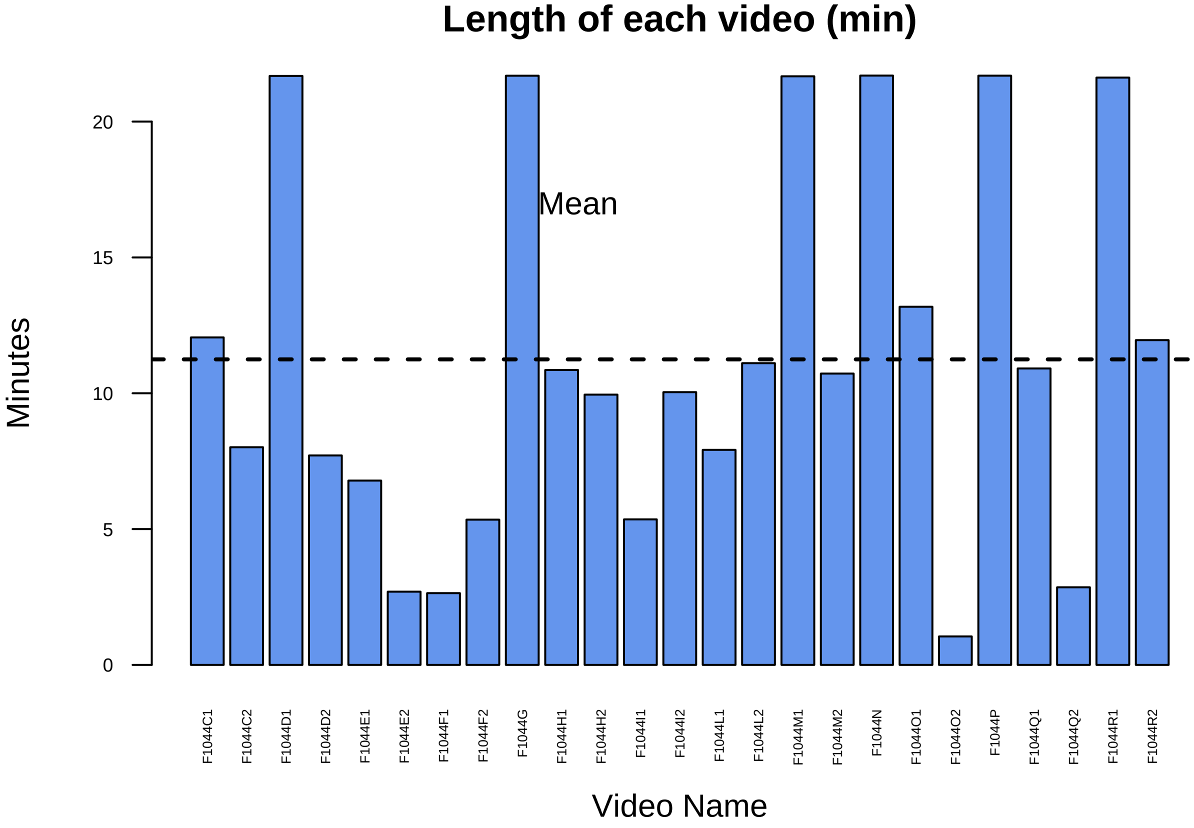
```
summary(data)
```

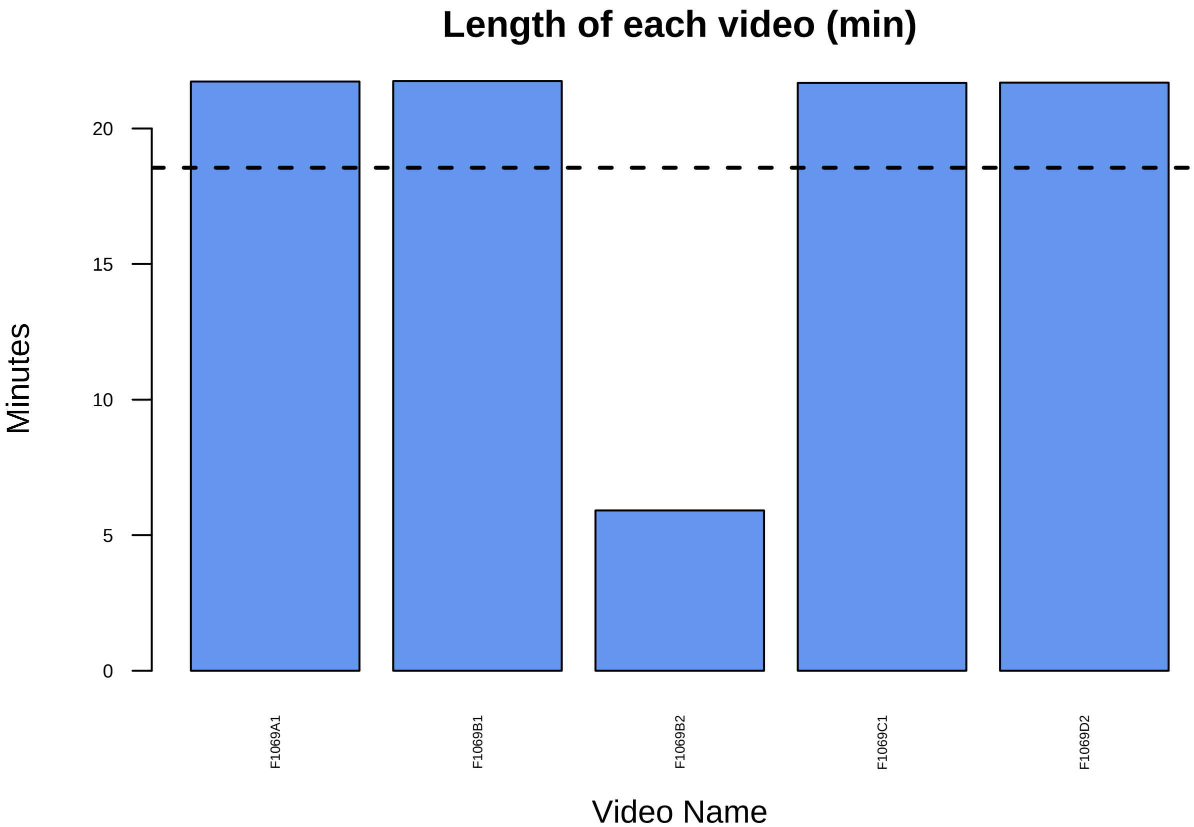
```
##     family            indexList      labelvideolist       frame
##  Length:948687      F1002A1: 43136   A1     :108371   Min.   :    1
##  Class :character   F1002A2: 43082   A2     :107700   1st Qu.: 6036
##  Mode  :character   F1002B2: 41265   C1     : 83216   Median :12998
##                     F1073B1: 32832   B2     : 82648   Mean   :14660
##                     F1101A2: 32641   B1     : 65453   3rd Qu.:22663
##                     F1073A1: 32637   C2     : 44538   Max.   :43136
##                     (Other):723094   (Other):456761
##     timeMin              father       fatherShifted      logFather
##  Min.   : 0.000667   Min.   :0.0      Min.   :0.0      Min.   :-11.8
##  1st Qu.: 4.024000   1st Qu.:0.0      1st Qu.:0.0      1st Qu.:-11.8
##  Median : 8.665333   Median :0.0      Median :0.0      Median : -9.0
##  Mean   : 9.773022   Mean   :0.0      Mean   :0.0      Mean   : -8.5
##  3rd Qu.:15.108667   3rd Qu.:0.0      3rd Qu.:0.0      3rd Qu.: -5.8
##  Max.   :28.757333   Max.   :0.3      Max.   :0.3      Max.   : -1.3
##                      NA's   :593390   NA's   :593390   NA's   :593390
##      mother       motherShifted      logMother         patient
##  Min.   :0.00     Min.   :0.00     Min.   :-11.99   Min.   :0.0
##  1st Qu.:0.00     1st Qu.:0.00     1st Qu.:-10.66   1st Qu.:0.0
##  Median :0.00     Median :0.00     Median : -8.55   Median :0.0
##  Mean   :0.01     Mean   :0.01     Mean   : -8.26   Mean   :0.0
##  3rd Qu.:0.00     3rd Qu.:0.00     3rd Qu.: -5.64   3rd Qu.:0.0
##  Max.   :0.41     Max.   :0.41     Max.   : -0.88   Max.   :0.3
##  NA's   :218579   NA's   :218579   NA's   :218579   NA's   :330670
##  patientShifted     logPatient       therapist      therapistShifted
##  Min.   :0.0      Min.   :-12.1    Min.   :0.0      Min.   :0.0
##  1st Qu.:0.0      1st Qu.: -9.9    1st Qu.:0.0      1st Qu.:0.0
##  Median :0.0      Median : -6.8    Median :0.0      Median :0.0
##  Mean   :0.0      Mean   : -7.4    Mean   :0.0      Mean   :0.0
##  3rd Qu.:0.0      3rd Qu.: -4.9    3rd Qu.:0.0      3rd Qu.:0.0
##  Max.   :0.3      Max.   : -1.3    Max.   :0.3      Max.   :0.3
##  NA's   :330670   NA's   :330670   NA's   :123359   NA's   :123359
##   logTherapist
##  Min.   :-10.76
##  1st Qu.: -7.61
##  Median : -6.06
##  Mean   : -6.73
##  3rd Qu.: -5.48
##  Max.   : -1.20
##  NA's   :123359
```

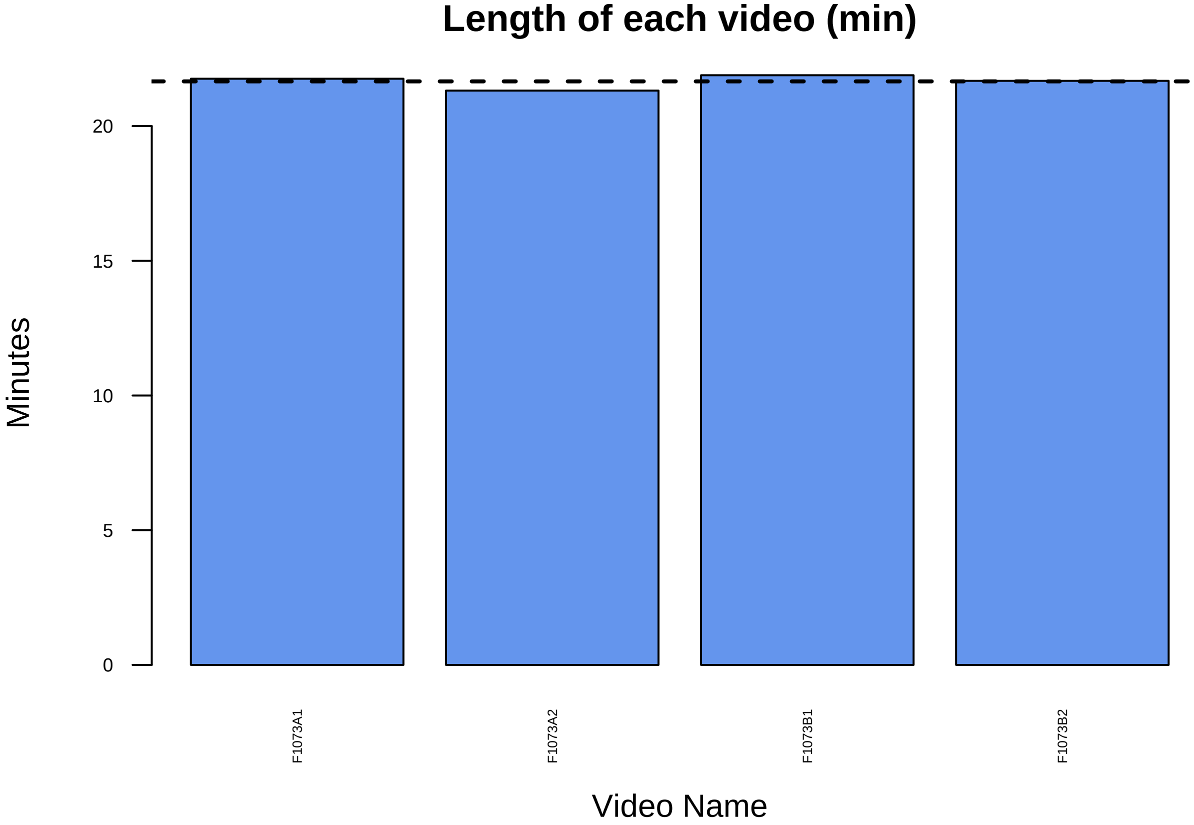
```
View(data)
```

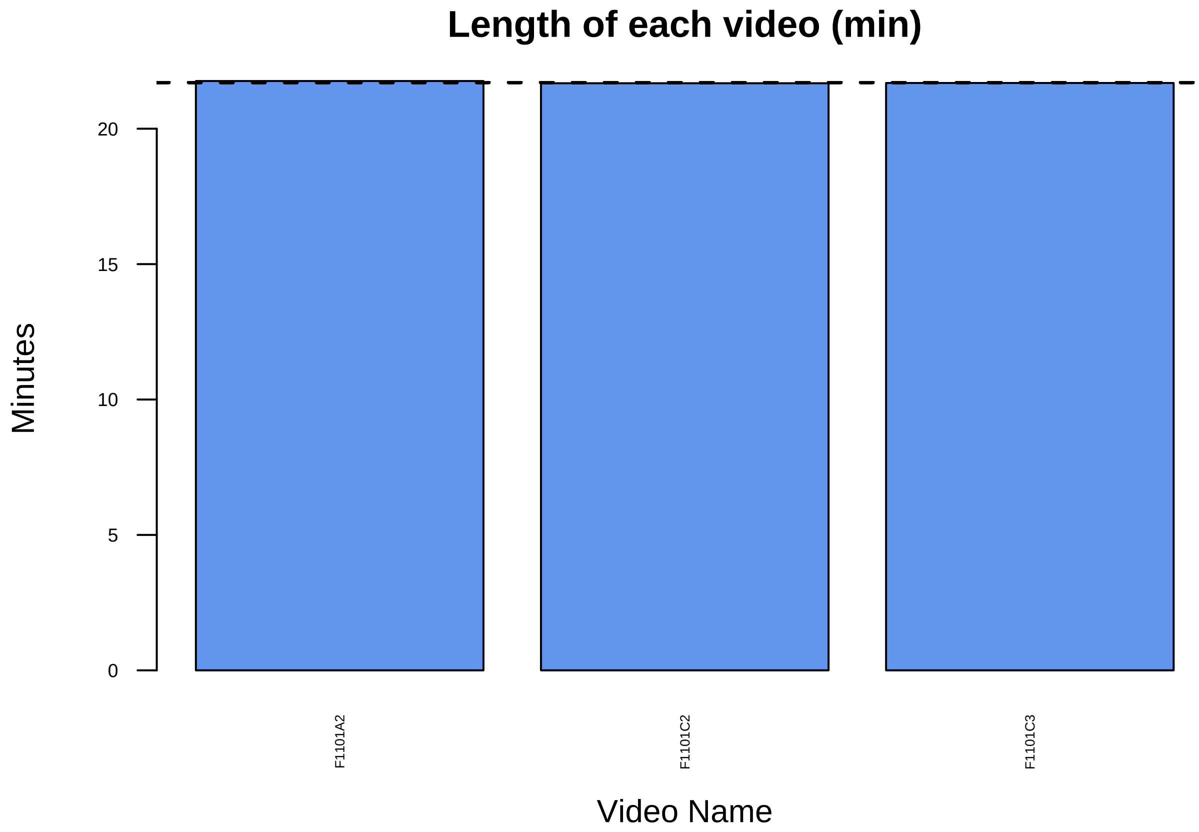
Length of the videos in minutes



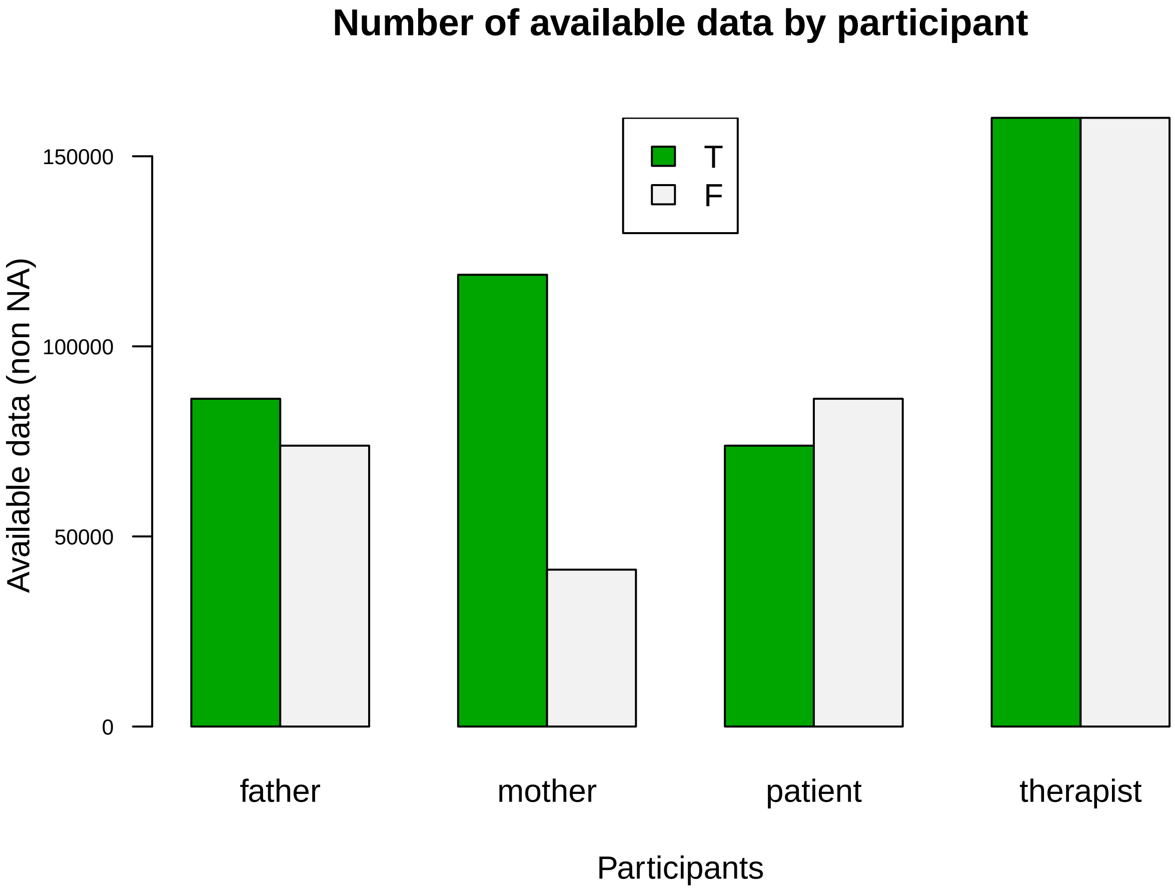


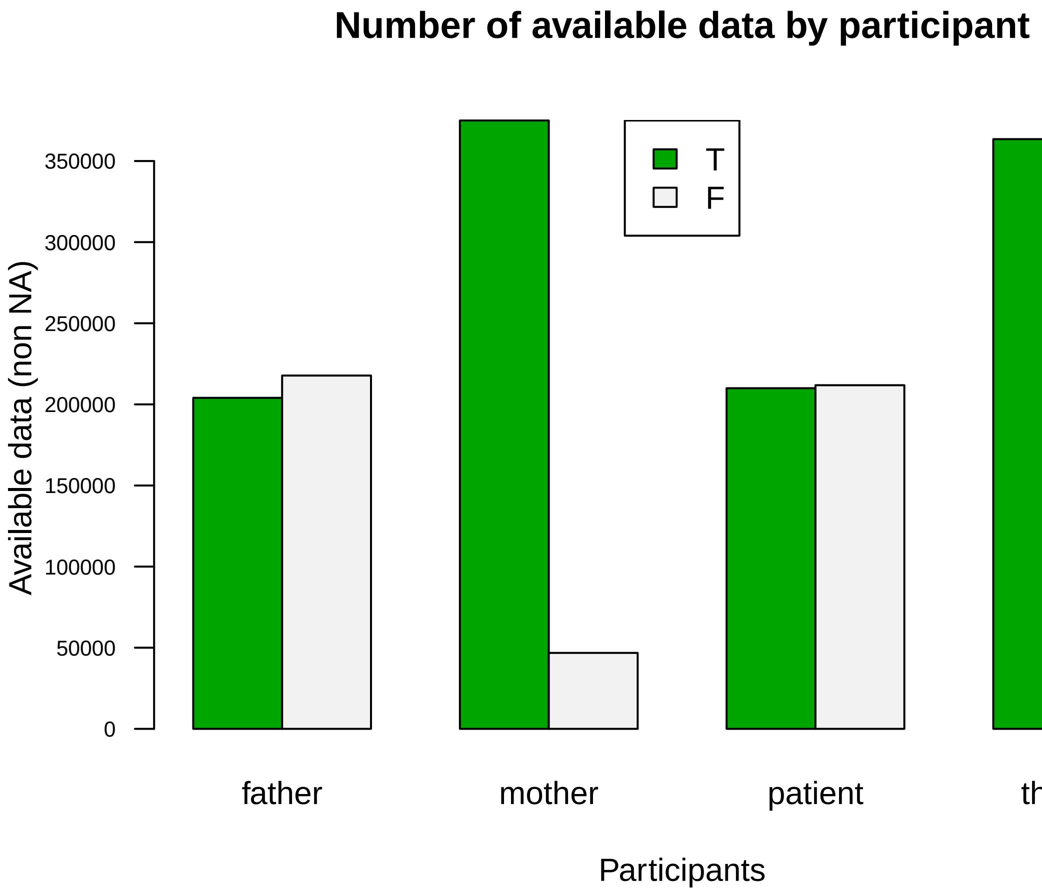

Length of each video (min)
Minutes
0
5
10
15
20
F1069A1
F1069B1
F1069B2
F1069C1
F1069D2
Video Name

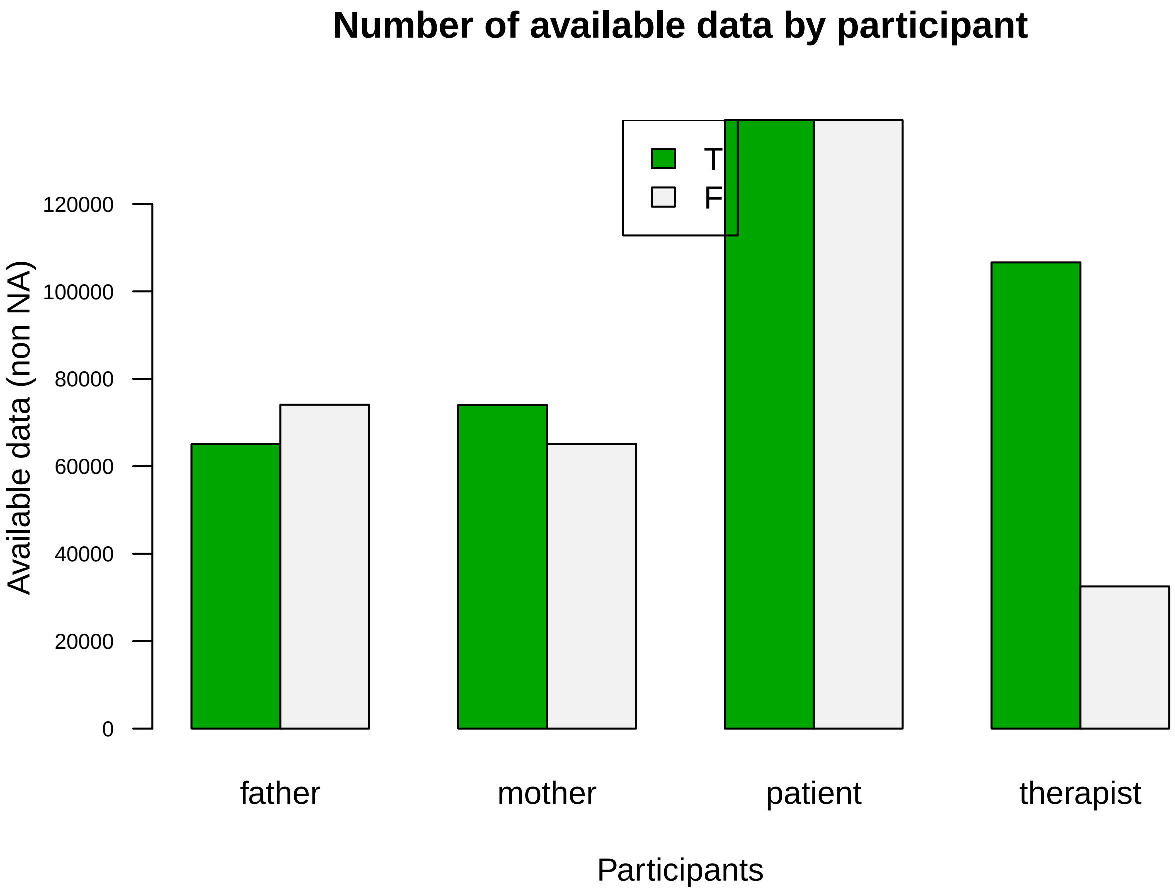

Length of each video (min)
Minutes
0
5
10
15
20
F1073A1
F1073A2
F1073B1
F1073B2
Video Name

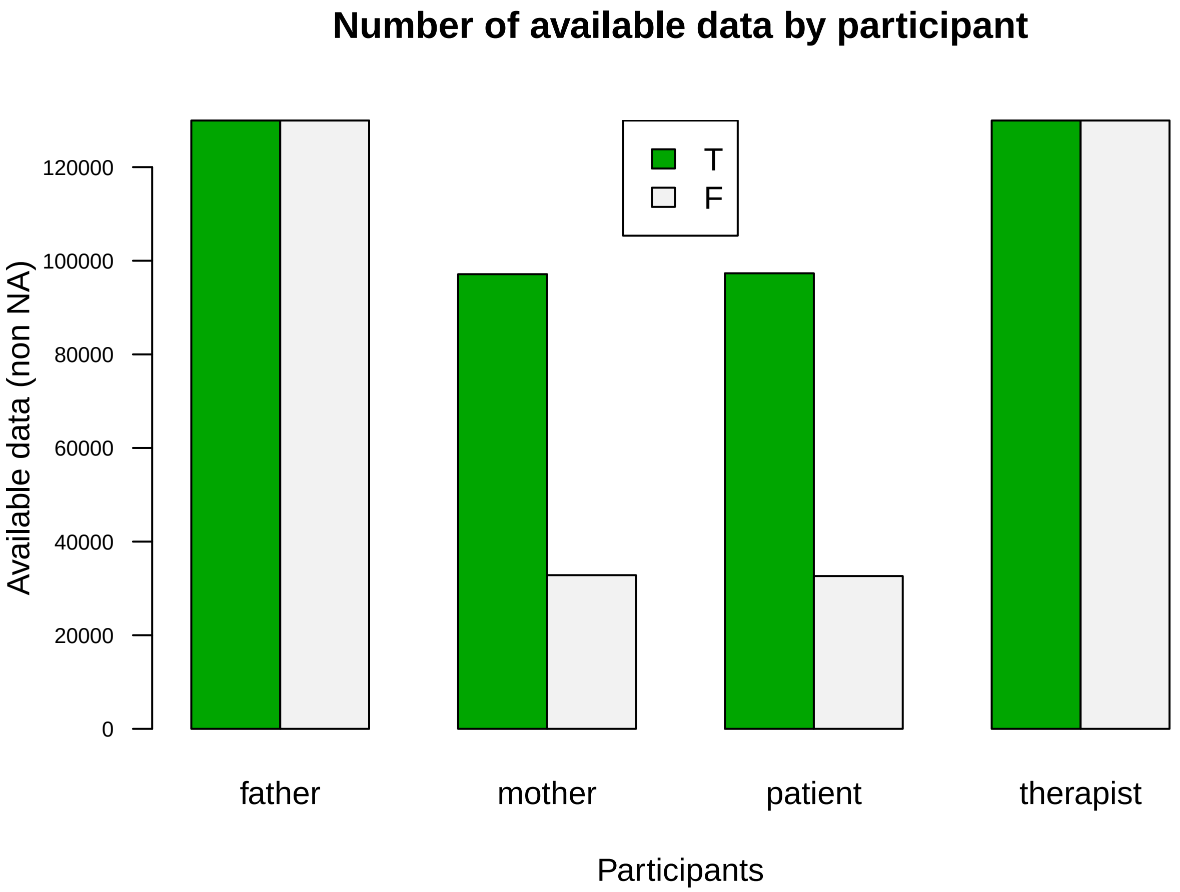

Length of each video (min)
Minutes
0
5
10
15
20
F1101A2
F1101C2
F1101C3
Video Name

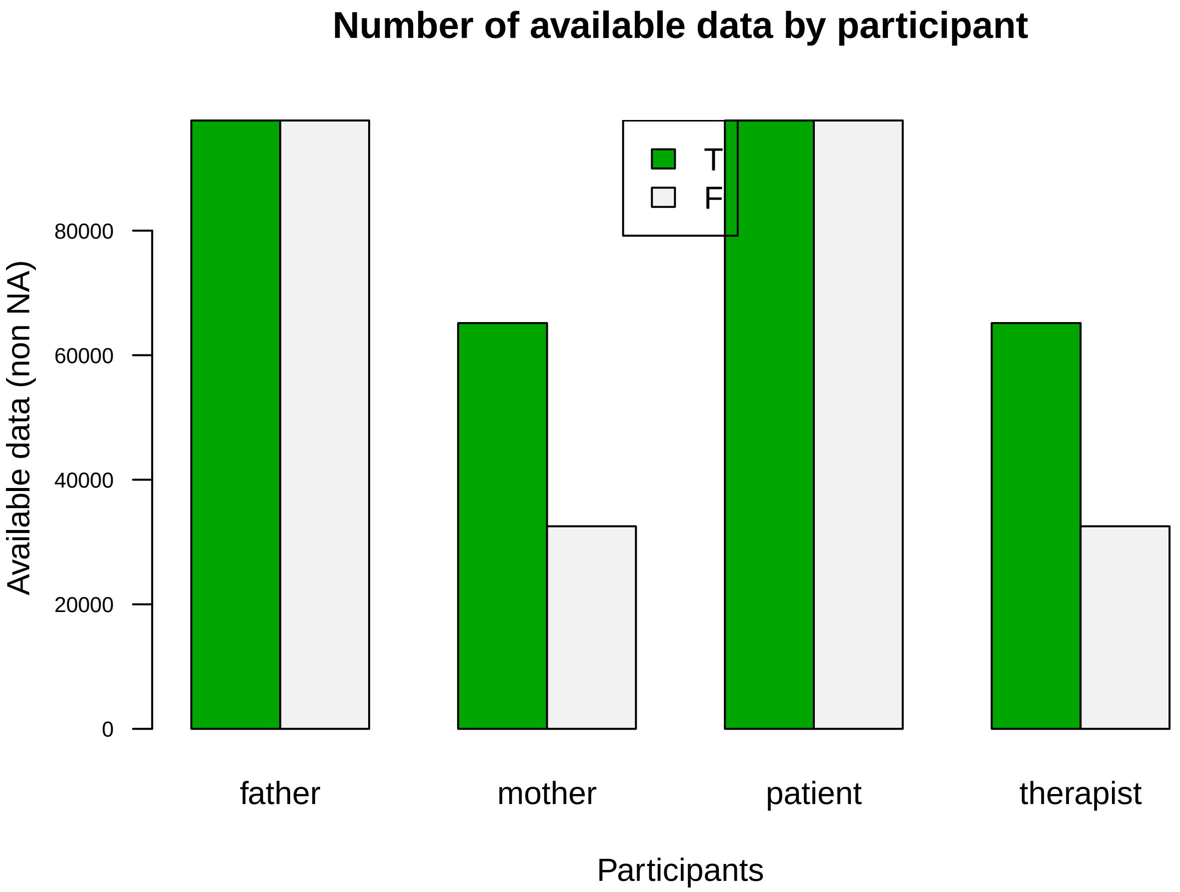
Number of Available (True) and Not Available (False) data for each participant




Number of available data by participant
T
F
Available data (non NA)
350000
300000
250000
200000
150000
100000
50000
0
father
mother
patient
therapist
Participants


Number of available data by participant
T
F
120000
100000
80000
60000
40000
20000
0
Available data (non NA)
father
mother
patient
therapist
Participants


Number of available data by participant
Available data (non NA)
0
20000
40000
60000
80000
100000
120000
T
F
father
mother
patient
therapist
Participants



Global Motion history

Mean Motion history by video by participant

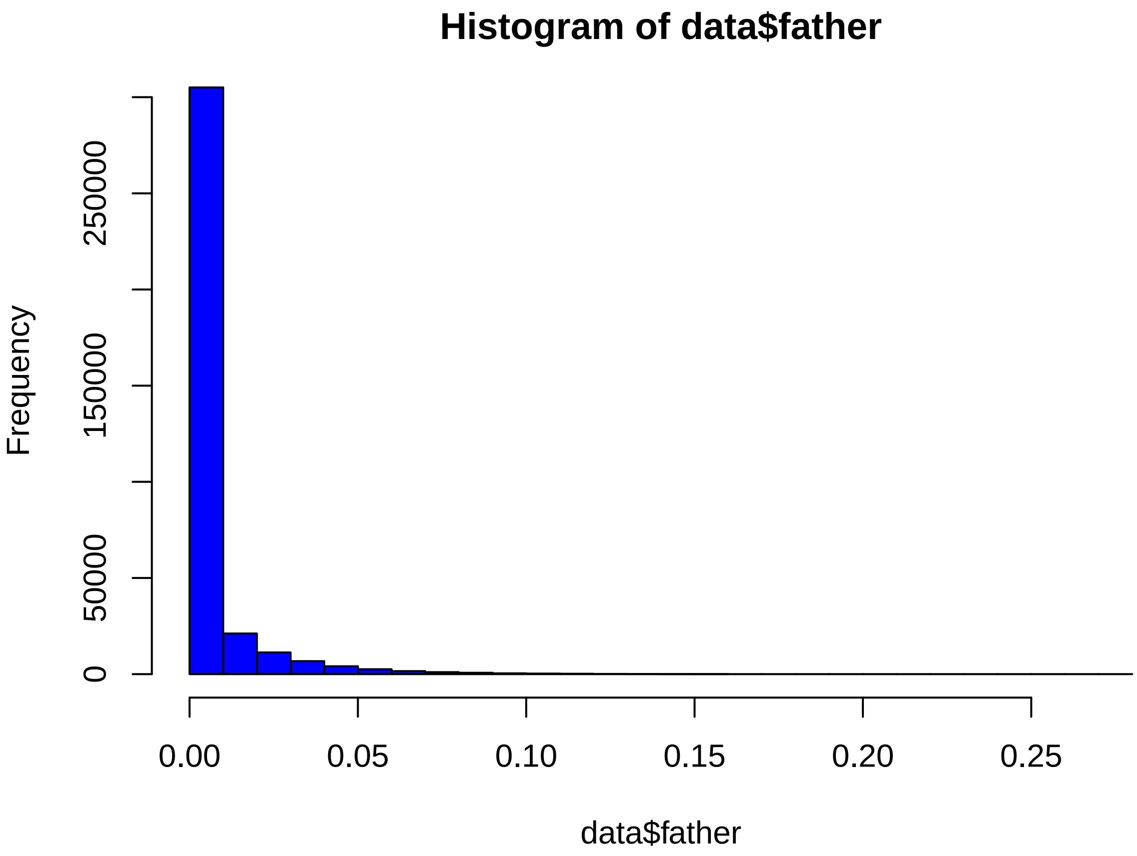
We can see that configurations of subjects are very different. Consequently, it makes the comparaisons of the videos quite complicated. It is not really relevant to compare the synchrony of two persons if the context is different (other people around them).

Raw Motion history by video by participant

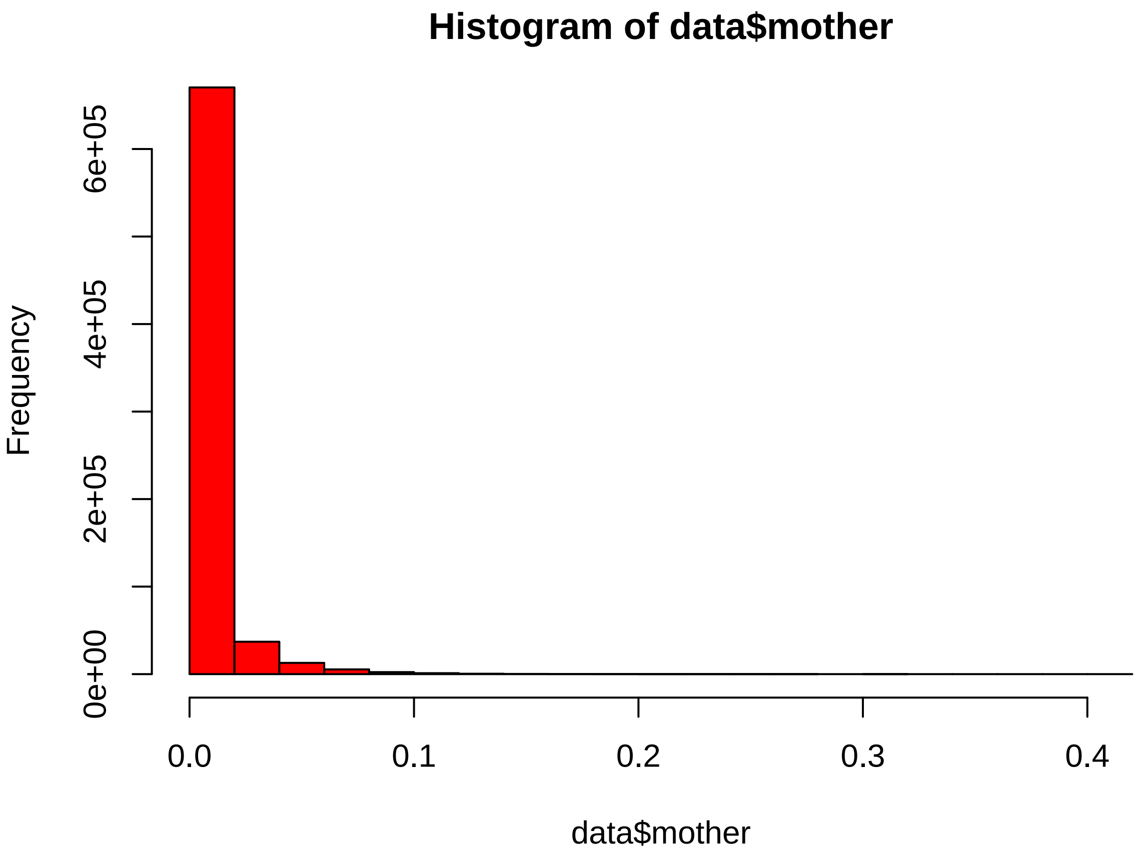
Boxplots

Histograms

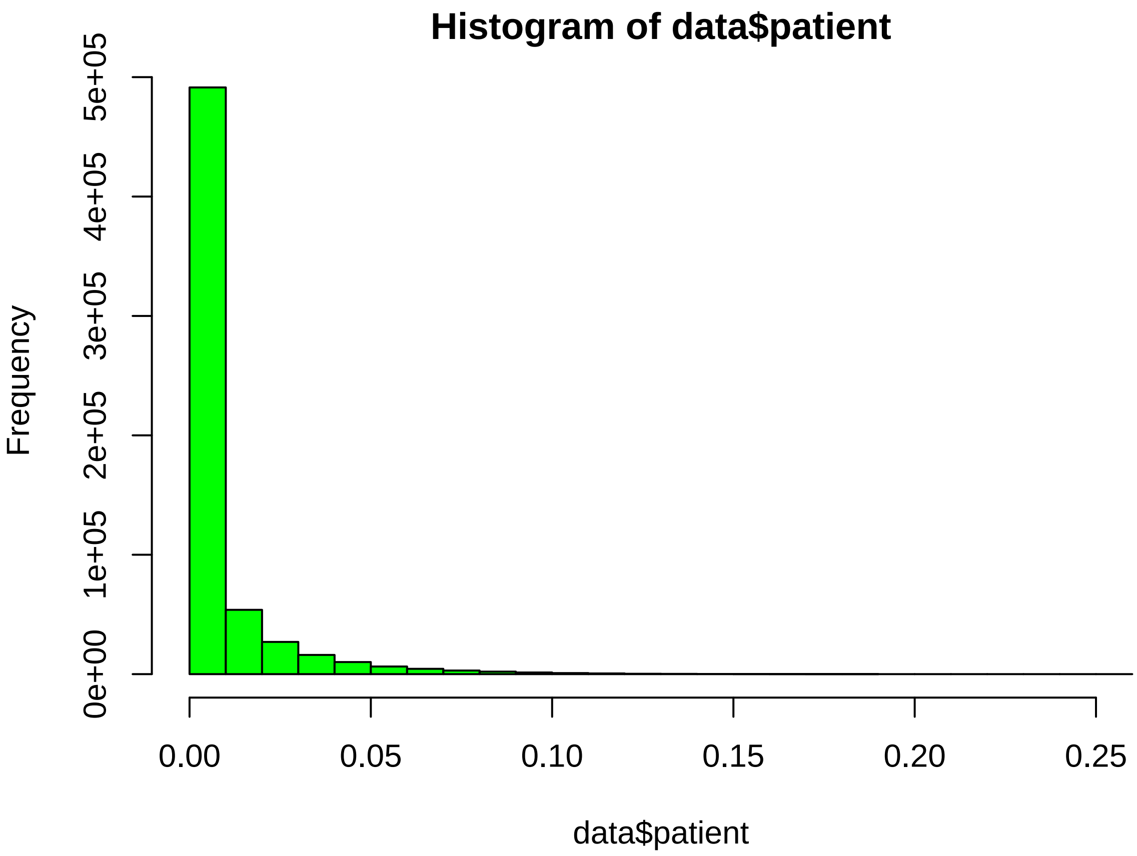
```
par(mar=c(4,4,2,2))
hist(data$father, col=colOrderList[1])
```



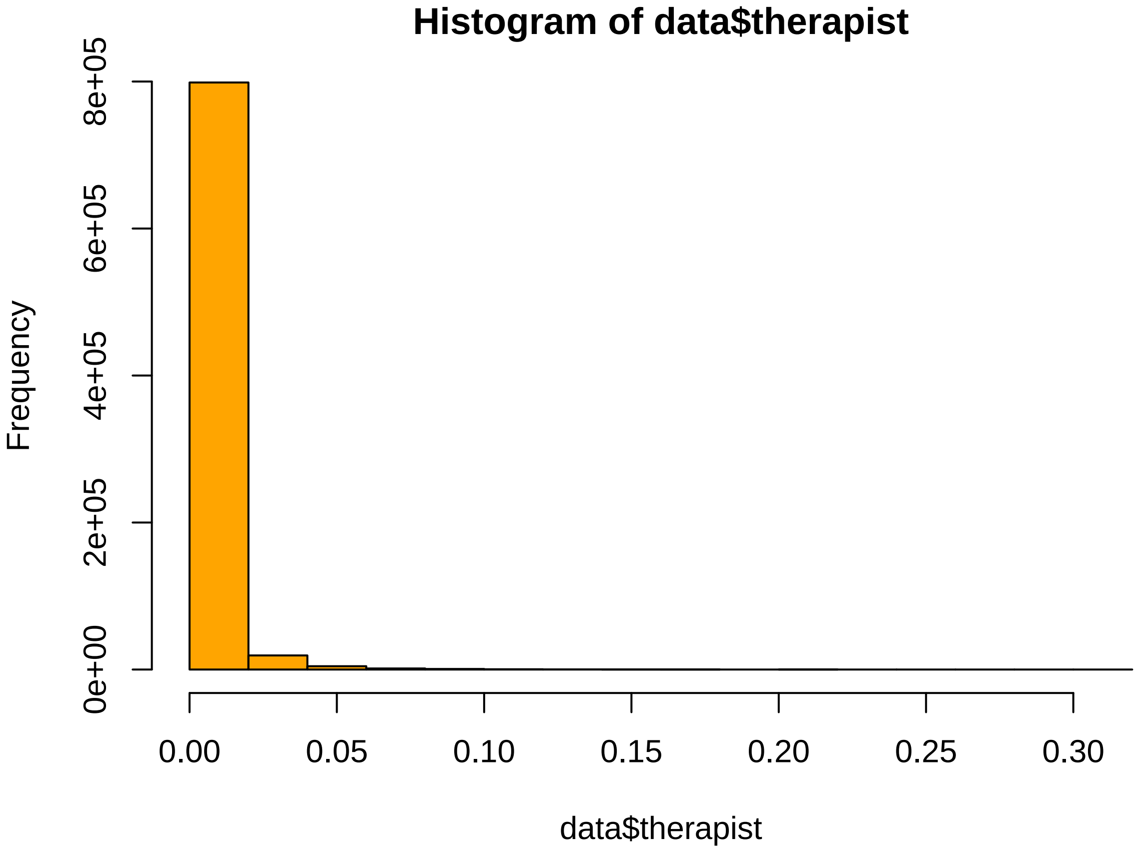
```
hist(data$mother, col=colOrderList[2])
```



```
hist(data$patient, col=colOrderList[3])
```



```
hist(data$therapist, col=colOrderList[4])
```

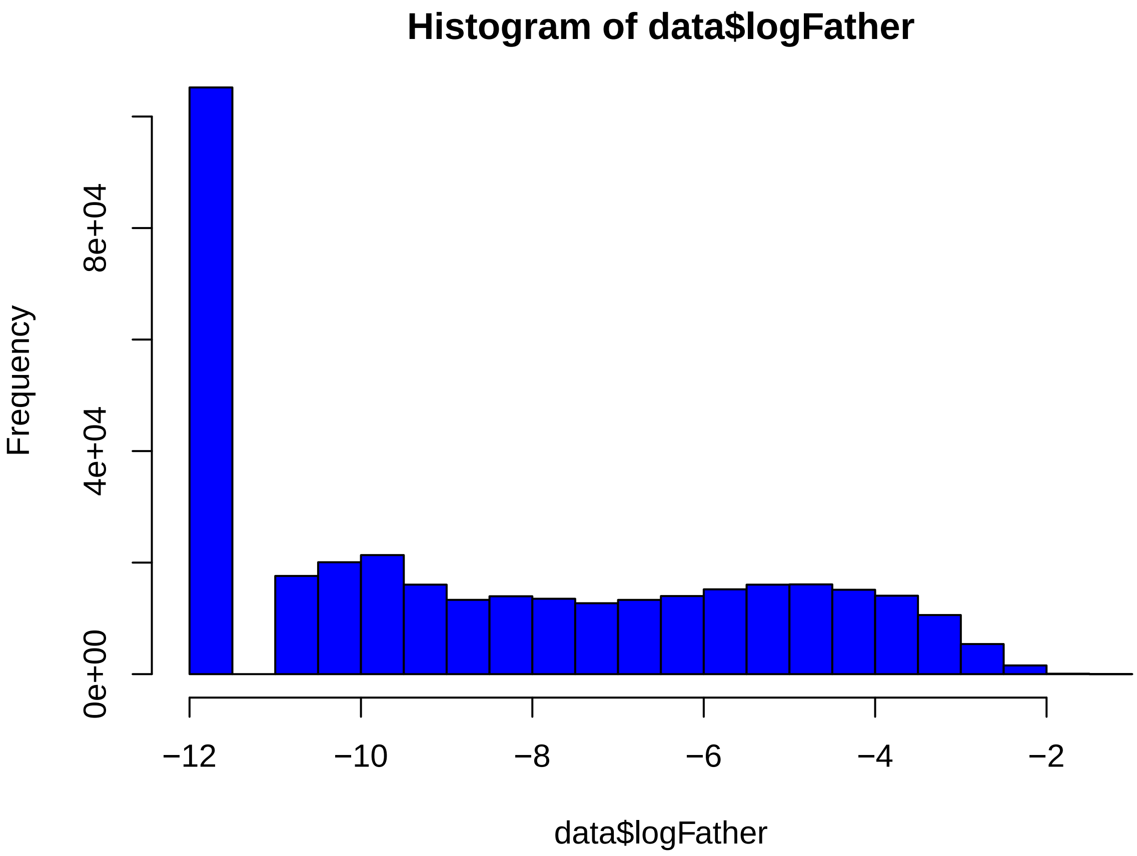


Normalized log Motion history by video by participant

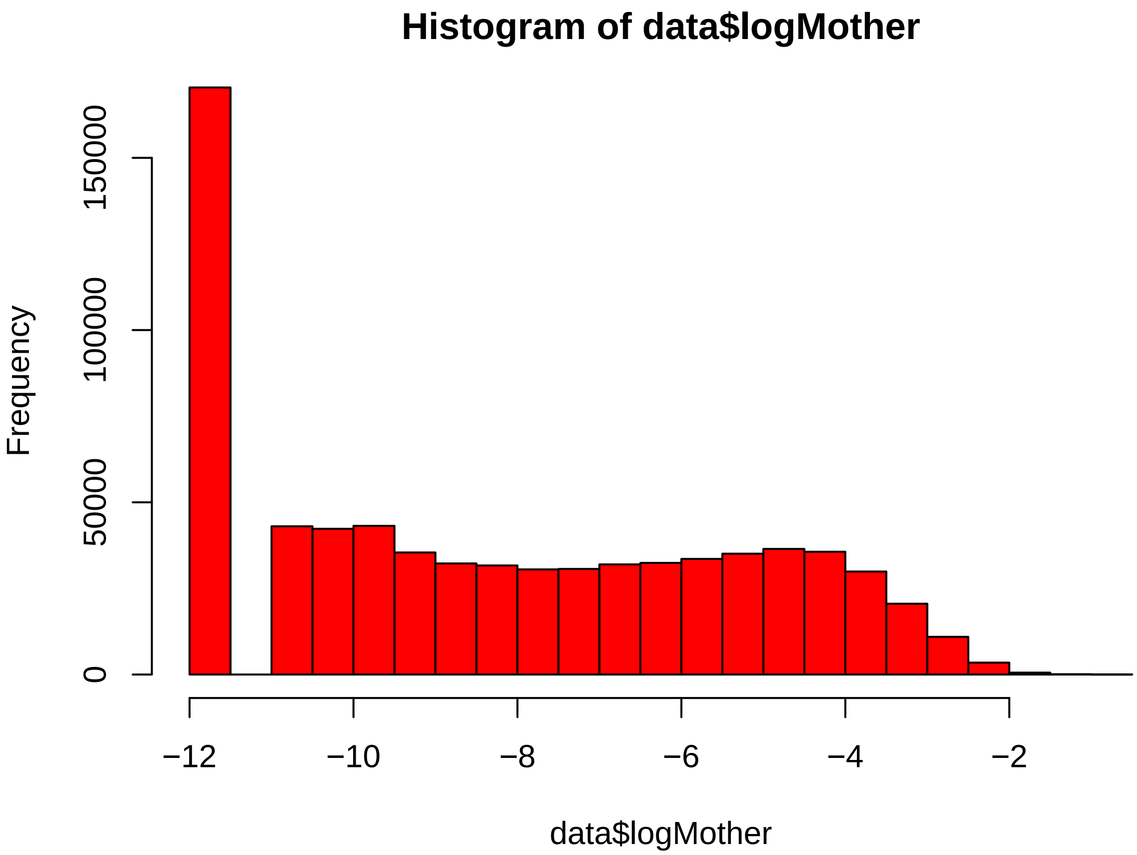
Boxplots

Histograms

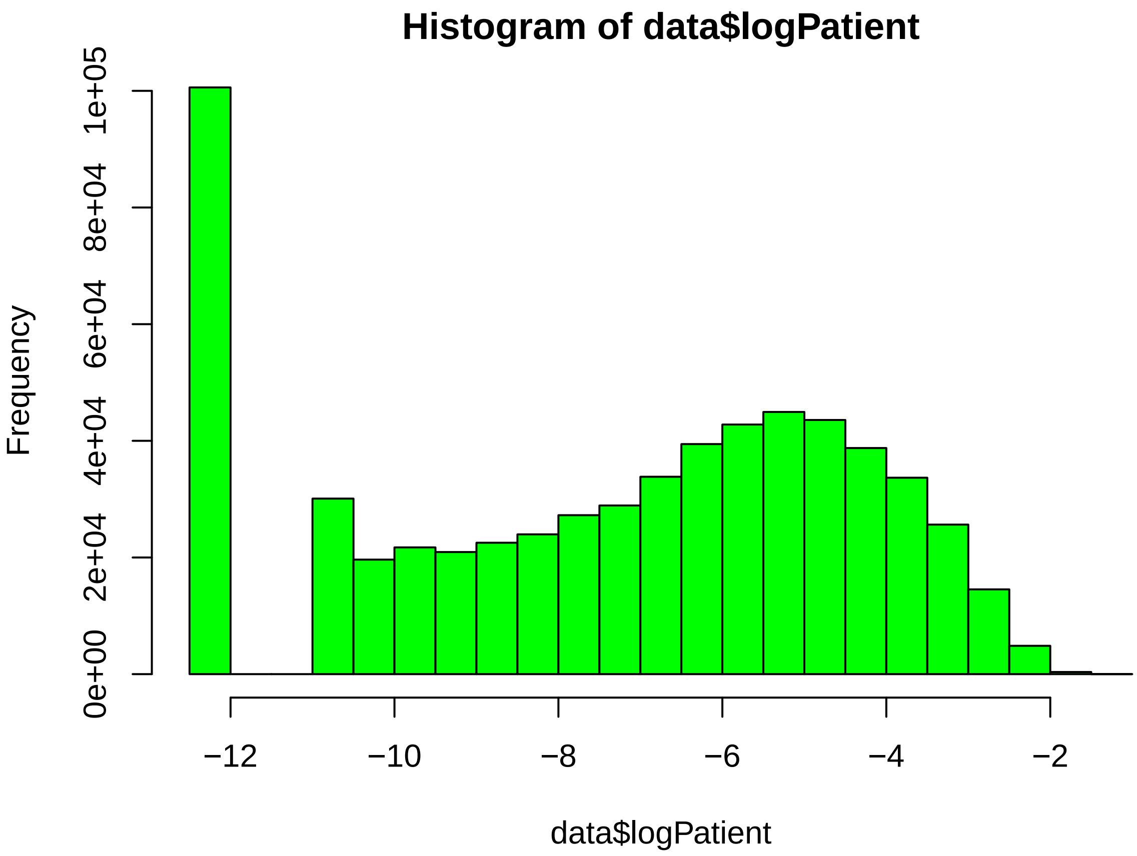
```
par(mar=c(4,4,2,2))
hist(data$logFather, col=colOrderList[1])
```



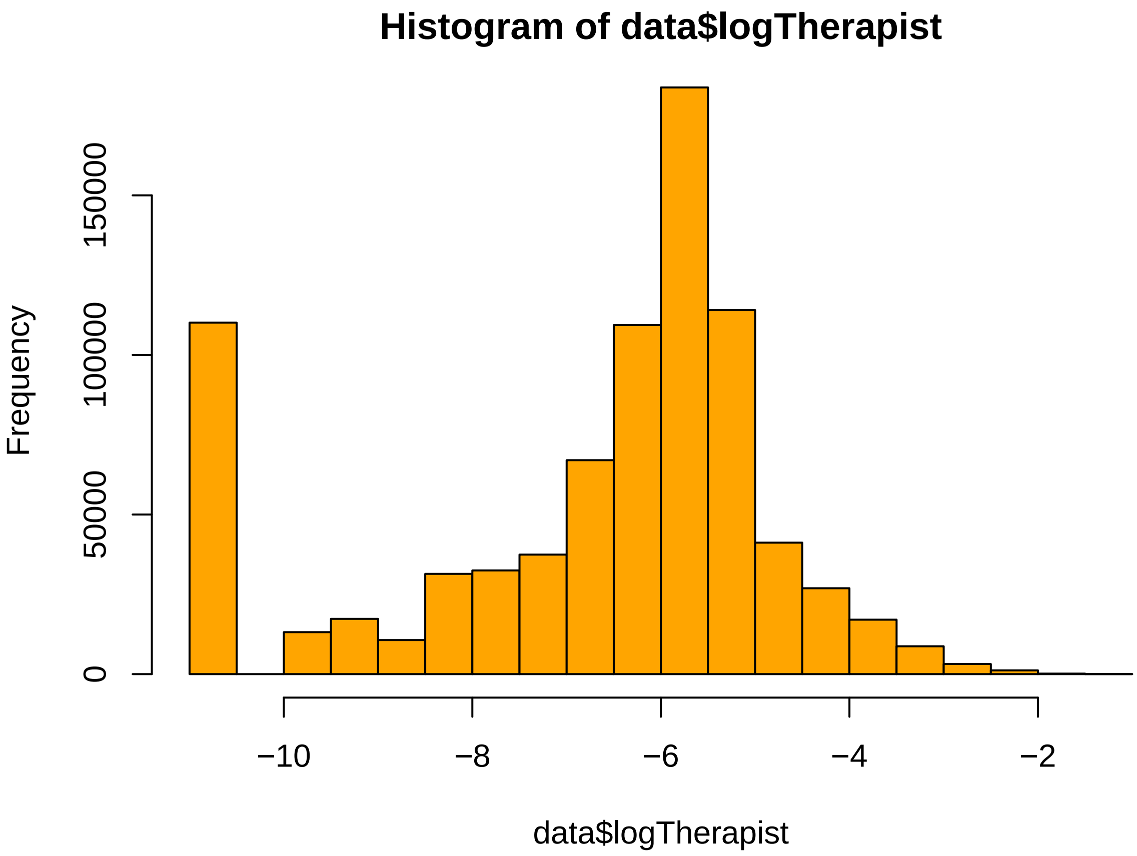
```
hist(data$logMother, col=colOrderList[2])
```



```
hist(data$logPatient, col=colOrderList[3])
```



```
hist(data$logTherapist, col=colOrderList[4])
```



We can see that the father and the mother motion history is very similar. However. The therapist, which is always in a small window of the video, as a very different distribution. We have less signal on it. In some videos the patient is in this window, it explains, it intermediates position.

Raw data and mean of Motion History on sliding and non overlapping intervals on 1st video F1044C1 video

It is the first video of F1044C. The father, mother and therapist are present. The patient is absent.

Raw data

```
rawFatherF1044C1 <- data[which(data$indexList=="F1044C1"),]$father
rawMotherF1044C1 <- data[which(data$indexList=="F1044C1"),]$mother
rawTherapistF1044C1 <- data[which(data$indexList=="F1044C1"),]$therapist

logFatherF1044C1 <- data[which(data$indexList=="F1044C1"),]$logFather
logMotherF1044C1 <- data[which(data$indexList=="F1044C1"),]$logMother
logTherapistF1044C1 <- data[which(data$indexList=="F1044C1"),]$logTherapist

summary(rawFatherF1044C1)
```

```
##      Min.   1st Qu.    Median      Mean   3rd Qu.      Max.
## 0.000e+00 2.079e-05 6.862e-04 7.710e-03 7.278e-03 1.568e-01
```

```
summary(rawMotherF1044C1)
```

```
##      Min.   1st Qu.    Median      Mean   3rd Qu.      Max. 
## 0.000e+00 4.563e-05 1.825e-04 4.059e-03 2.806e-03 1.116e-01
```

```
summary(rawTherapistF1044C1)
```

```
##     Min.  1st Qu.   Median     Mean  3rd Qu.     Max. 
## 0.001393 0.002832 0.003482 0.004640 0.004411 0.083240
```

```
summary(logFatherF1044C1)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max. 
## -11.830 -10.480  -7.274  -7.645  -4.922  -1.853
```

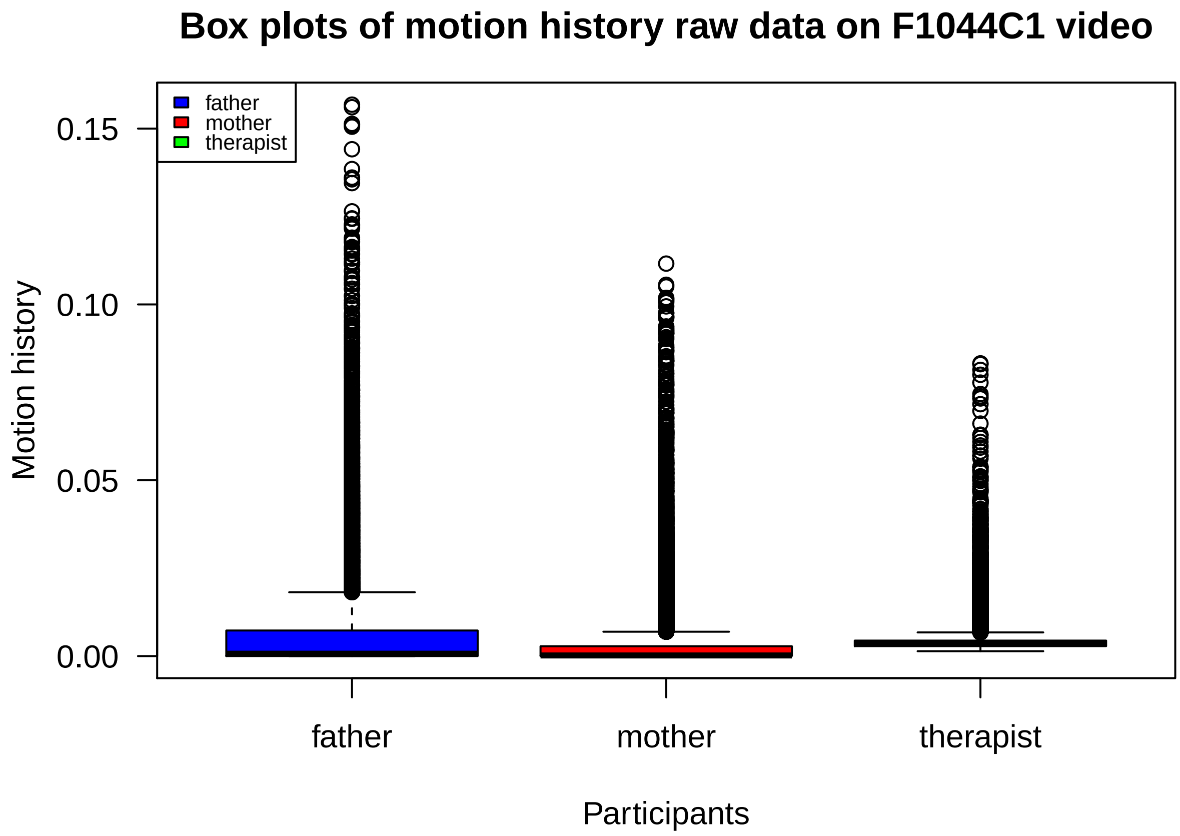
```
summary(logMotherF1044C1)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max. 
## -11.990  -9.868  -8.575  -8.028  -5.874  -2.193
```

```
summary(logTherapistF1044C1)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max. 
##  -6.561  -5.859  -5.654  -5.556  -5.419  -2.486
```

```
par(mar=c(4,4,3,2))
boxplot(rawFatherF1044C1, rawMotherF1044C1, rawTherapistF1044C1,
        col=colOrderList[c(1,2,4)],
        names=ParticipantsList[c(1,2,4)],
        main= "Box plots of motion history raw data on F1044C1 video", las=1, ylab ="Motion history", xl
par(mar=c(1,0.5,0.5,1))
legend("topleft", ParticipantsList[c(1,2,4)], fill=colOrderList, cex=0.7)
```



Sliding interval

```
## REMINDER:
# SlidingInterval <- function(subject, indexOfvideos=1:NumberOfvideos, interval, data) with :
# subject : subject studied (patient, mother, father or therapist)
# indexOfvideos : list of videos studied (element eg. 3 or list eg 1:3 or c(1,2,4))
# interval : number of frames in the studied interval
# data : data frame where there is data

slidedFatherF1044C1 <- SlidingInterval("father", 1 , 5, data)
slidedMotherF1044C1 <- SlidingInterval("mother", 1 , 5, data)
slidedPatientF1044C1 <- SlidingInterval("patient", 1 , 5, data)
slidedTherapistF1044C1 <- SlidingInterval("therapist", 1 , 5, data)

slidedLogFatherF1044C1 <- SlidingInterval("logFather", 1 , 5, data)
slidedLogMotherF1044C1 <- SlidingInterval("logMother", 1 , 5, data)
slidedLogPatientF1044C1 <- SlidingInterval("logPatient", 1 , 5, data)
slidedLogTherapistF1044C1 <- SlidingInterval("logTherapist", 1 , 5, data)

summary(slidedFatherF1044C1)
```

```
##      Min.   1st Qu.    Median      Mean   3rd Qu.      Max.
## 0.000e+00 4.271e-05 2.234e-04 5.362e-03 2.747e-03 2.493e-01
```

```
summary(slidedMotherF1044C1)
```

```
##      Min.   1st Qu.    Median      Mean   3rd Qu.      Max.
## 0.0000000 0.0007124 0.0058320 0.0131100 0.0178900 0.2008000
```

```
summary(slidedPatientF1044C1)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's 
##      NA      NA      NA     NaN      NA      NA   43132
```

```
summary(slidedTherapistF1044C1)
```

```
##      Min.   1st Qu.    Median      Mean   3rd Qu.      Max. 
## 0.000e+00 1.698e-05 1.188e-04 2.225e-03 8.318e-04 1.594e-01
```

```
summary(slidedLogFatherF1044C1)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max. 
## -11.830 -10.120  -8.711  -8.050  -6.014  -1.393
```

```
summary(slidedLogMotherF1044C1)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max. 
## -11.990  -7.701  -5.342  -6.075  -4.087  -1.648
```

```
summary(slidedLogPatientF1044C1)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's 
##      NA      NA      NA     NaN      NA      NA   43132
```

```
summary(slidedLogTherapistF1044C1)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max. 
## -10.760 -10.440  -9.480  -8.750  -7.570  -1.837
```

Non overlapping interval

```
fatherFiveF1044C1<- MeanMotionByTime("father", indexOfvideos=1, interval=5, data)

motherFiveF1044C1 <- MeanMotionByTime("mother", indexOfvideos=1, interval=5, data)

therapistFiveF1044C1 <- MeanMotionByTime("therapist", indexOfvideos=1, interval=5, data)

fatherLogFiveF1044C1<- MeanMotionByTime("logFather", indexOfvideos=1, interval=5, data)

motherLogFiveF1044C1 <- MeanMotionByTime("logMother", indexOfvideos=1, interval=5, data)

therapistLogFiveF1044C1 <- MeanMotionByTime("logTherapist", indexOfvideos=1, interval=5, data)

summary(fatherFiveF1044C1)
```

```
##      Min.   1st Qu.    Median      Mean   3rd Qu.      Max. 
## 0.000e+00 4.271e-05 2.218e-04 5.361e-03 2.722e-03 2.248e-01
```

```
summary(motherFiveF1044C1)
```

```
##      Min.   1st Qu.    Median      Mean   3rd Qu.      Max. 
## 0.0000000 0.0006942 0.0058640 0.0131200 0.0178900 0.1875000
```

```
summary(therapistFiveF1044C1)
```

```
##      Min.   1st Qu.    Median      Mean   3rd Qu.      Max. 
## 0.000e+00 8.490e-06 1.273e-04 2.224e-03 8.403e-04 1.475e-01
```

```
summary(fatherLogFiveF1044C1)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## -11.830 -10.120  -8.715  -8.050  -6.022  -1.510
```

```
summary(motherLogFiveF1044C1)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## -11.990  -7.698  -5.330  -6.075  -4.087  -1.674
```

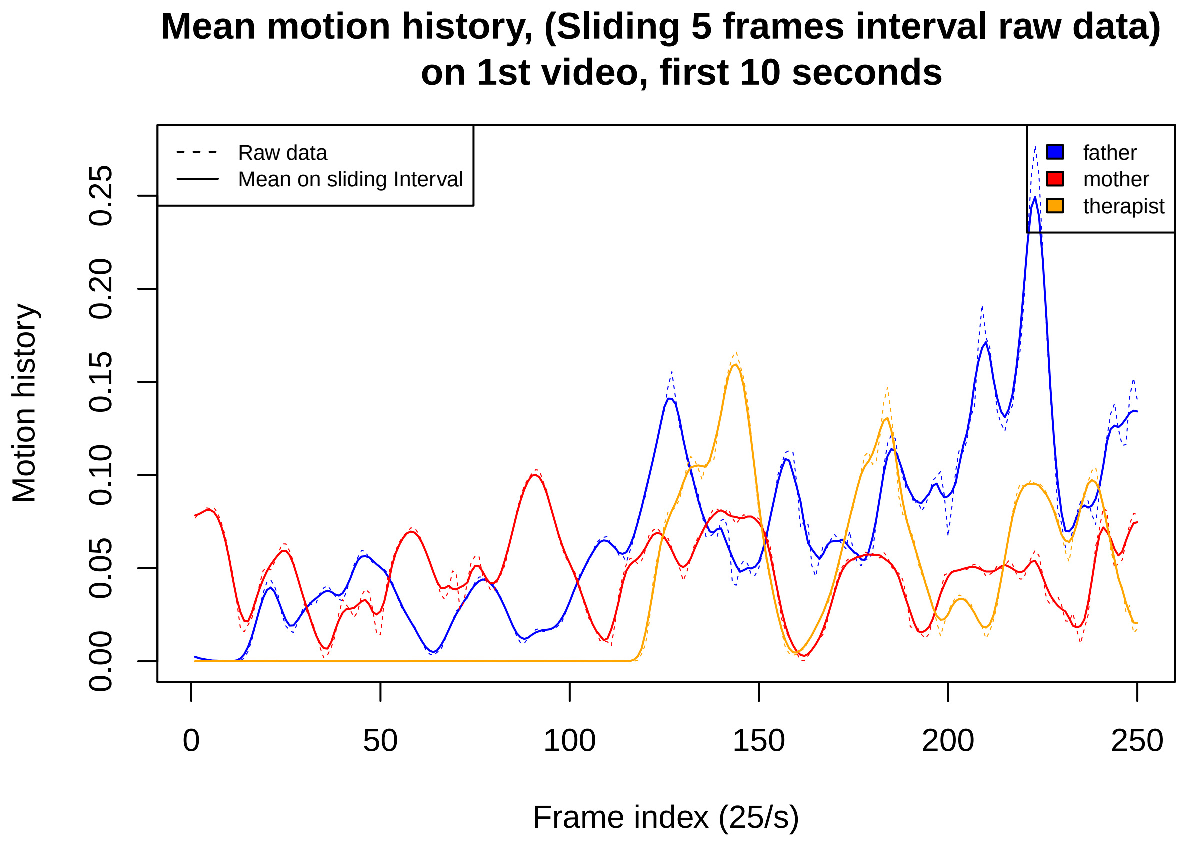
```
summary(therapistLogFiveF1044C1)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## -10.760 -10.540  -9.473  -8.750  -7.543  -1.920
```

Focus on the motion history of the first 10 seconds of the first video

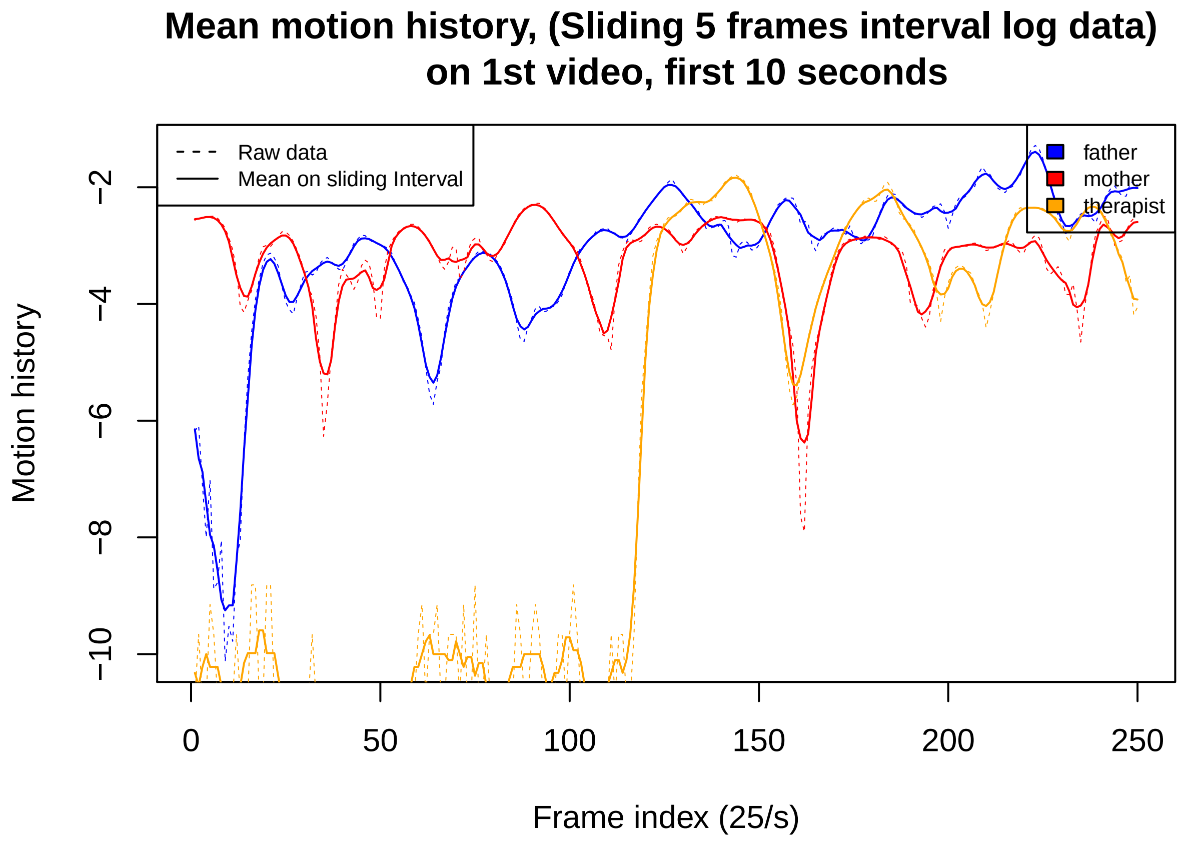
Sliding interval function on a raw data, 5 frames interval

```
par(mar=c(4,4,4,2))
plot(1:250, data$father[3:252], main="Mean motion history, (Sliding 5 frames interval raw data)
    on 1st video, first 10 seconds ", xlab="Frame index (25/s)",
     ylab="Motion history",
     col="blue", type="l", lty=2, lwd=0.5)
lines(slidedFatherF1044C1[1:250],  col="blue", lty=1)
lines(data$mother[3:252],  col="red", lty=2, lwd=0.5)
lines(slidedMotherF1044C1[1:250],  col="red", lty=1)
lines(data$therapist[3:252],  col="orange", lty=2, lwd=0.5)
lines(slidedTherapistF1044C1[1:250],  col="orange", lty=1)
legend("topleft", c("Raw data", "Mean on sliding Interval") , lty=c(2, 1), cex=0.7)
legend("topright", ParticipantsList[c(1,2,4)], fill=colOrderList[c(1,2,4)], cex=0.7)
```



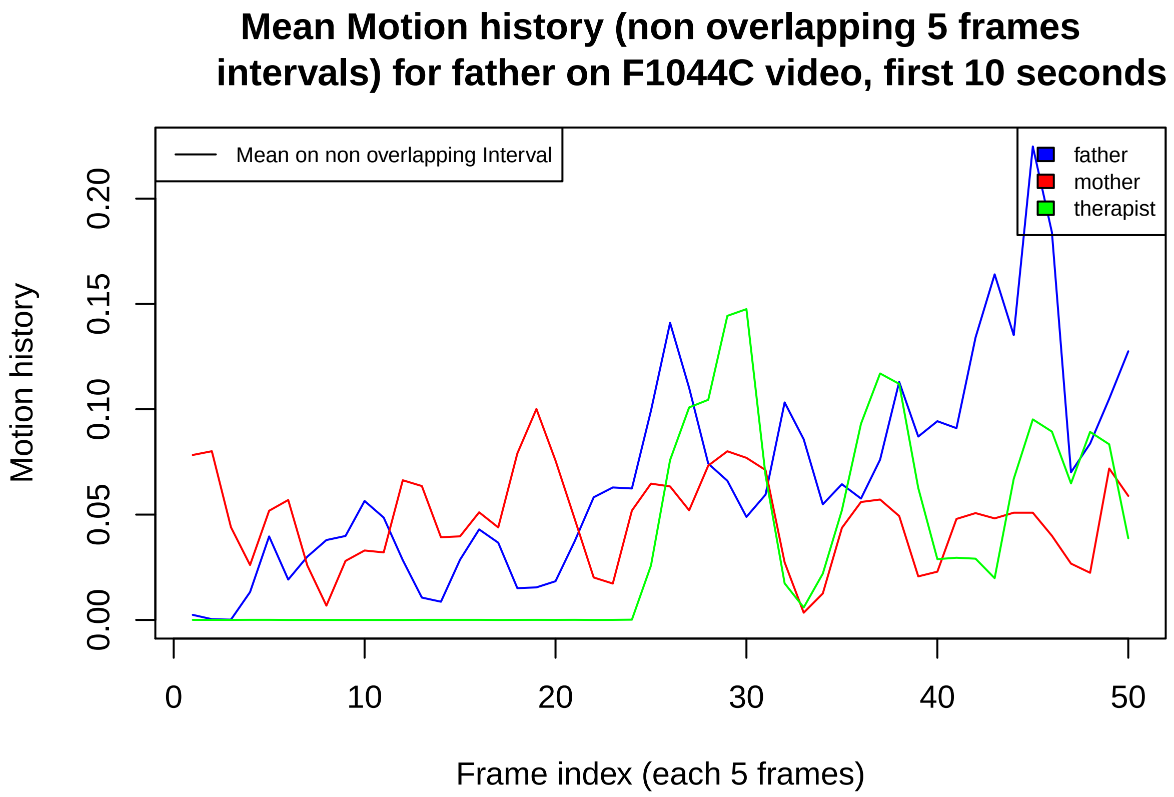
Sliding interval function on log data, 5 frames interval

```
par(mar=c(4,4,4,2))
plot(1:250, data$logFather[3:252], main="Mean motion history, (Sliding 5 frames interval log data)
    on 1st video, first 10 seconds", xlab="Frame index (25/s)",
     ylab="Motion history",
     col="blue", type="l", lty=2, lwd=0.5)
lines(slidedLogFatherF1044C1[1:250],  col="blue", lty=1)
lines(data$logMother[3:252],  col="red", lty=2, lwd=0.5)
lines(slidedLogMotherF1044C1[1:250],  col="red", lty=1)
lines(data$logTherapist[3:252],  col="orange", lty=2, lwd=0.5)
lines(slidedLogTherapistF1044C1[1:250],  col="orange", lty=1)
legend("topleft", c("Raw data", "Mean on sliding Interval") , lty=c(2, 1), cex=0.7)
legend("topright", ParticipantsList[c(1,2,4)], fill=colOrderList[c(1,2,4)], cex=0.7)
```



Non overlapping interval function on a 5 frames interval

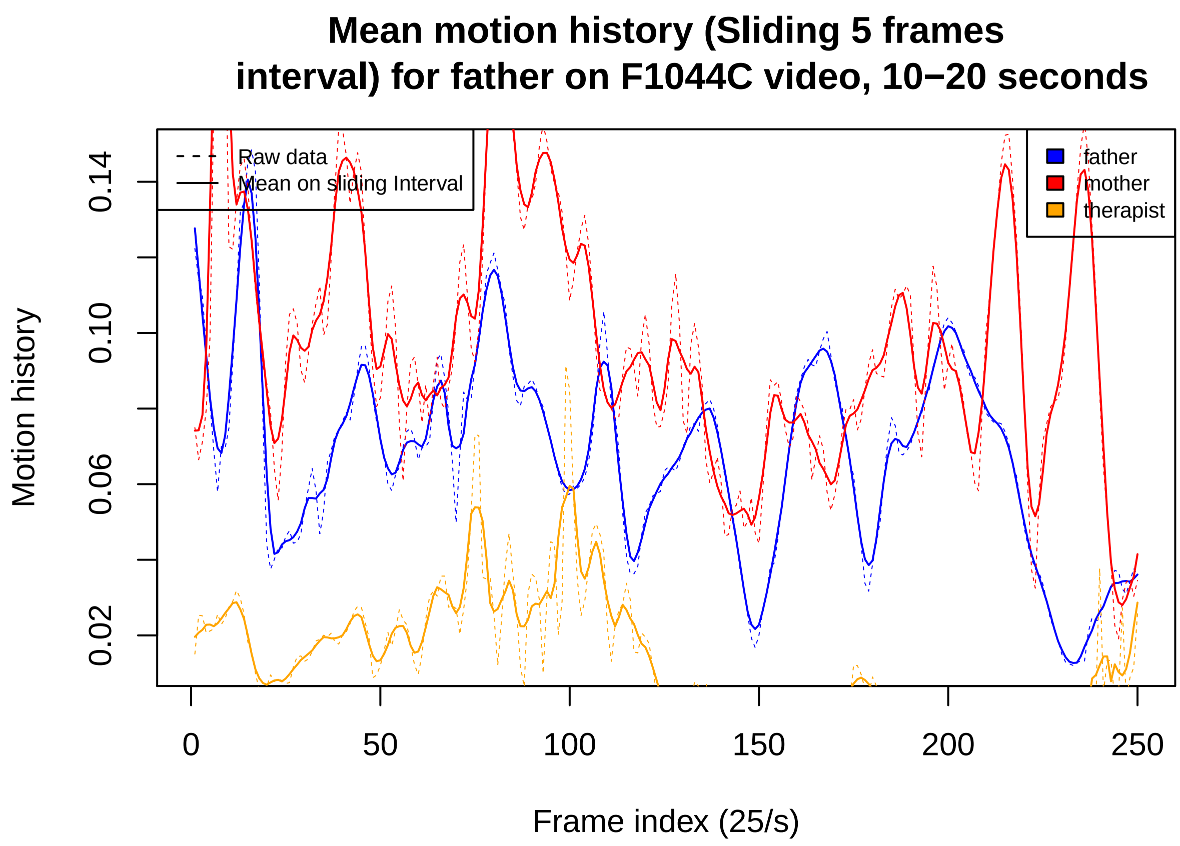
```
plot (1:50, fatherFiveF1044C1[1:50], type="l", col="blue",
main="Mean Motion history (non overlapping 5 frames
      intervals) for father on F1044C video, first 10 seconds",
ylab="Motion history", xlab="Frame index (each 5 frames)" )
lines(motherFiveF1044C1[1:50], col="red", lty=1)
lines(therapistFiveF1044C1[1:50], col="green", lty=1)
legend("topleft", "Mean on non overlapping Interval" , lty=1, cex=0.7)
legend("topright", ParticipantsList[c(1,2,4)], fill=colOrderList, cex=0.7)
```



Motion history of the father during 10-20 seconds of the first video(C)

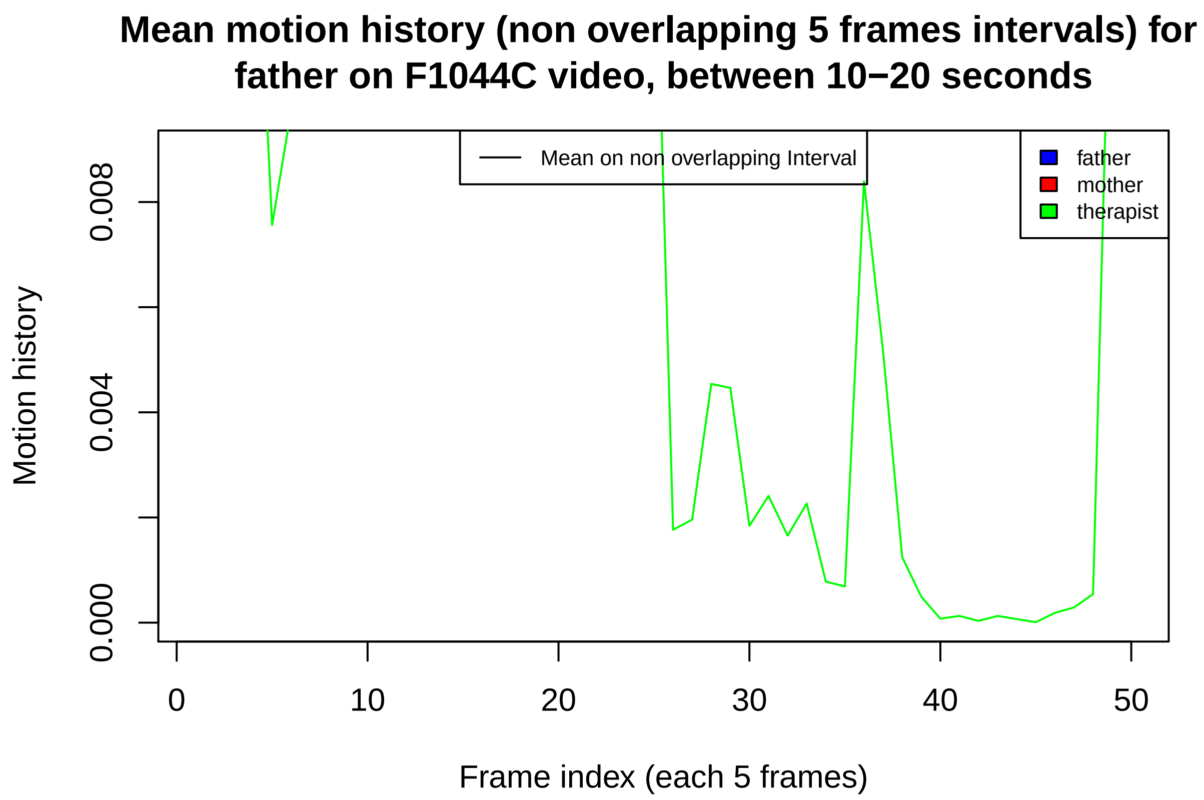
Non overlapping interval function on a 5 frames interval

```
par(mar=c(4,4,4,2))
plot(1:250, data$father[253:502], main="Mean motion history (Sliding 5 frames
     interval) for father on F1044C video, 10-20 seconds", xlab="Frame index (25/s)",
     ylab="Motion history", col="blue", type="l", lty=2, lwd=0.5)
lines(slidedFatherF1044C1[251:500],  col="blue", lty=1)
lines(data$mother[253:502],  col="red", lty=2, lwd=0.5)
lines(slidedMotherF1044C1[251:500],  col="red", lty=1)
lines(data$therapist[253:502],  col="orange", lty=2, lwd=0.5)
lines(slidedTherapistF1044C1[251:500],  col="orange", lty=1)
legend("topleft", c("Raw data", "Mean on sliding Interval") , lty=c(2, 1), cex=0.7)
legend("topright", ParticipantsList[c(1,2,4)], fill=colOrderList[c(1,2,4)], cex=0.7)
```



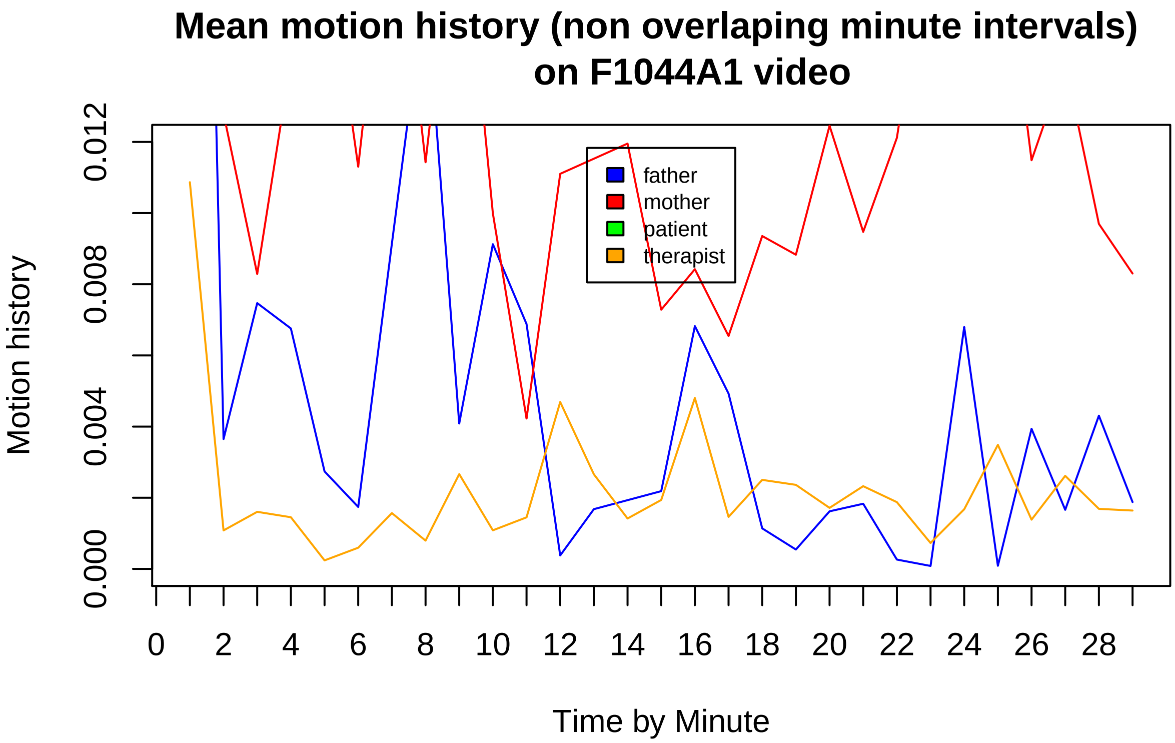
Non overlapping interval function on a 5 frames interval

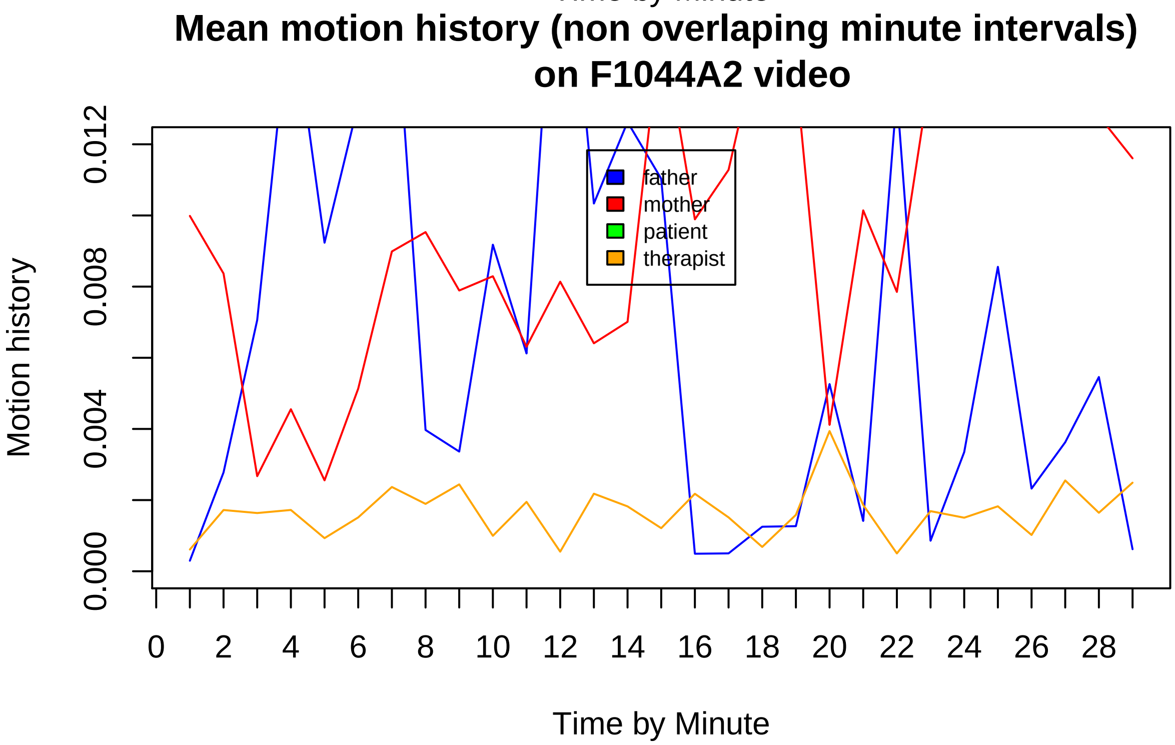
```
plot (1:50, fatherFiveF1044C1[51:100], type="l", col="blue",
main="Mean motion history (non overlapping 5 frames intervals) for
father on F1044C video, between 10-20 seconds",
ylab="Motion history", xlab="Frame index (each 5 frames)", ylim=c(0, 0.009))
lines(motherFiveF1044C1[51:100], col="red", lty=1)
lines(therapistFiveF1044C1[51:100], col="green", lty=1)
legend("top", "Mean on non overlapping Interval" , lty=1, cex=0.7)
legend("topright", ParticipantsList[c(1,2,4)], fill=colOrderList, cex=0.7)
```

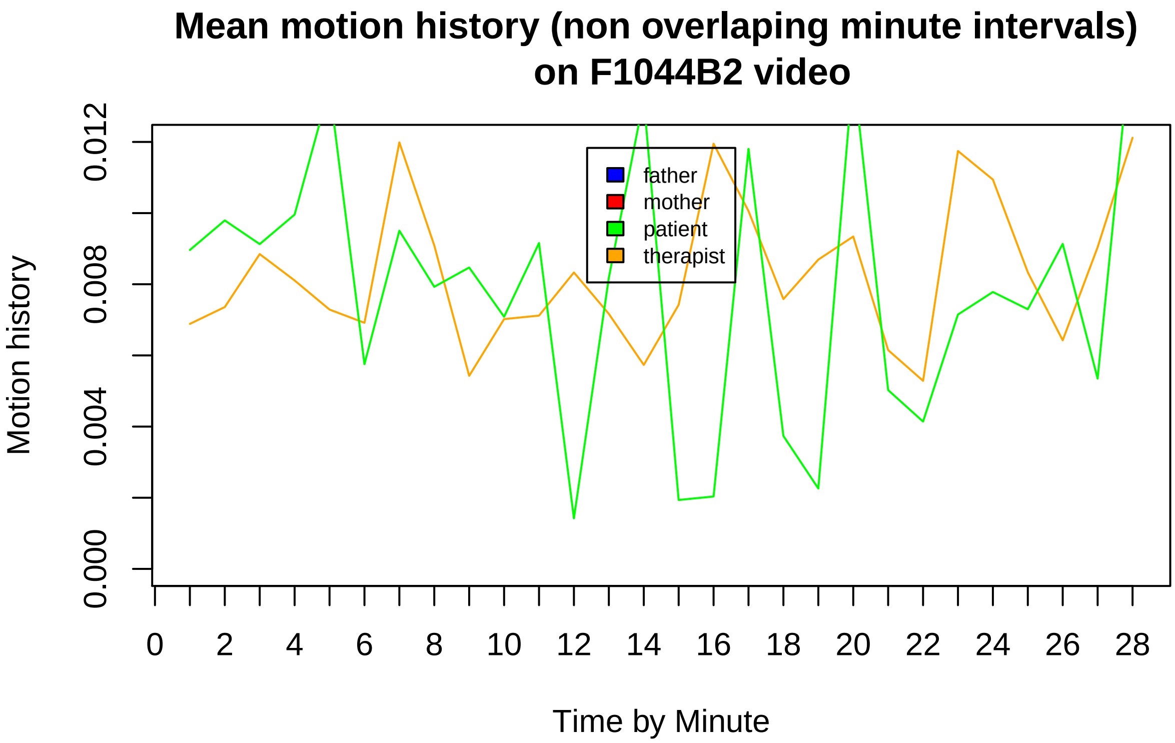


Mean motion history by minute plots

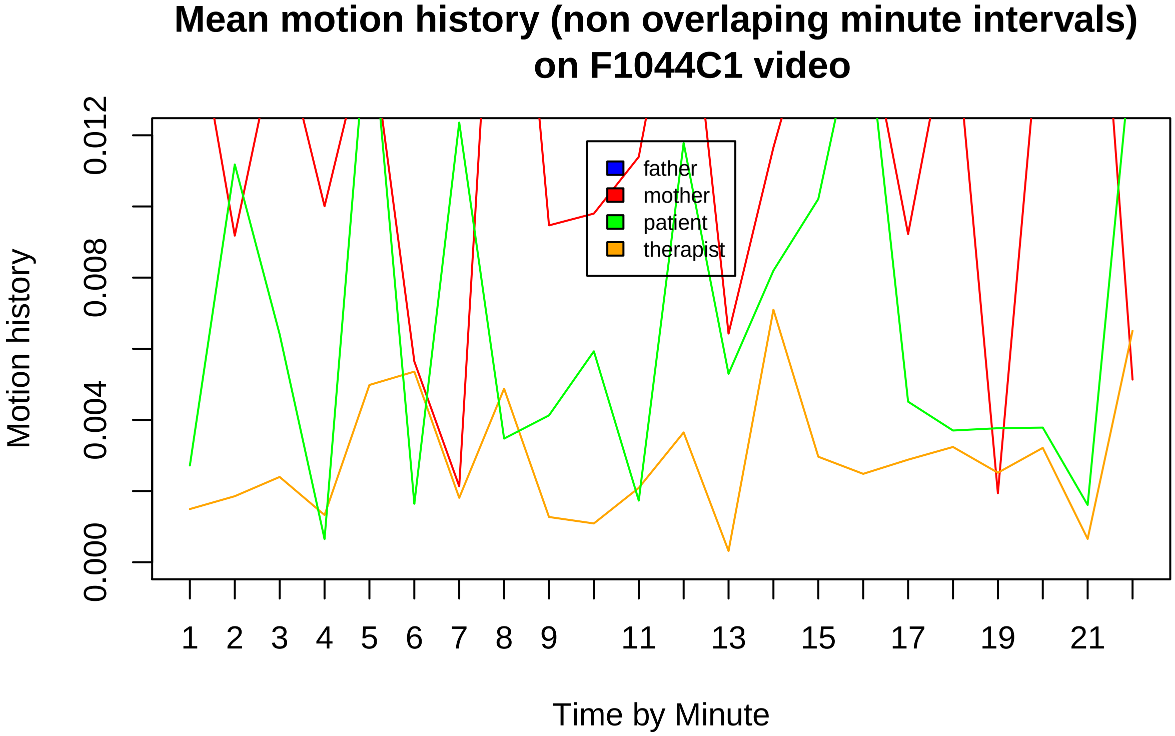
```
for (i in 1:NumberOfvideos){
  fatherMinute<- MeanMotionByTime("father", indexOfvideos=i, interval=1500, data)

  MotherMinute<- MeanMotionByTime("mother", indexOfvideos=i, interval=1500, data)

  TherapistMinute<- MeanMotionByTime("therapist", indexOfvideos=i, interval=1500, data)

  PatientMinute<- MeanMotionByTime("patient", indexOfvideos=i, interval=1500, data)

  par(mar=c(4,4,4,2))
      plot (1:length(fatherMinute), fatherMinute, type="l", col="blue",
      main=paste("Mean motion history (non overlaping minute intervals)
      on F1044", labelvideolist[i], " video" , sep=""),
      ylab="Motion history", xlab="Time by Minute", ylim=c(0, 12E-03),
      xaxp=c(0, length(fatherMinute), length(fatherMinute)))
      lines(MotherMinute, col="red")
      lines(TherapistMinute, col="orange")
      lines(PatientMinute, col="green")
      legend("top", inset=.05, ParticipantsList,
             fill=colOrderList, cex=0.7)}
```


Mean motion history (non overlaping minute intervals)
on F1044A1 video
Motion history
0.000
0.004
0.008
0.012
Time by Minute
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
🟦 father
🟥 mother
🟩 patient
🟧 therapist

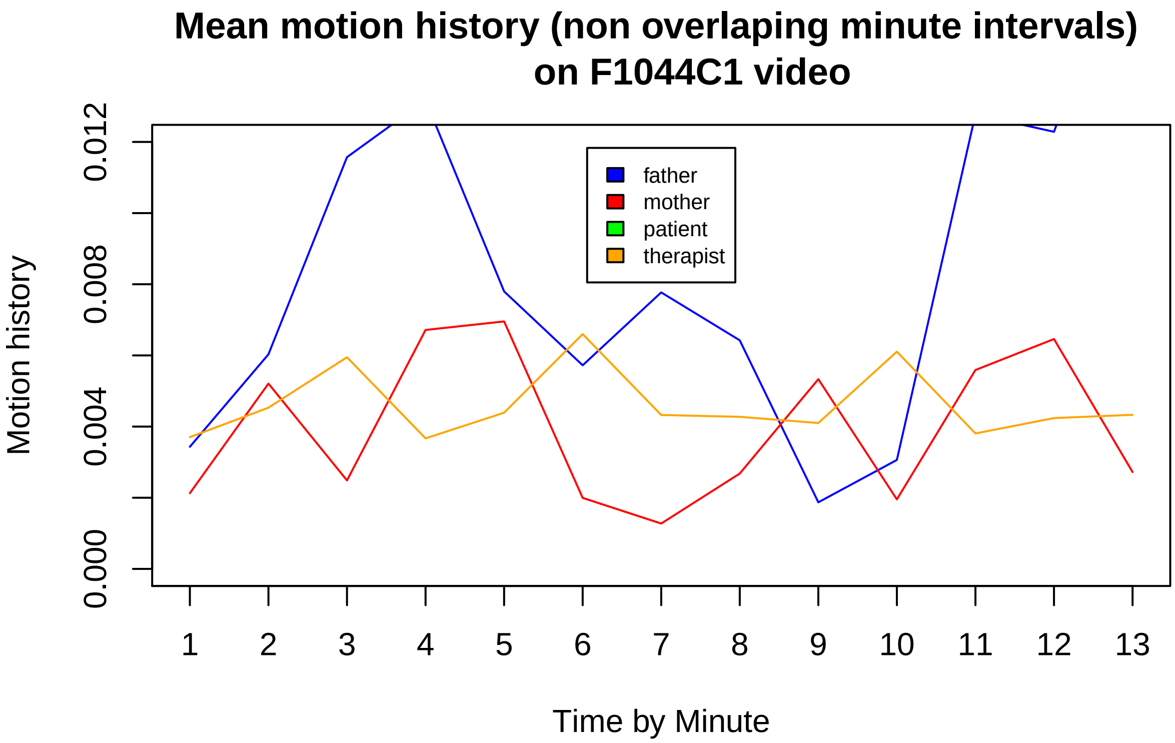

Mean motion history (non overlaping minute intervals)
on F1044A2 video
Motion history
0.000
0.004
0.008
0.012
Time by Minute
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
🟦 father
🟥 mother
🟩 patient
🟧 therapist

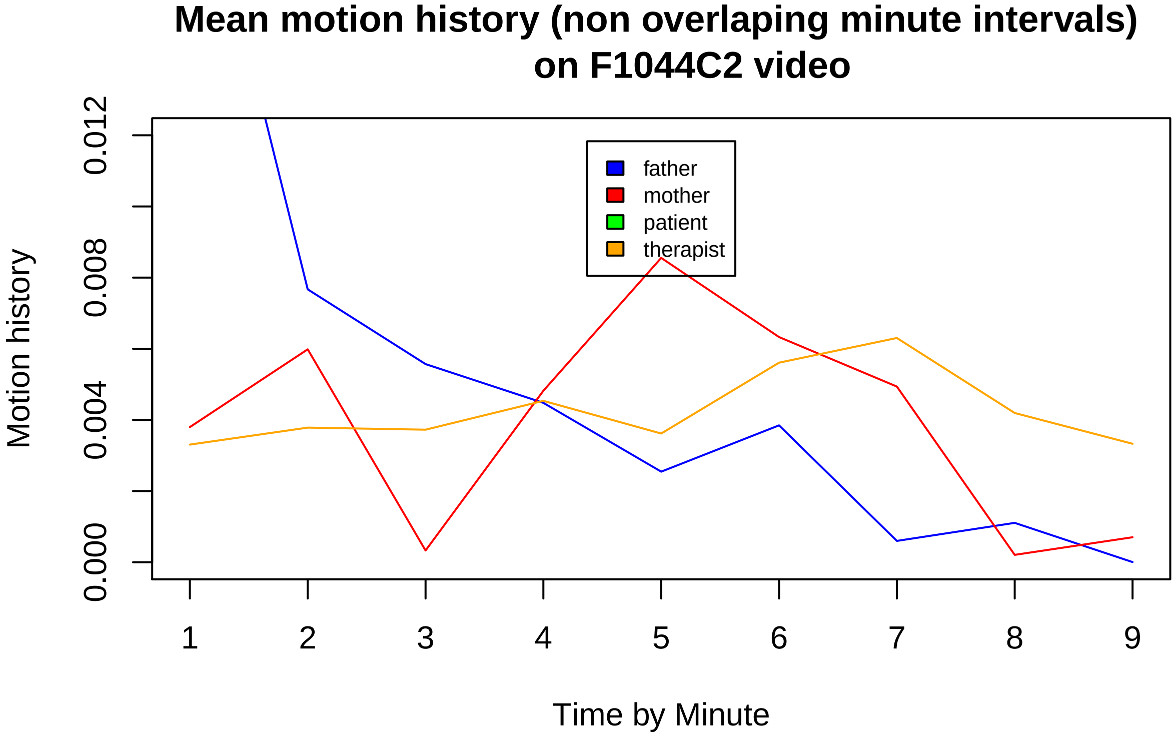


Mean motion history (non overlaping minute intervals)
on F1044B2 video
father
mother
patient
therapist
Motion history
0.000
0.004
0.008
0.012
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
Time by Minute

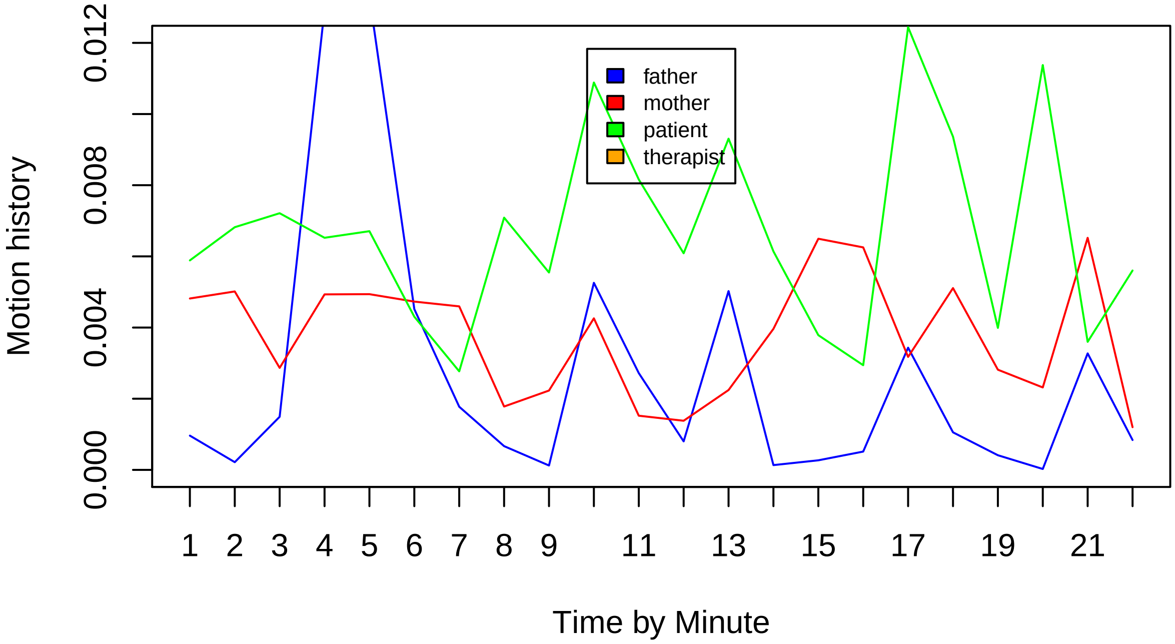


Mean motion history (non overlaping minute intervals)
on F1044C1 video
father
mother
patient
therapist
Motion history
0.000
0.004
0.008
0.012
1
2
3
4
5
6
7
8
9
11
13
15
17
19
21
Time by Minute

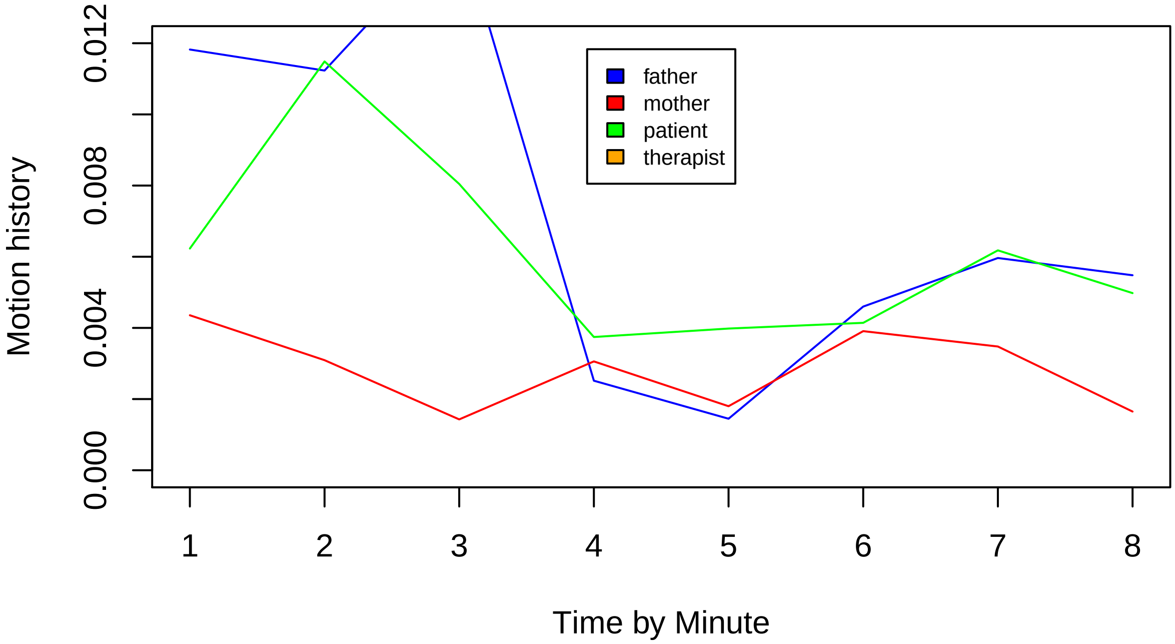

Mean motion history (non overlaping minute intervals)
on F1044C1 video
Motion history
0.000
0.004
0.008
0.012
Time by Minute
1
2
3
4
5
6
7
8
9
10
11
12
13
father
mother
patient
therapist

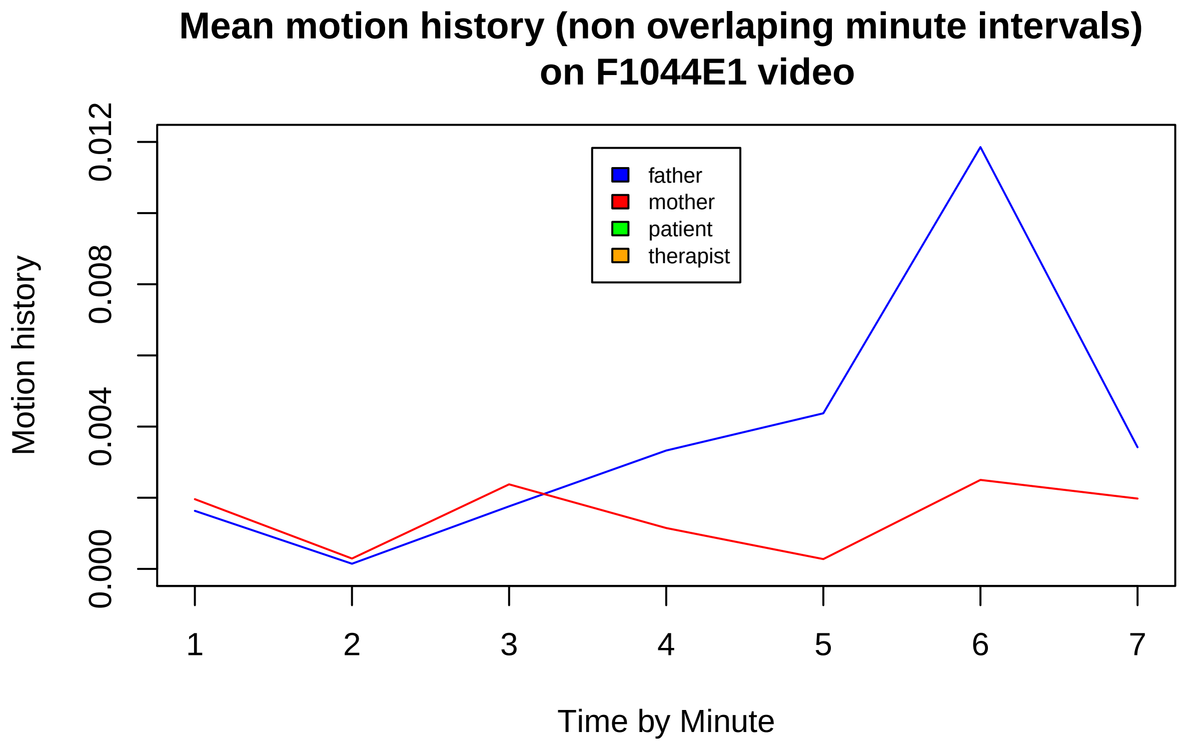

Mean motion history (non overlaping minute intervals)
on F1044C2 video
Motion history
0.000
0.004
0.008
0.012
Time by Minute
1
2
3
4
5
6
7
8
9
father
mother
patient
therapist

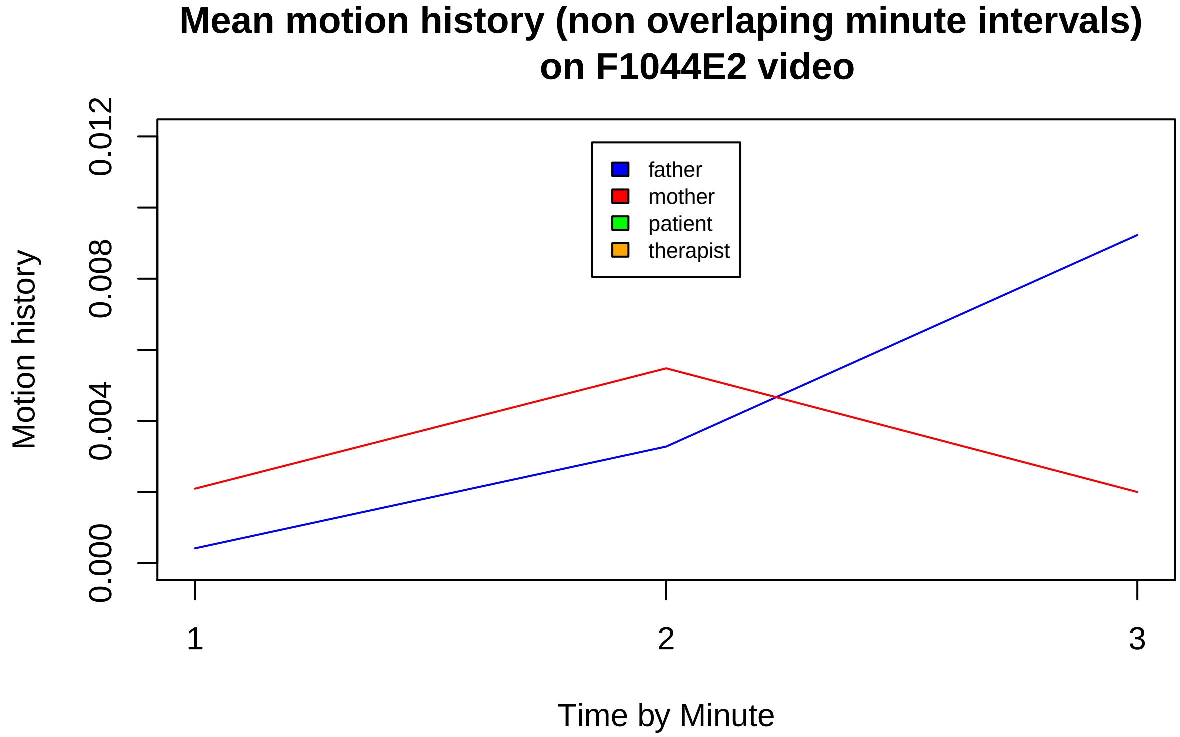
Mean motion history (non overlaping minute intervals) on F1044D1 video

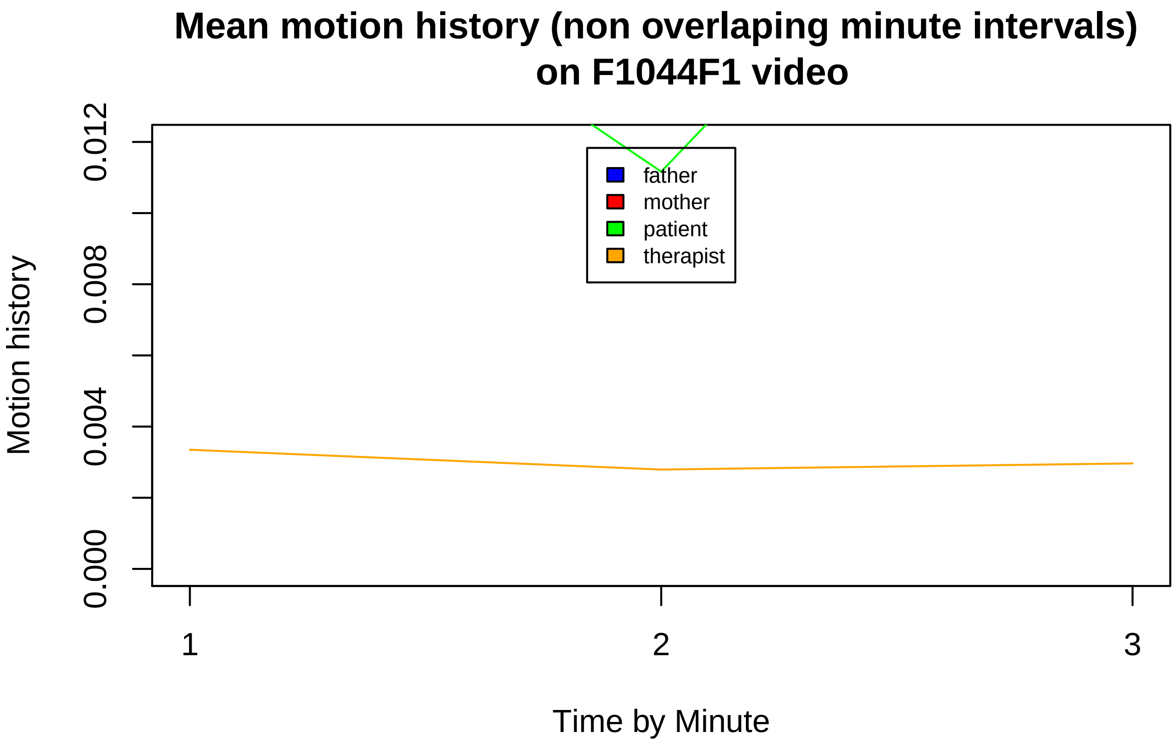


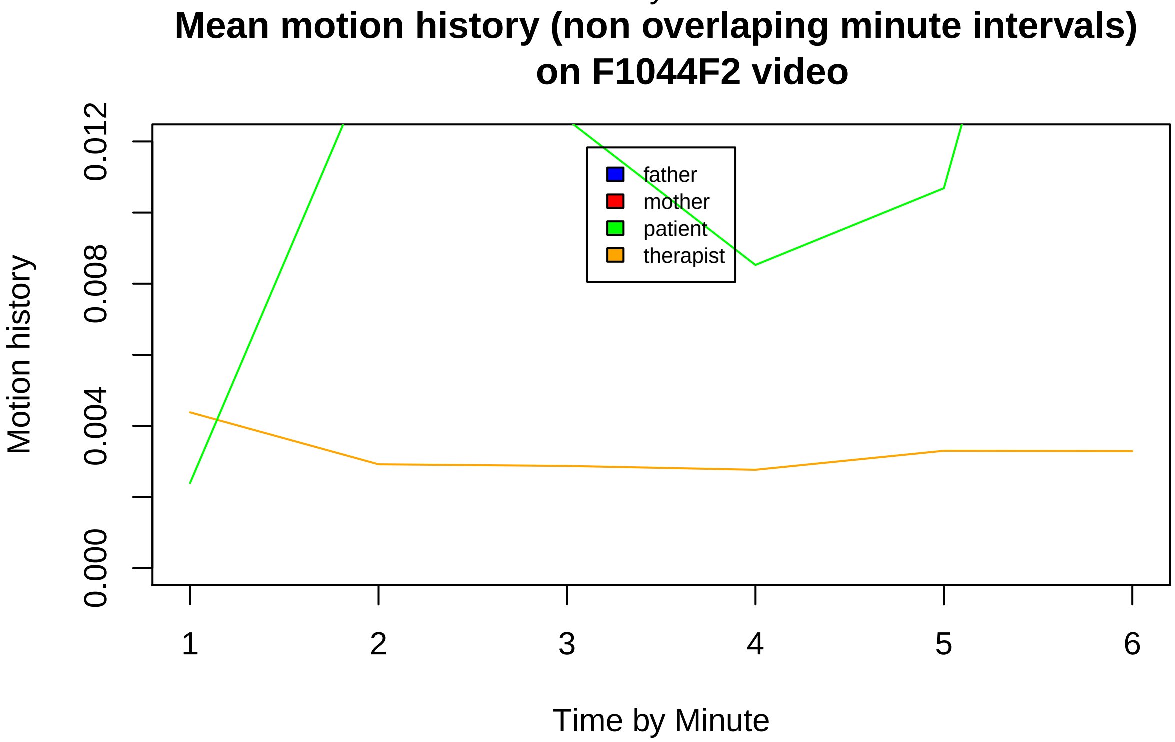
Mean motion history (non overlaping minute intervals) on F1044D2 video



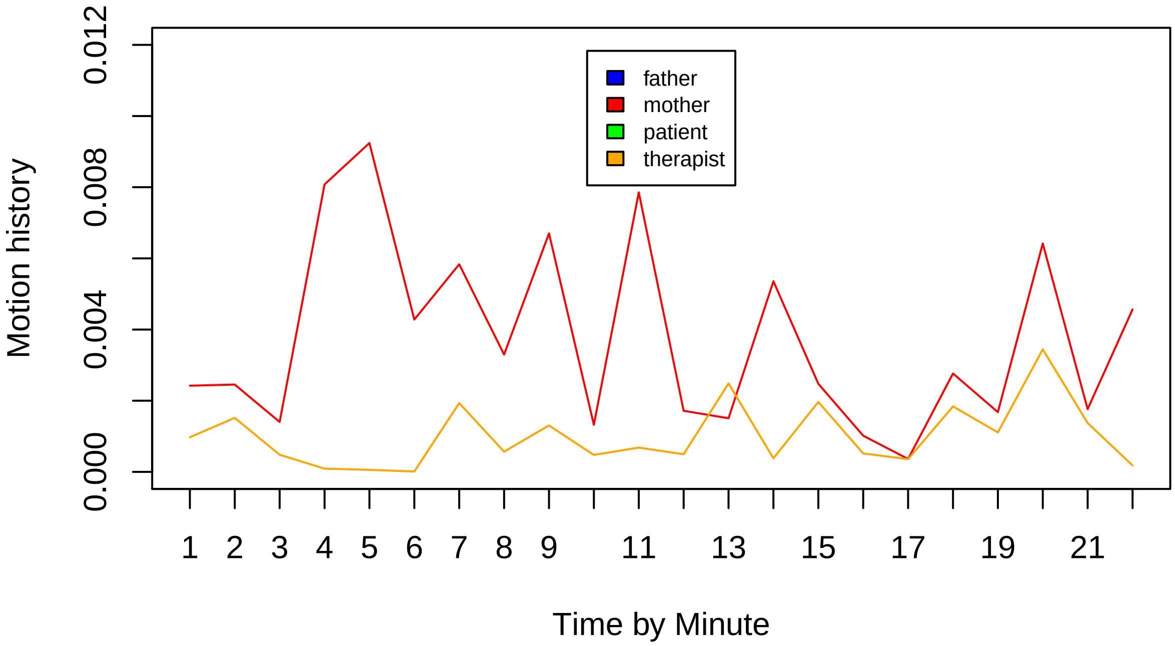

Mean motion history (non overlaping minute intervals)
on F1044E1 video
Motion history
0.000
0.004
0.008
0.012
Time by Minute
1
2
3
4
5
6
7
🟦 father
🟥 mother
🟩 patient
🟧 therapist


Mean motion history (non overlaping minute intervals)
on F1044E2 video
Motion history
0.000
0.004
0.008
0.012
Time by Minute
1
2
3
🟦 father
🟥 mother
🟩 patient
🟧 therapist

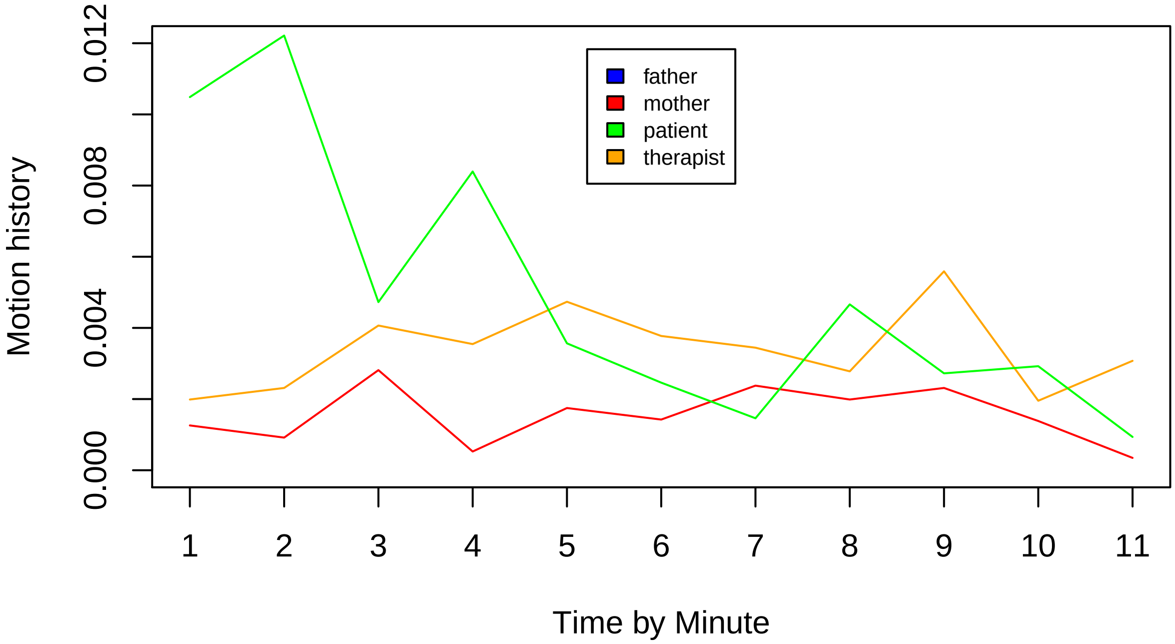

Mean motion history (non overlaping minute intervals)
on F1044F1 video
Motion history
0.000
0.004
0.008
0.012
🟦 father
🟥 mother
🟩 patient
🟧 therapist
1
2
3
Time by Minute

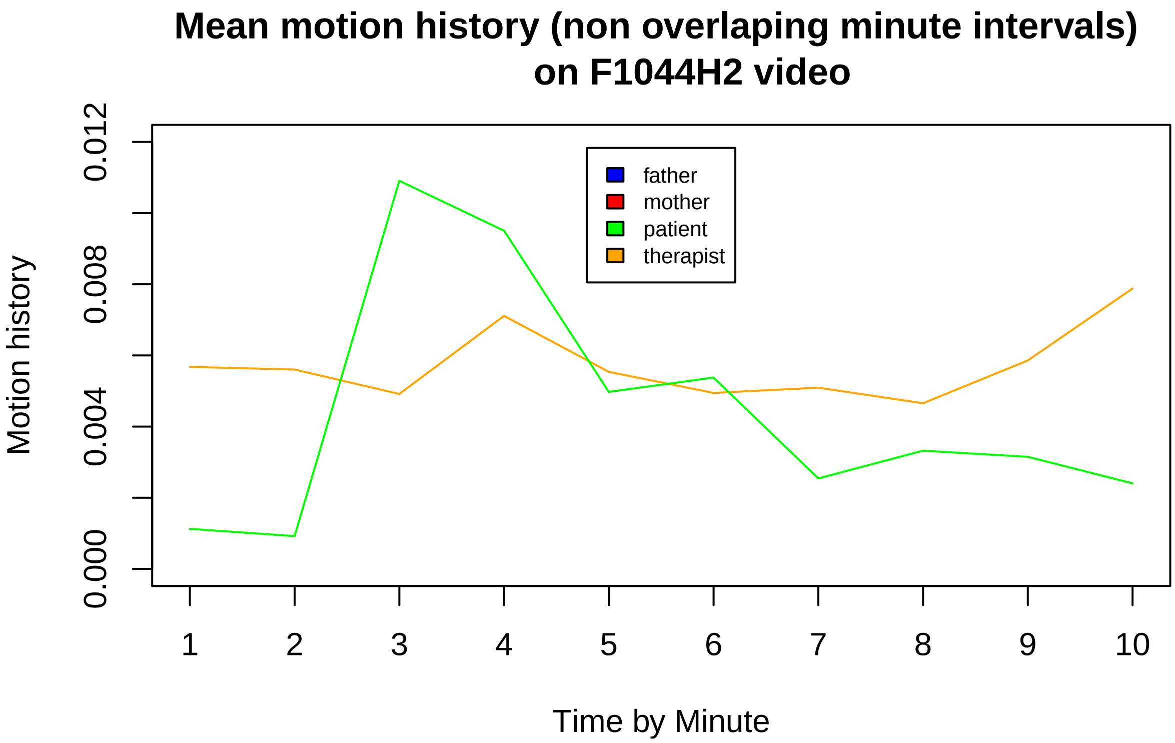

Mean motion history (non overlaping minute intervals)
on F1044F2 video
Motion history
0.000
0.004
0.008
0.012
🟦 father
🟥 mother
🟩 patient
🟧 therapist
1
2
3
4
5
6
Time by Minute

Mean motion history (non overlaping minute intervals) on F1044G video

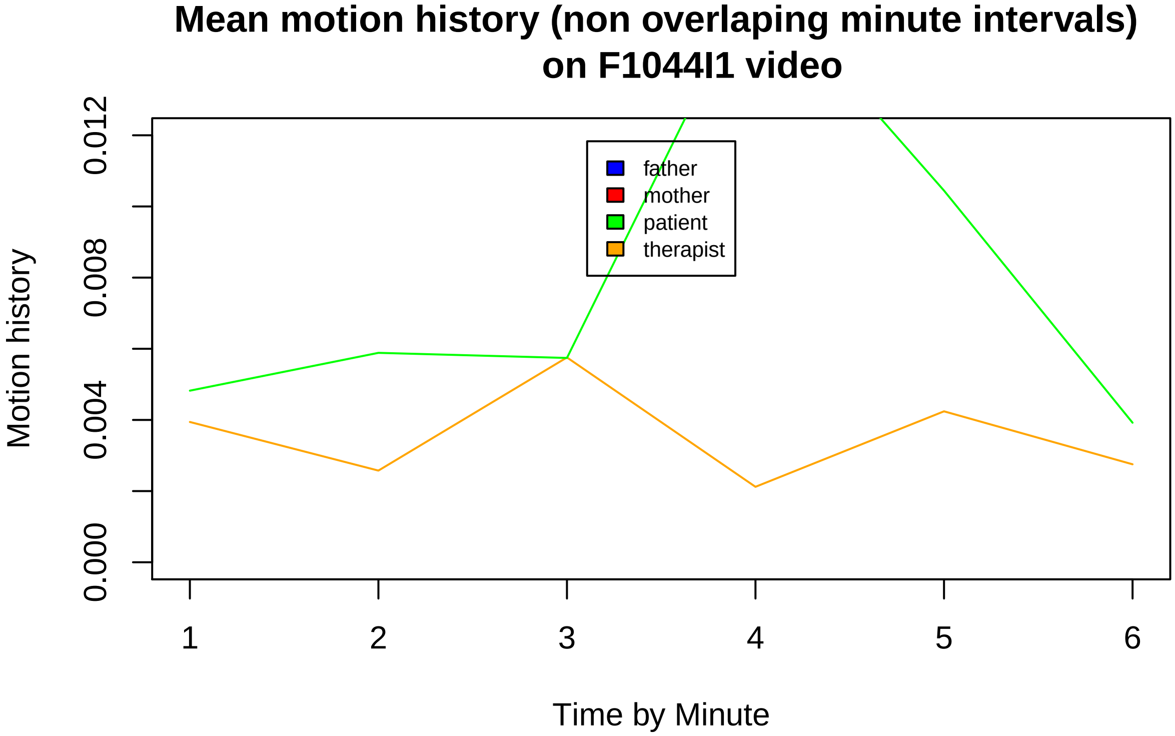


Mean motion history (non overlaping minute intervals) on F1044H1 video



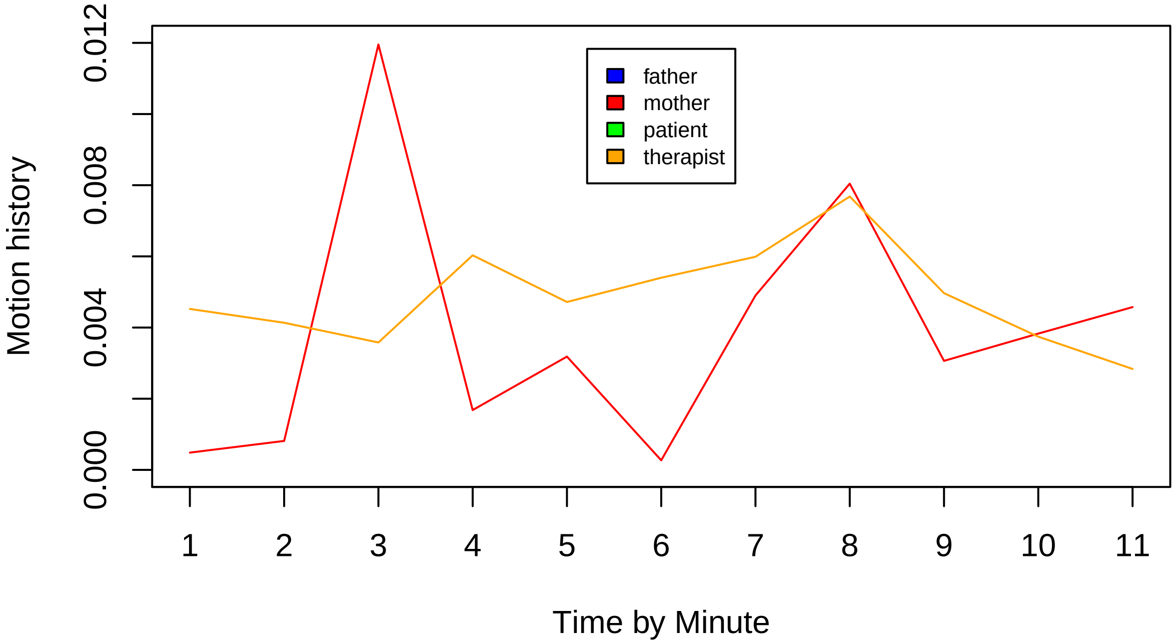


Mean motion history (non overlaping minute intervals) on F1044H2 video

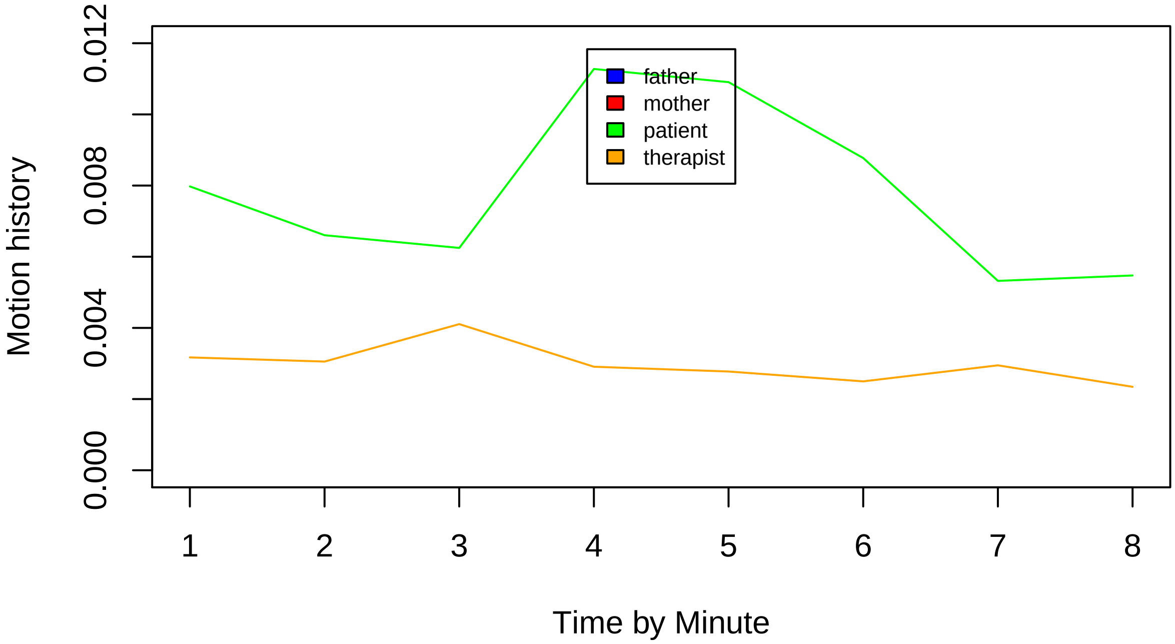


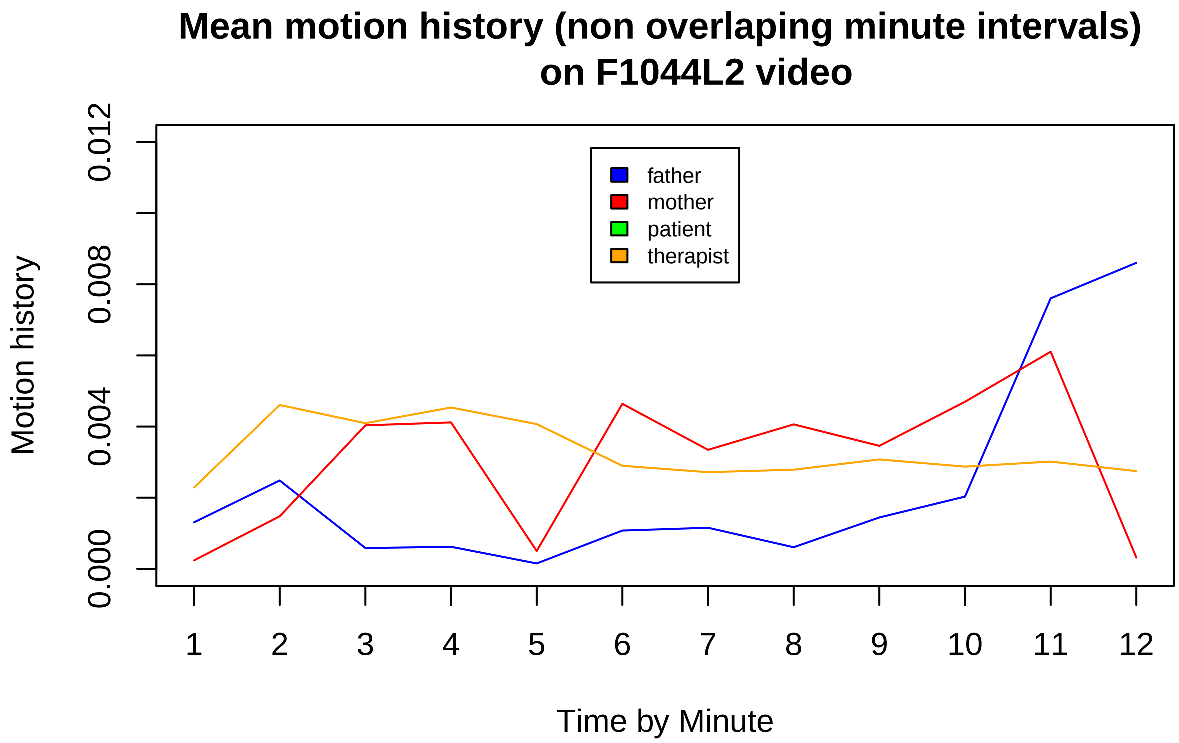
Mean motion history (non overlaping minute intervals) on F1044I1 video

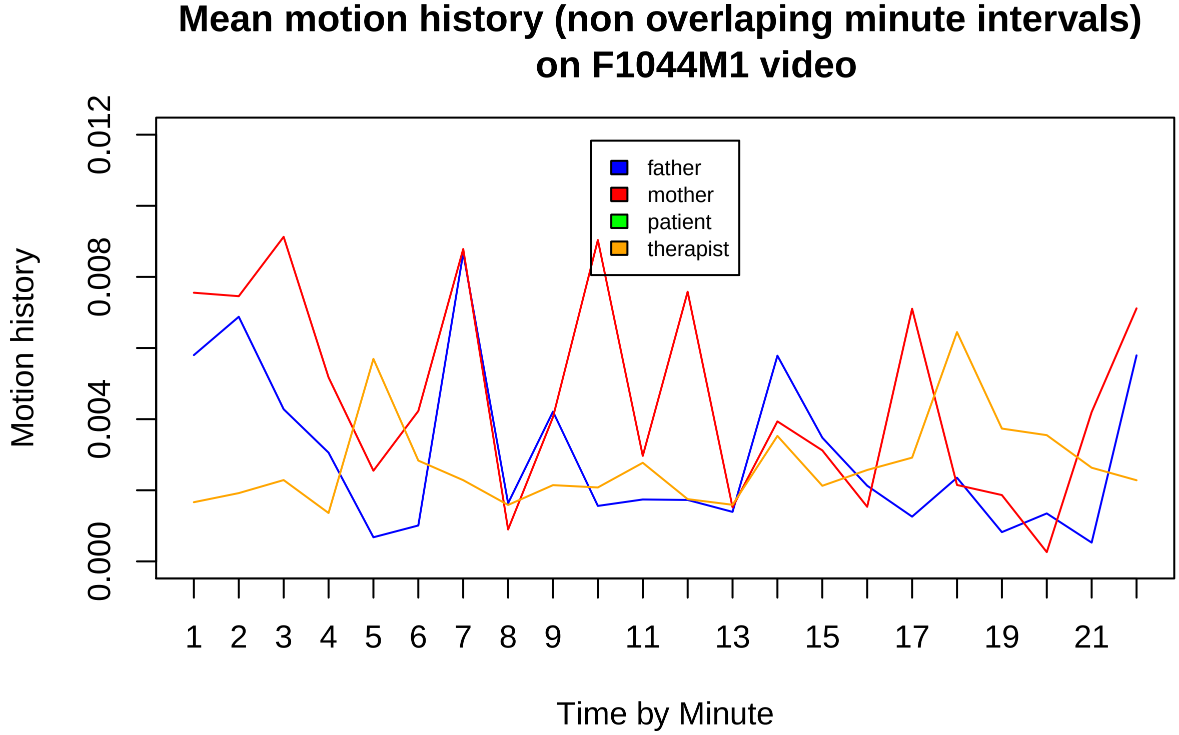
Mean motion history (non overlaping minute intervals) on F1044I2 video

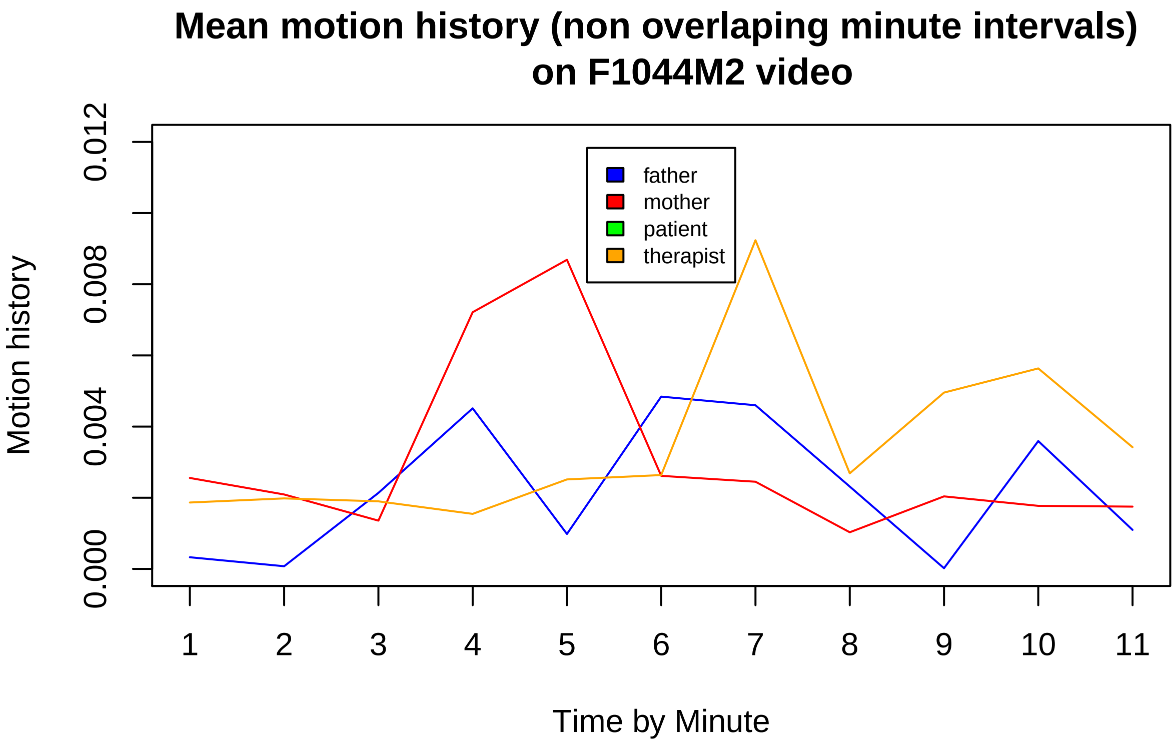


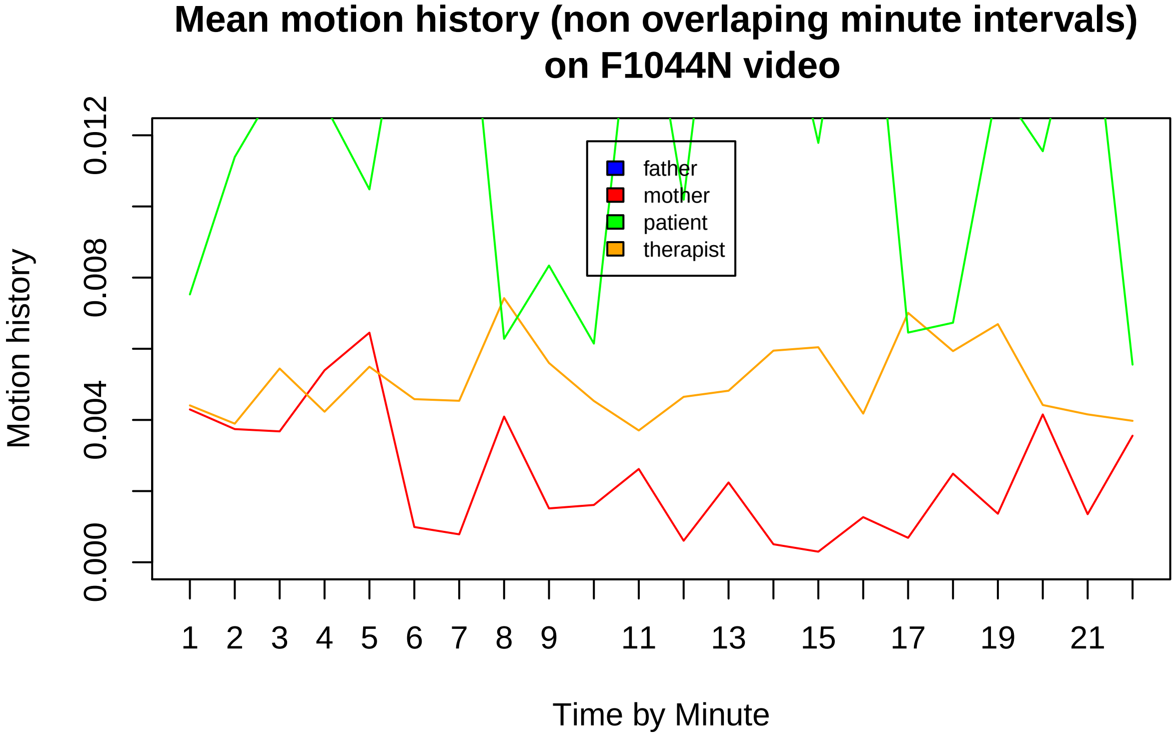
Mean motion history (non overlaping minute intervals) on F1044L1 video

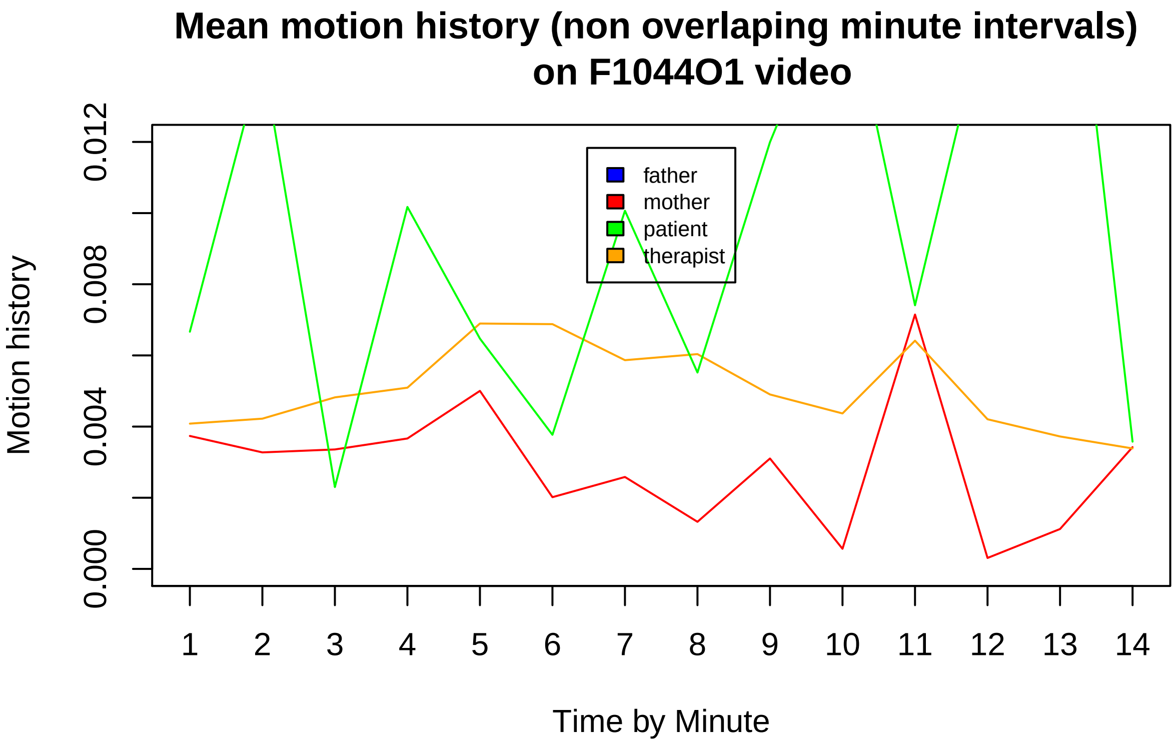


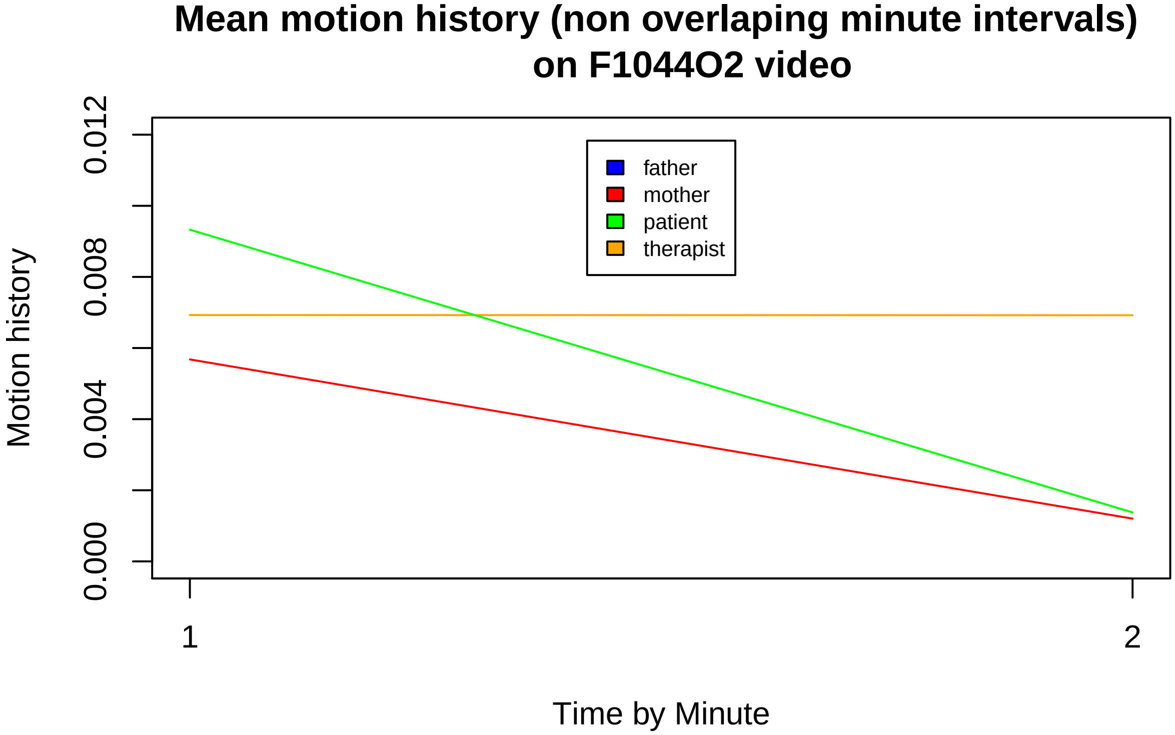

Mean motion history (non overlaping minute intervals)
on F1044L2 video
father
mother
patient
therapist
Motion history
0.000
0.004
0.008
0.012
1
2
3
4
5
6
7
8
9
10
11
12
Time by Minute

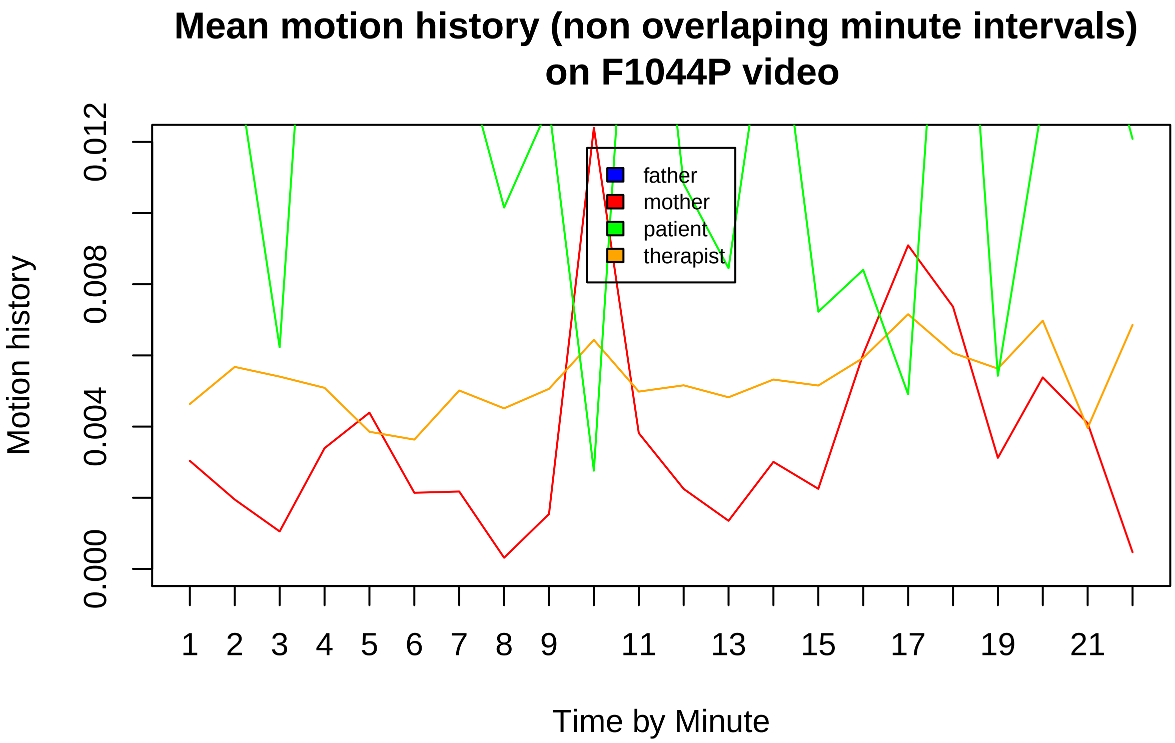

Mean motion history (non overlaping minute intervals)
on F1044M1 video
father
mother
patient
therapist
Motion history
0.000
0.004
0.008
0.012
1
2
3
4
5
6
7
8
9
11
13
15
17
19
21
Time by Minute

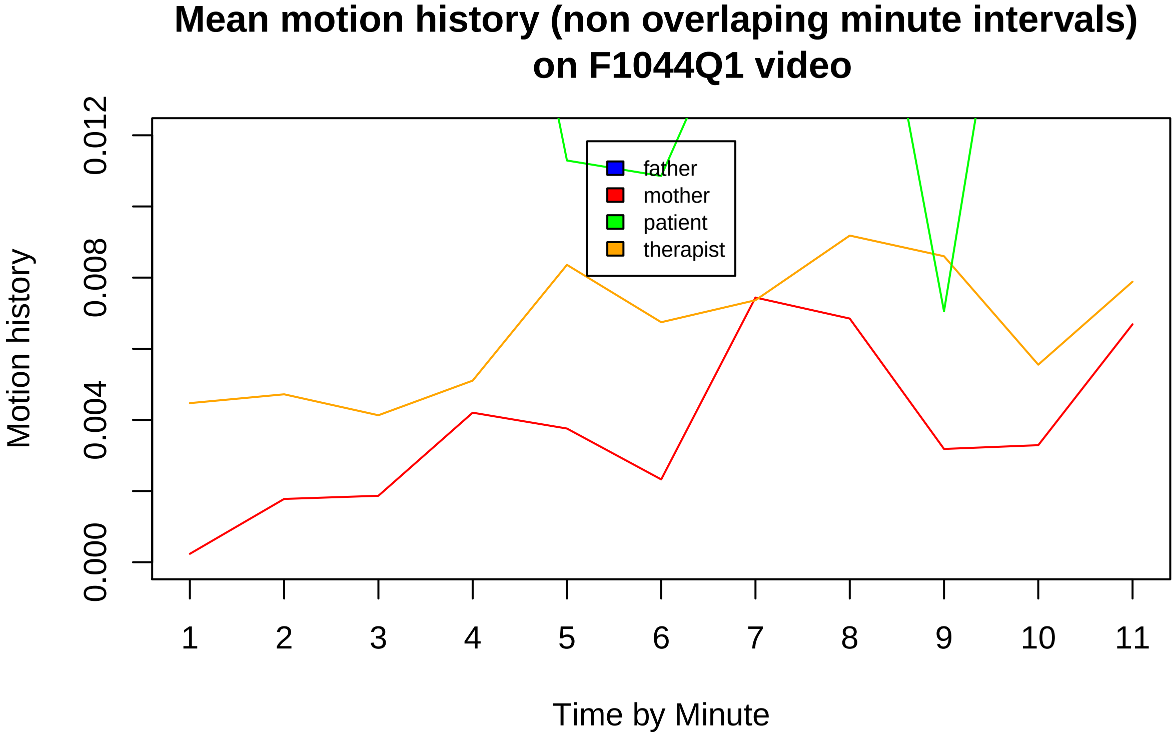

Mean motion history (non overlaping minute intervals)
on F1044M2 video
Motion history
0.000
0.004
0.008
0.012
Time by Minute
1
2
3
4
5
6
7
8
9
10
11
🟦 father
🟥 mother
🟩 patient
🟧 therapist

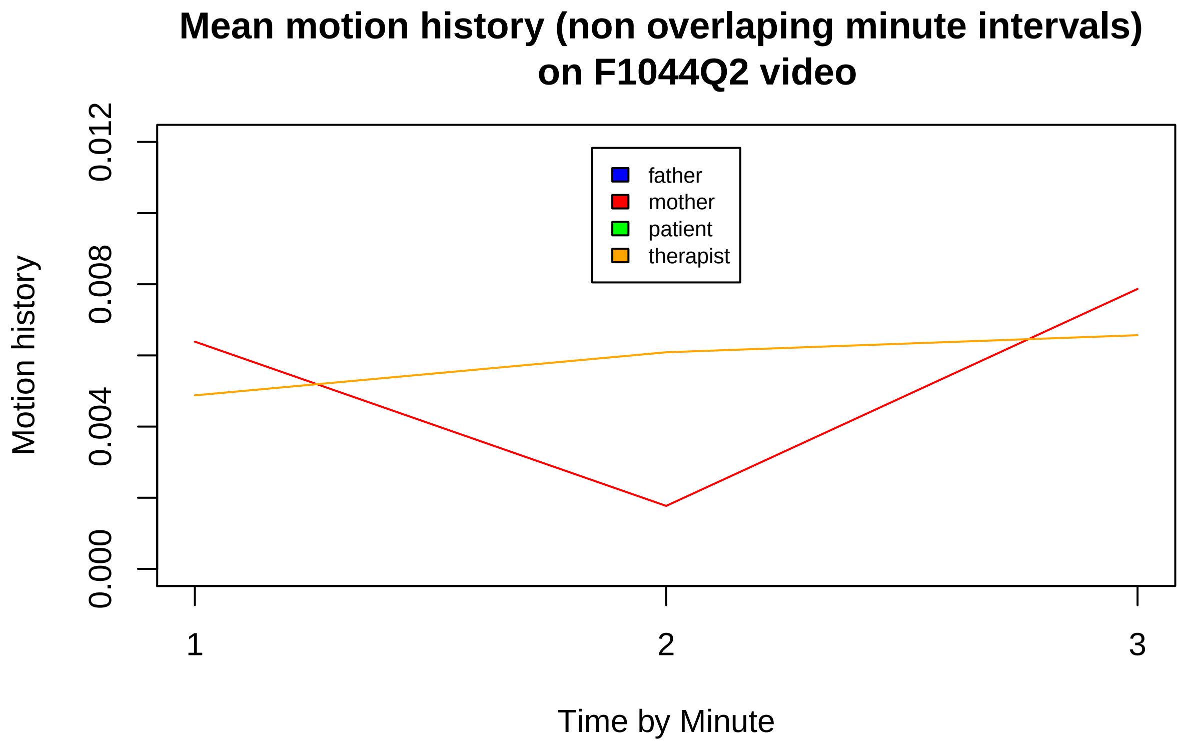

Mean motion history (non overlaping minute intervals)
on F1044N video
Motion history
0.000
0.004
0.008
0.012
Time by Minute
1
2
3
4
5
6
7
8
9
11
13
15
17
19
21
🟦 father
🟥 mother
🟩 patient
🟧 therapist

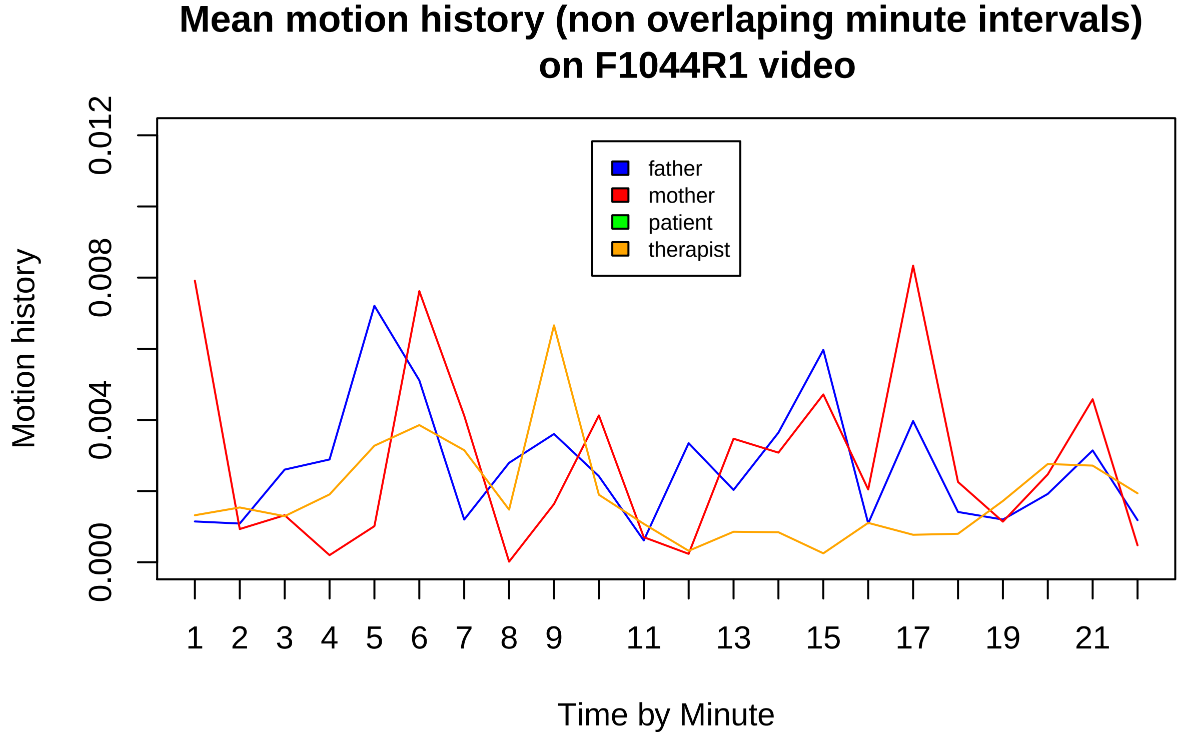

Mean motion history (non overlaping minute intervals) on F1044O1 video

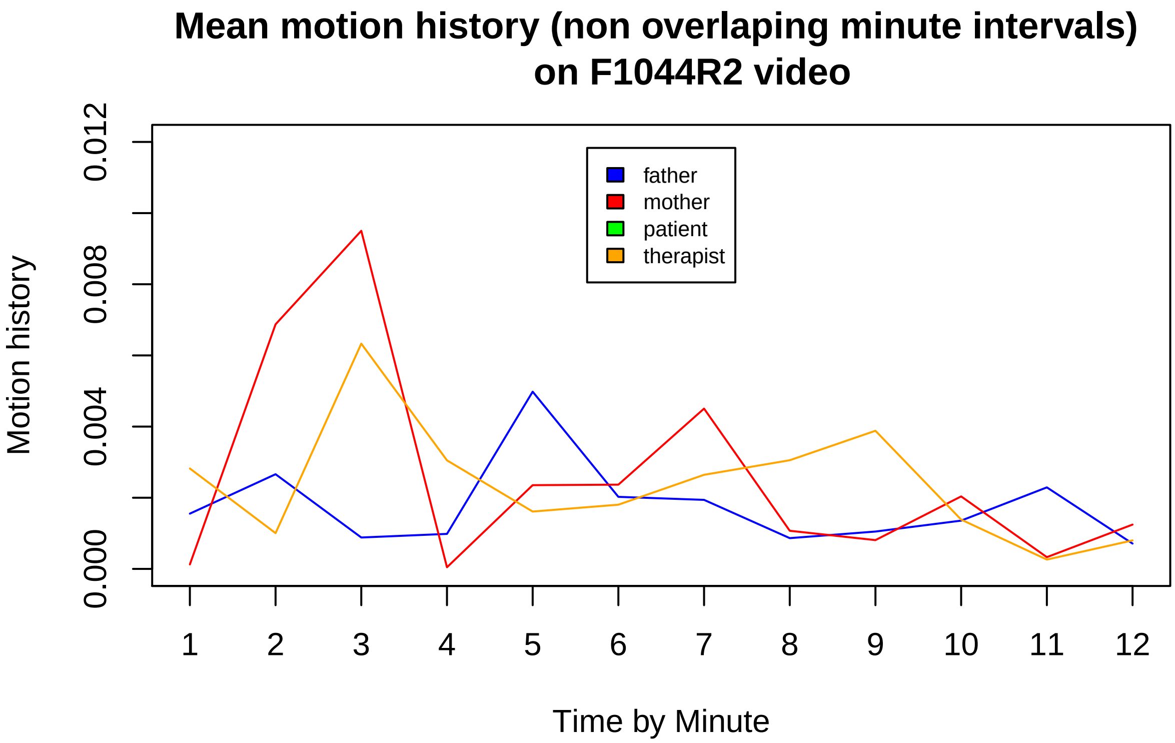

Mean motion history (non overlaping minute intervals) on F1044O2 video

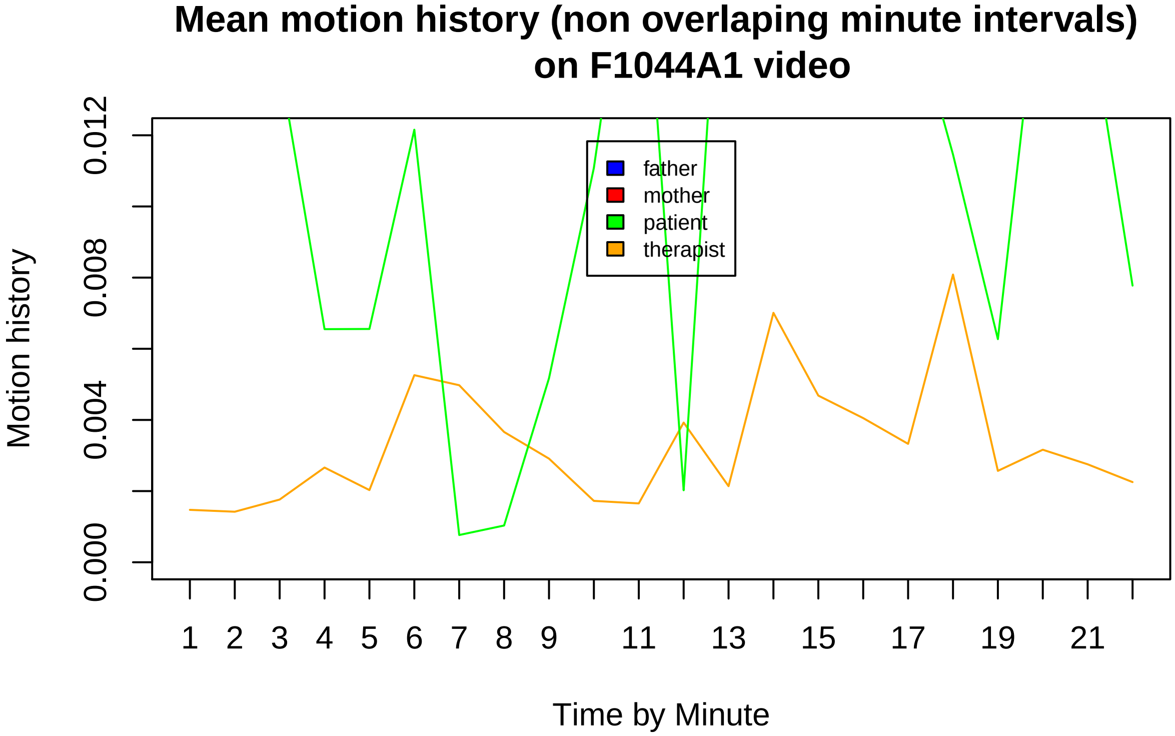

Mean motion history (non overlaping minute intervals)
on F1044P video
Motion history
0.000
0.004
0.008
0.012
1
2
3
4
5
6
7
8
9
11
13
15
17
19
21
Time by Minute
🟦 father
🟥 mother
🟩 patient
🟧 therapist

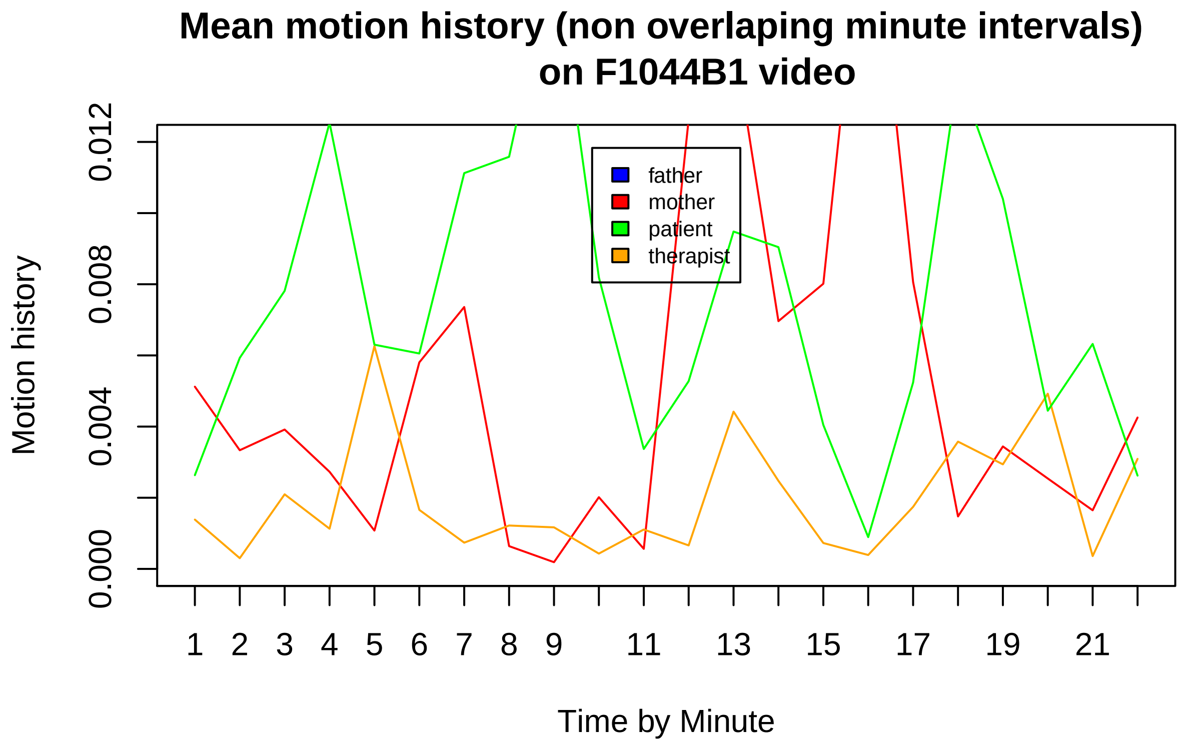

Mean motion history (non overlaping minute intervals)
on F1044Q1 video
Motion history
0.000
0.004
0.008
0.012
1
2
3
4
5
6
7
8
9
10
11
Time by Minute
🟦 father
🟥 mother
🟩 patient
🟧 therapist

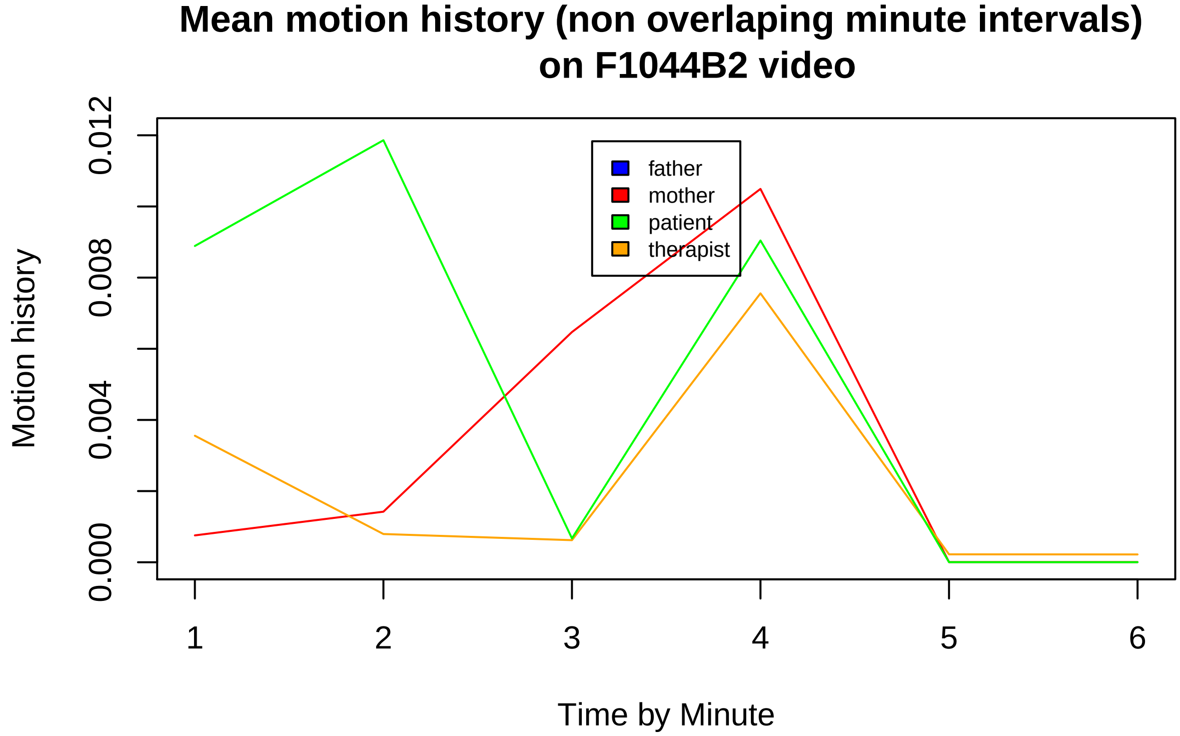

Mean motion history (non overlaping minute intervals)
on F1044Q2 video
Motion history
0.000
0.004
0.008
0.012
Time by Minute
1
2
3
🟦 father
🟥 mother
🟩 patient
🟧 therapist

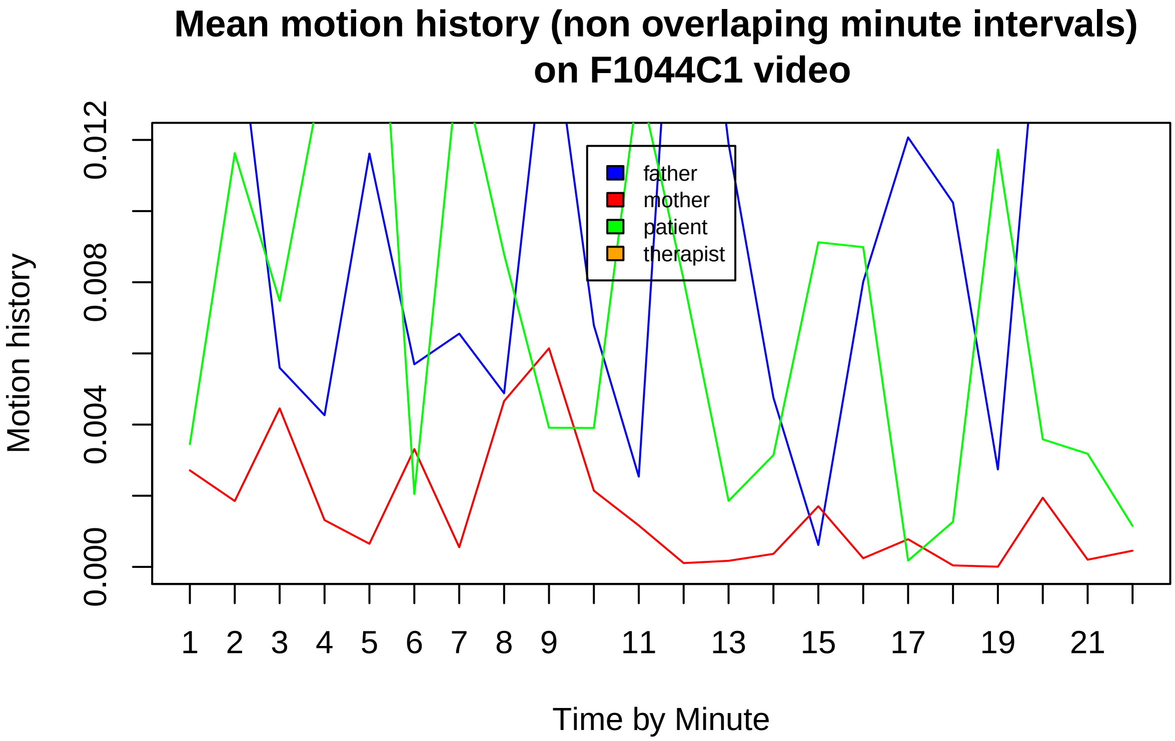

Mean motion history (non overlaping minute intervals)
on F1044R1 video
Motion history
0.000
0.004
0.008
0.012
Time by Minute
1
2
3
4
5
6
7
8
9
11
13
15
17
19
21
🟦 father
🟥 mother
🟩 patient
🟧 therapist

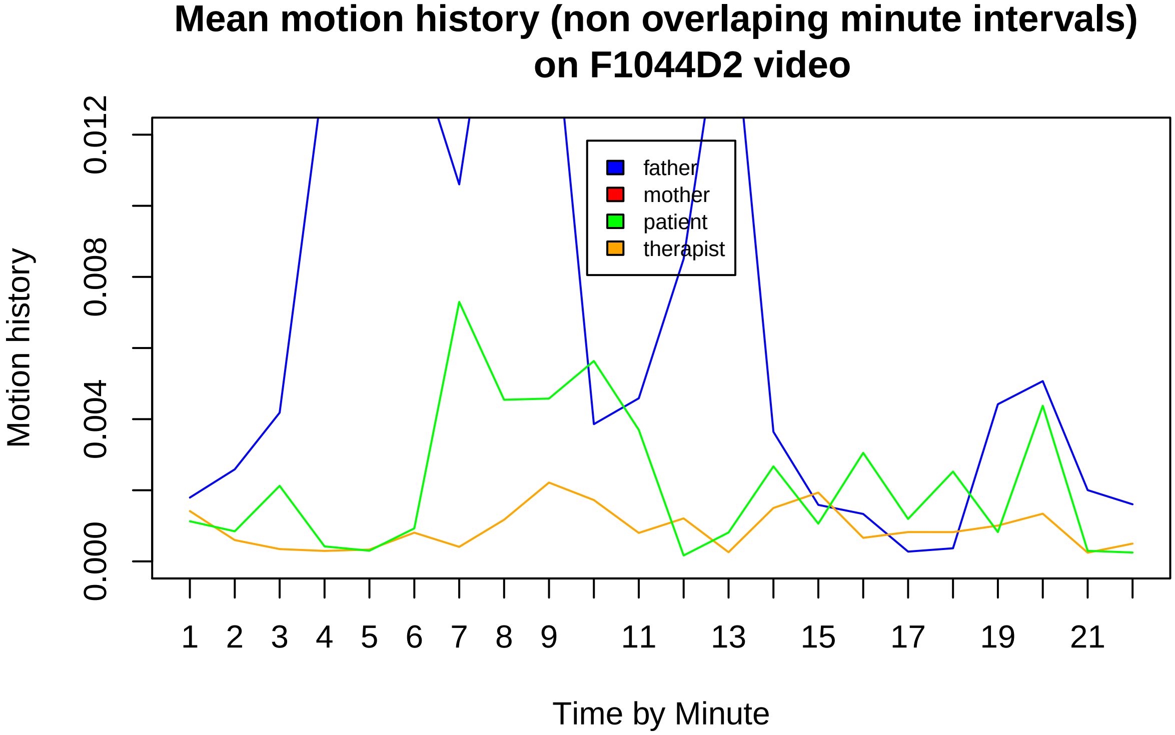

Mean motion history (non overlaping minute intervals)
on F1044R2 video
Motion history
0.000
0.004
0.008
0.012
father
mother
patient
therapist
1
2
3
4
5
6
7
8
9
10
11
12
Time by Minute

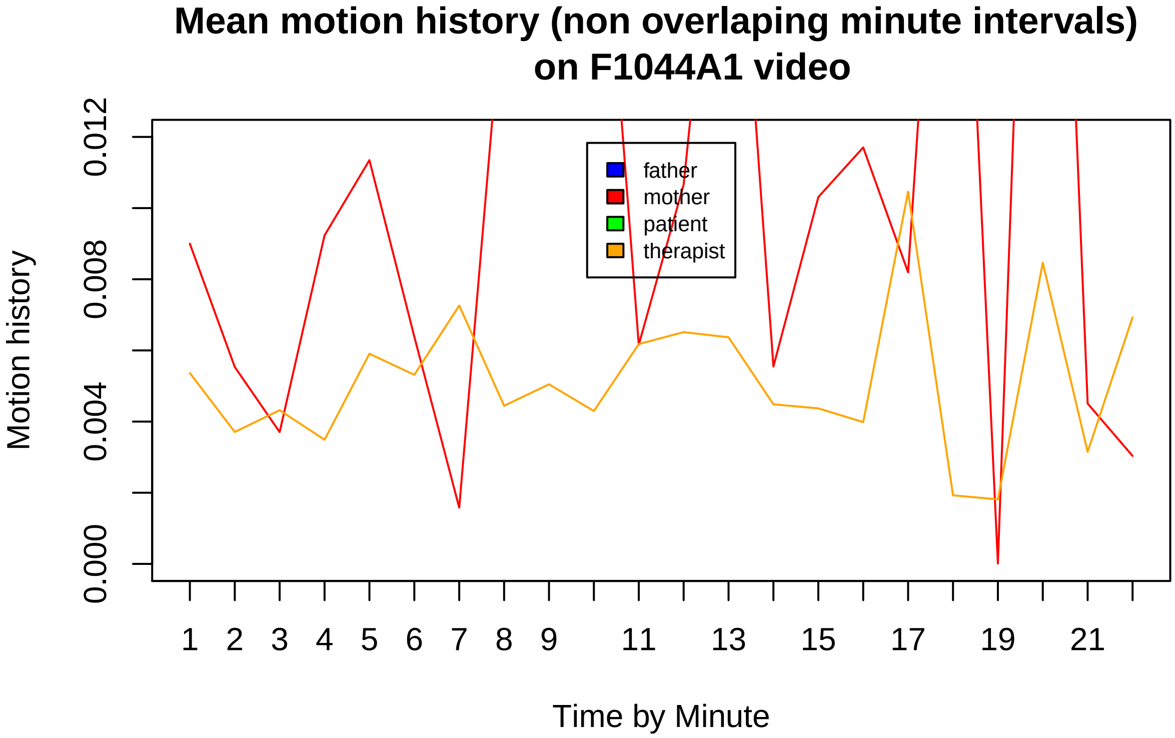

Mean motion history (non overlaping minute intervals)
on F1044A1 video
Motion history
0.000
0.004
0.008
0.012
father
mother
patient
therapist
1
2
3
4
5
6
7
8
9
11
13
15
17
19
21
Time by Minute


Mean motion history (non overlaping minute intervals) on F1044B1 video

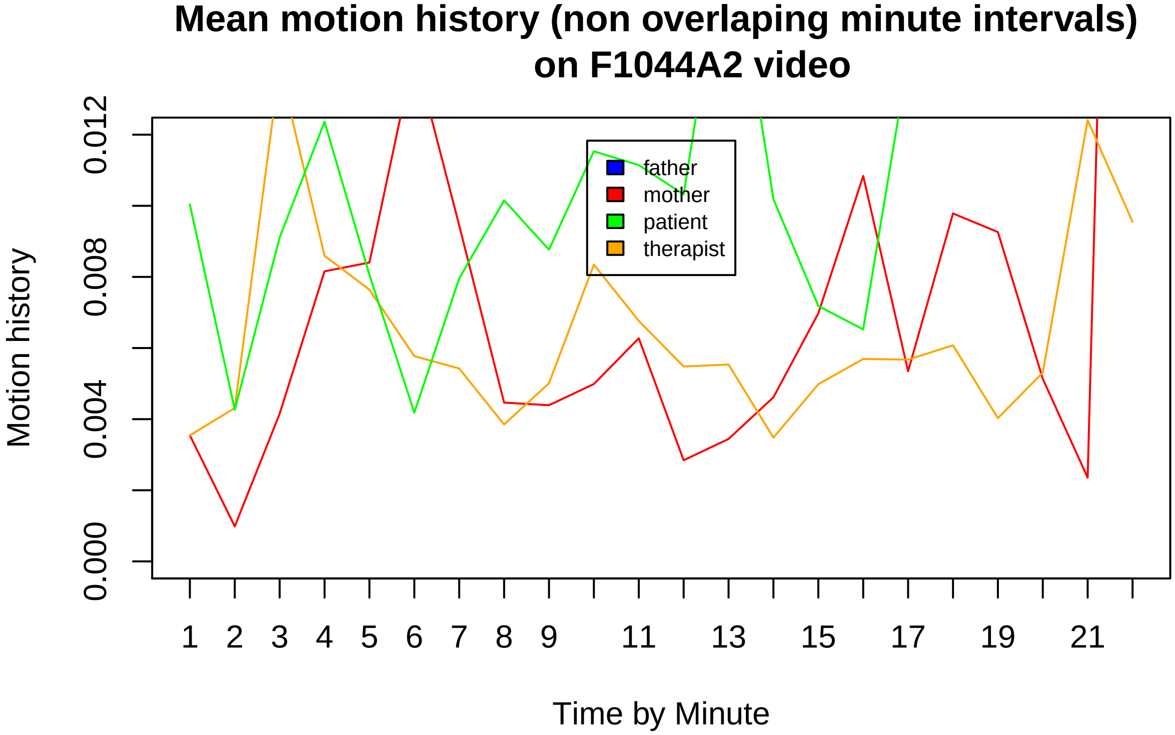

Mean motion history (non overlaping minute intervals) on F1044B2 video


Mean motion history (non overlaping minute intervals)
on F1044C1 video
Motion history
0.000
0.004
0.008
0.012
1
2
3
4
5
6
7
8
9
11
13
15
17
19
21
Time by Minute
🟦 father
🟥 mother
🟩 patient
🟧 therapist

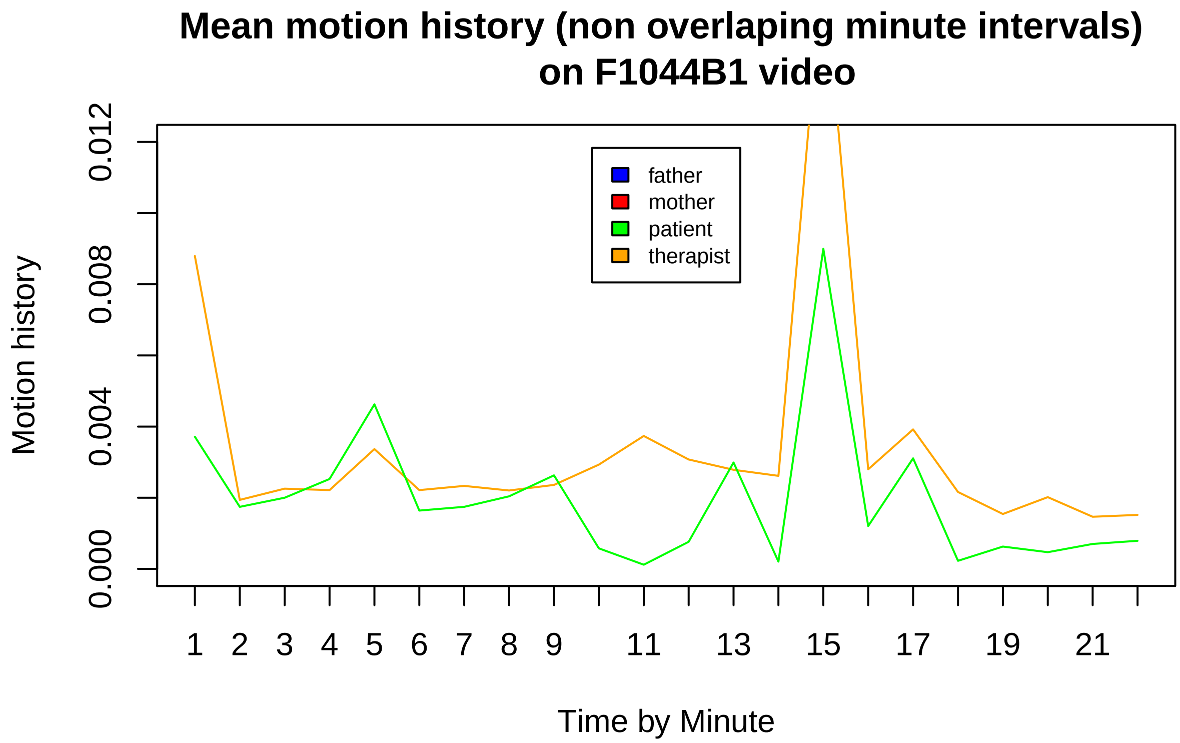

Mean motion history (non overlaping minute intervals)
on F1044D2 video
Motion history
0.000
0.004
0.008
0.012
1
2
3
4
5
6
7
8
9
11
13
15
17
19
21
Time by Minute
🟦 father
🟥 mother
🟩 patient
🟧 therapist

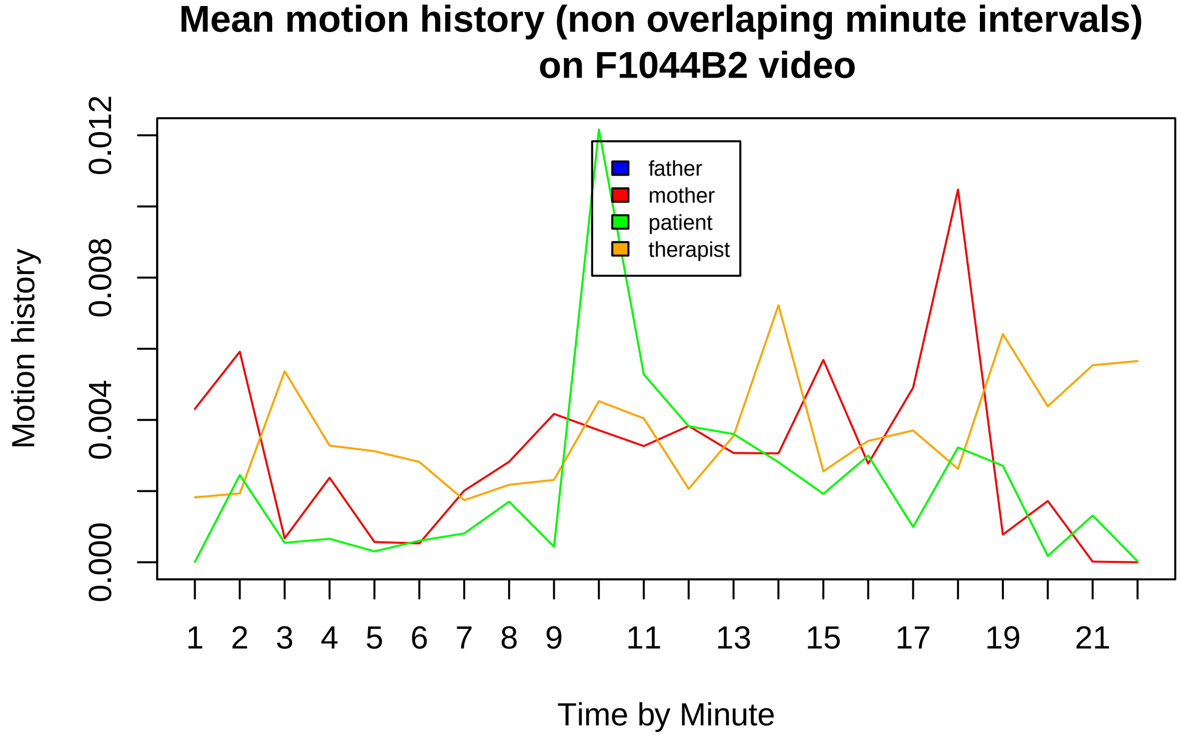


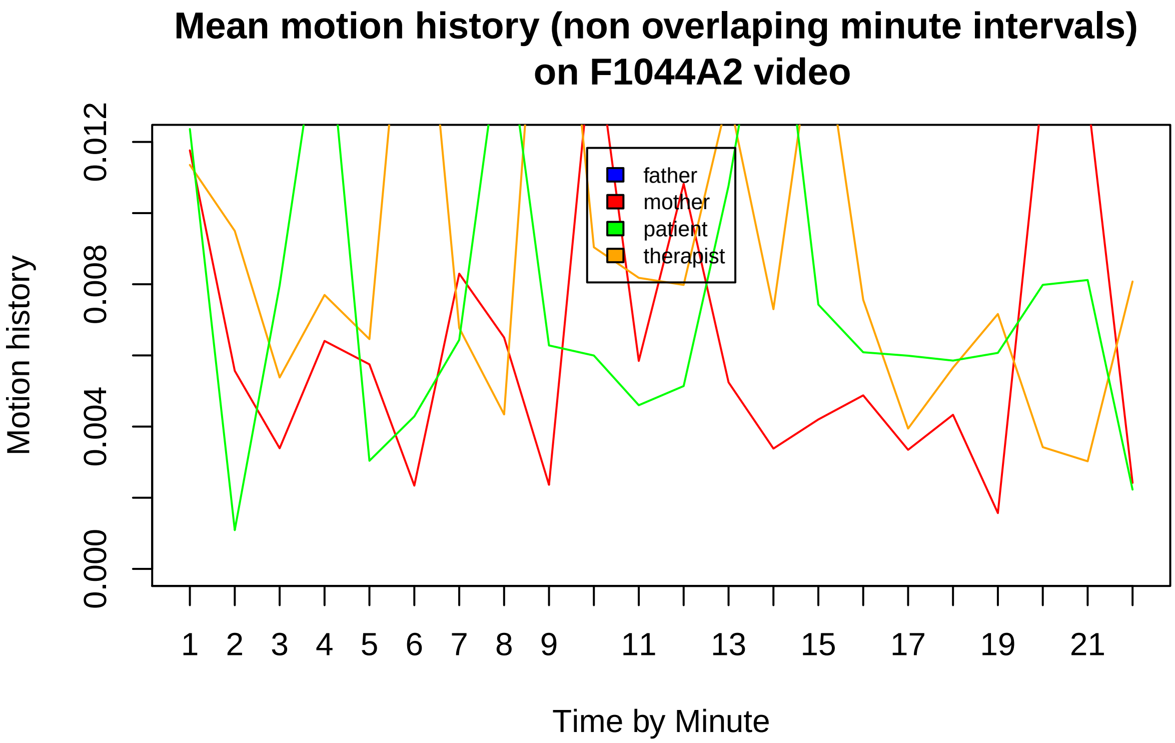
Mean motion history (non overlaping minute intervals) on F1044A1 video

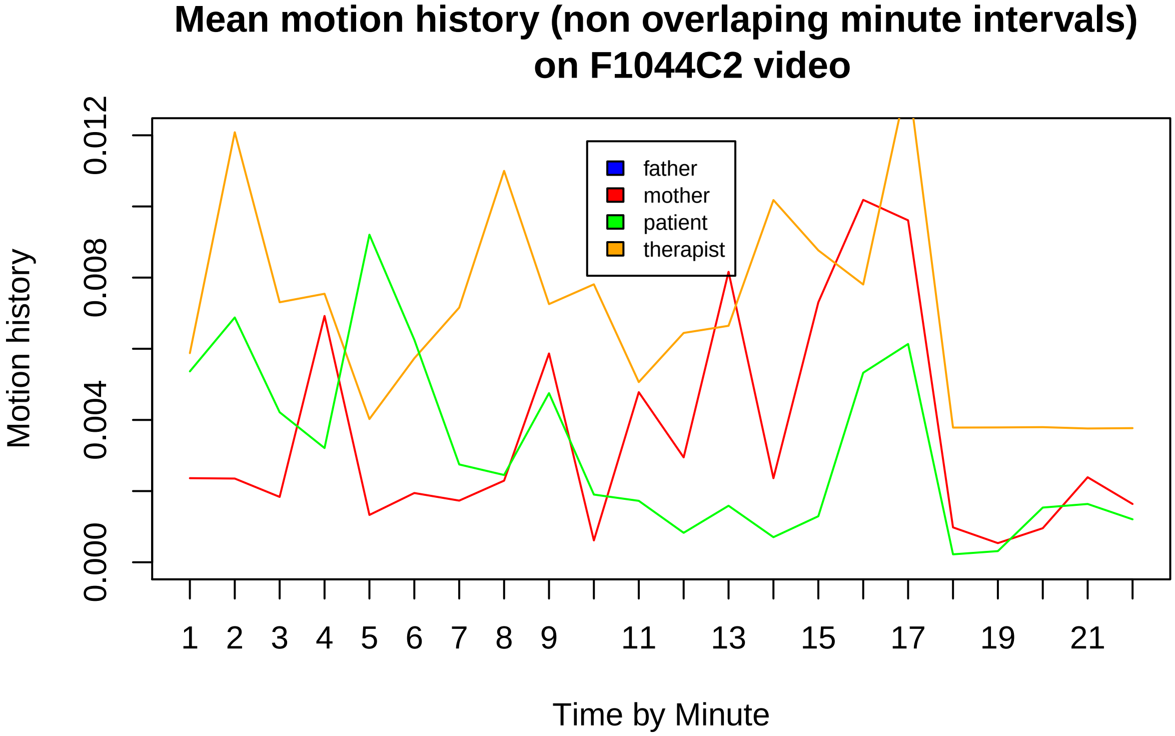


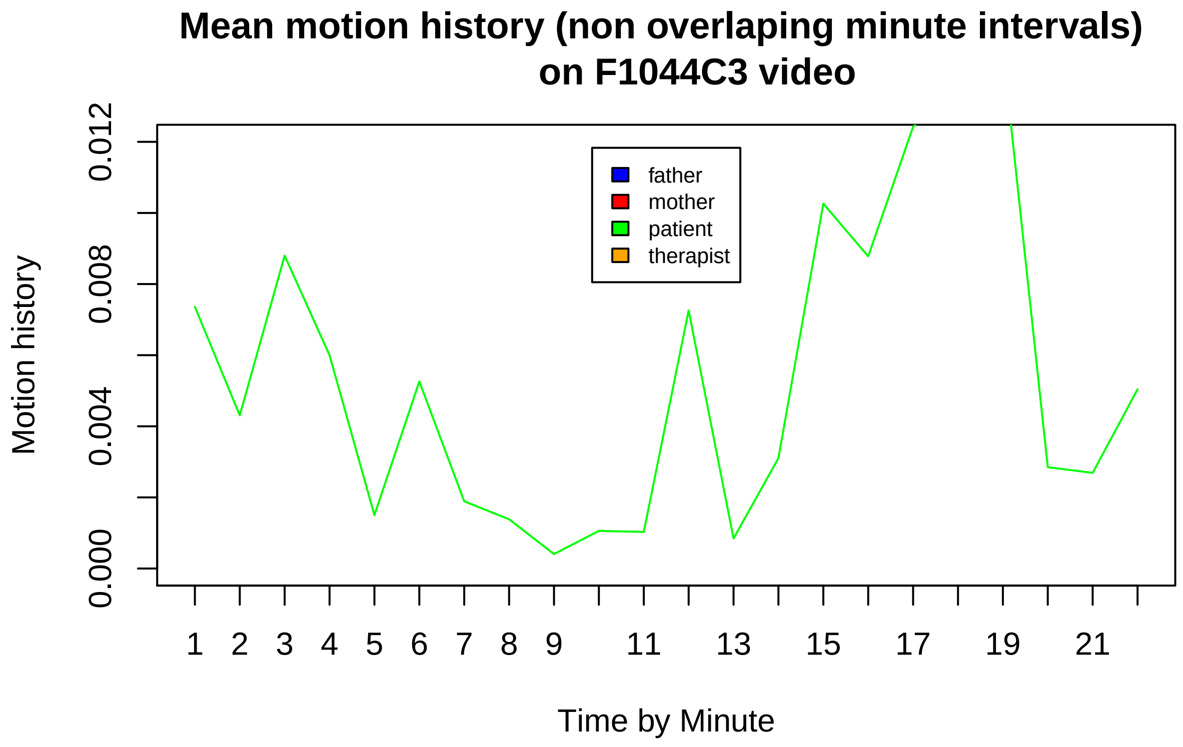
Mean motion history (non overlaping minute intervals) on F1044A2 video


Mean motion history (non overlaping minute intervals)
on F1044B1 video
Motion history
0.000
0.004
0.008
0.012
🟦 father
🟥 mother
🟩 patient
🟧 therapist
1
2
3
4
5
6
7
8
9
11
13
15
17
19
21
Time by Minute


Mean motion history (non overlaping minute intervals)
on F1044B2 video
Motion history
0.000
0.004
0.008
0.012
🟦 father
🟥 mother
🟩 patient
🟧 therapist
1
2
3
4
5
6
7
8
9
11
13
15
17
19
21
Time by Minute


Mean motion history (non overlaping minute intervals)
on F1044A2 video
Motion history
0.000
0.004
0.008
0.012
1
2
3
4
5
6
7
8
9
11
13
15
17
19
21
Time by Minute
father
mother
patient
therapist

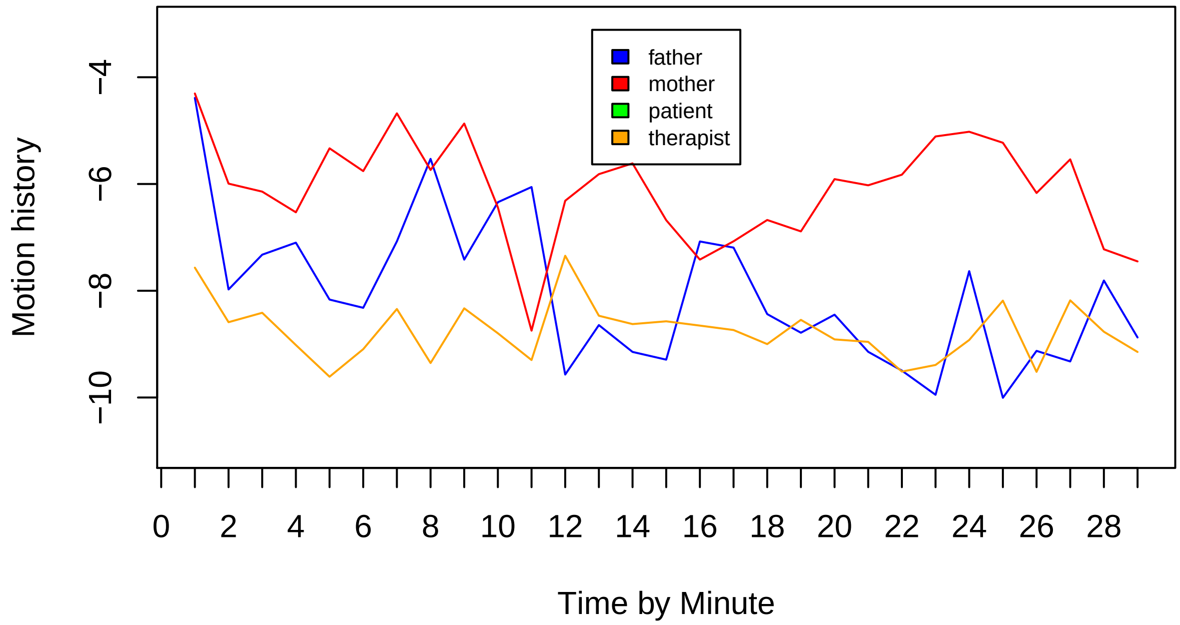

Mean motion history (non overlaping minute intervals)
on F1044C2 video
Motion history
0.000
0.004
0.008
0.012
1
2
3
4
5
6
7
8
9
11
13
15
17
19
21
Time by Minute
father
mother
patient
therapist



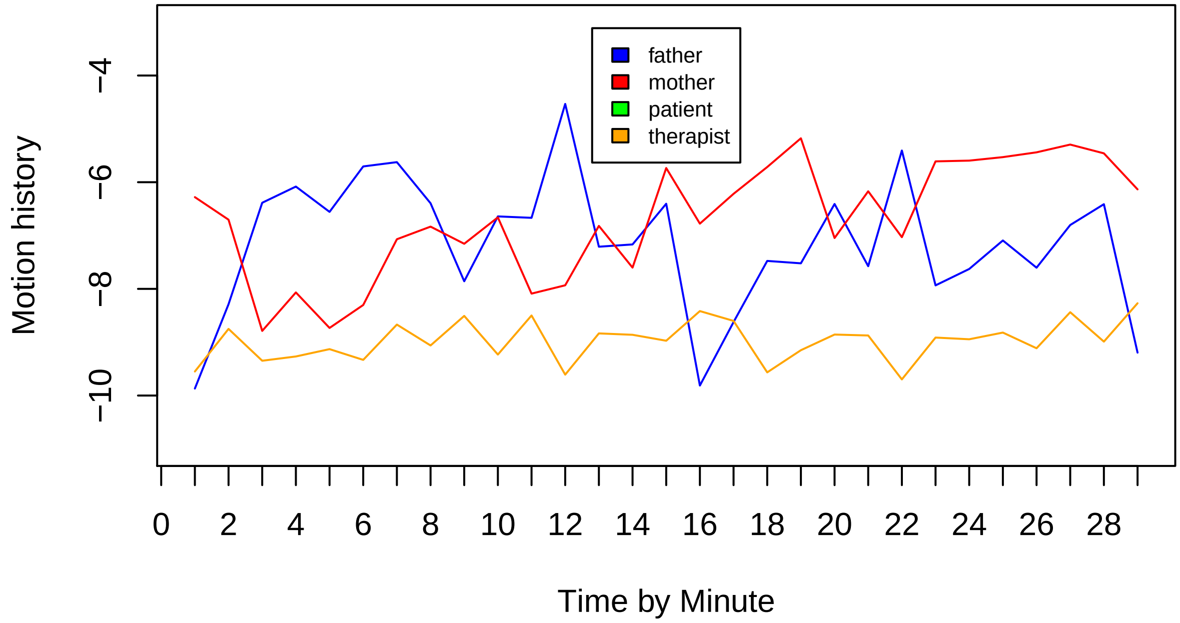
Mean log motion history by minute plots

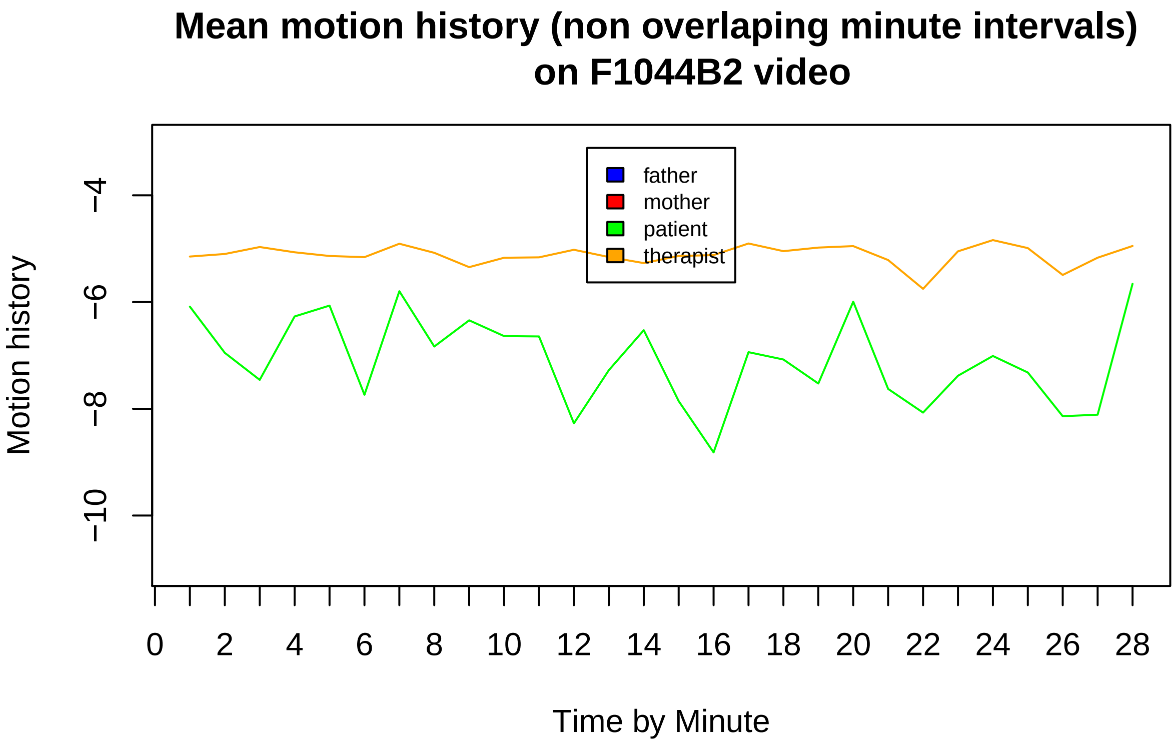
```
for (i in 1:NumberOfvideos){
  fatherMinute<- MeanMotionByTime("logFather", indexOfvideos=i, interval=1500, data)

  MotherMinute<- MeanMotionByTime("logMother", indexOfvideos=i, interval=1500, data)

  TherapistMinute<- MeanMotionByTime("logTherapist", indexOfvideos=i, interval=1500, data)

  PatientMinute<- MeanMotionByTime("logPatient", indexOfvideos=i, interval=1500, data)

  par(mar=c(4,4,4,2))
      plot (1:length(fatherMinute), fatherMinute, type="l", col="blue",
      main=paste("Mean motion history (non overlaping minute intervals)
      on F1044", labelvideolist[i], " video" , sep=""),
      ylab="Motion history", xlab="Time by Minute", ylim=c(-11, -3),
      xaxp=c(0, length(fatherMinute), length(fatherMinute)))
      lines(MotherMinute, col="red")
      lines(TherapistMinute, col="orange")
      lines(PatientMinute, col="green")
      legend("top", inset=.05, ParticipantsList,
             fill=colOrderList, cex=0.7)}
```

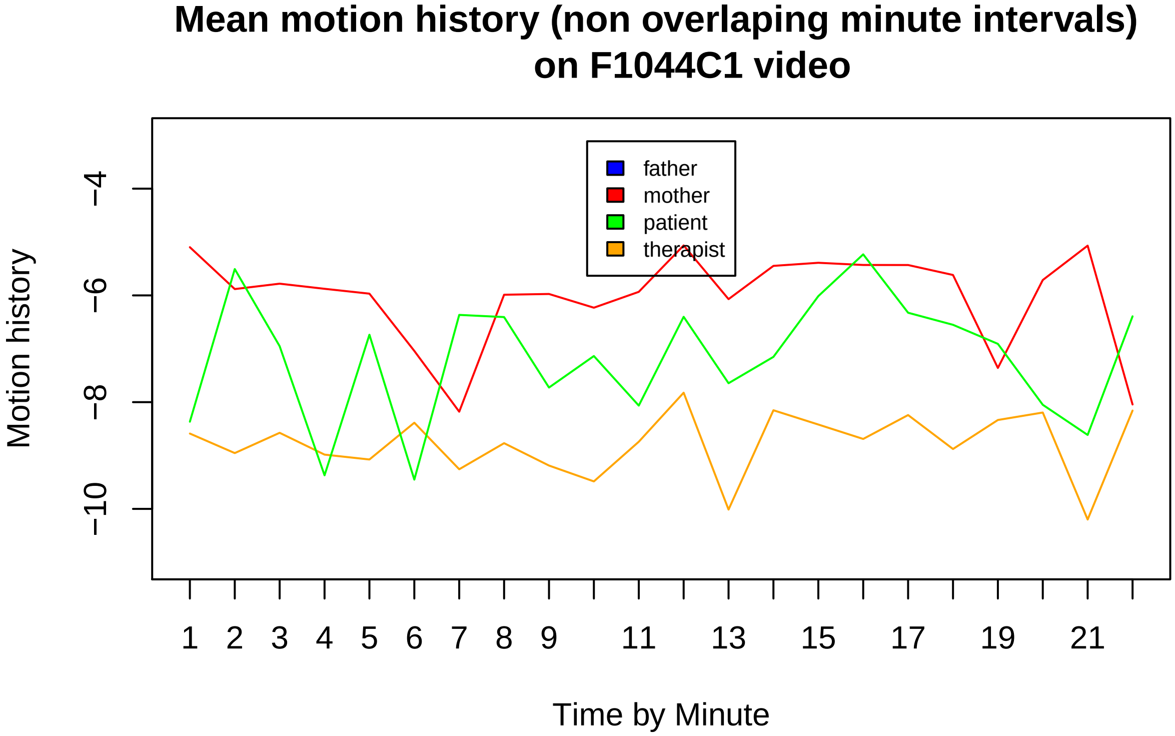
Mean motion history (non overlaping minute intervals) on F1044A1 video



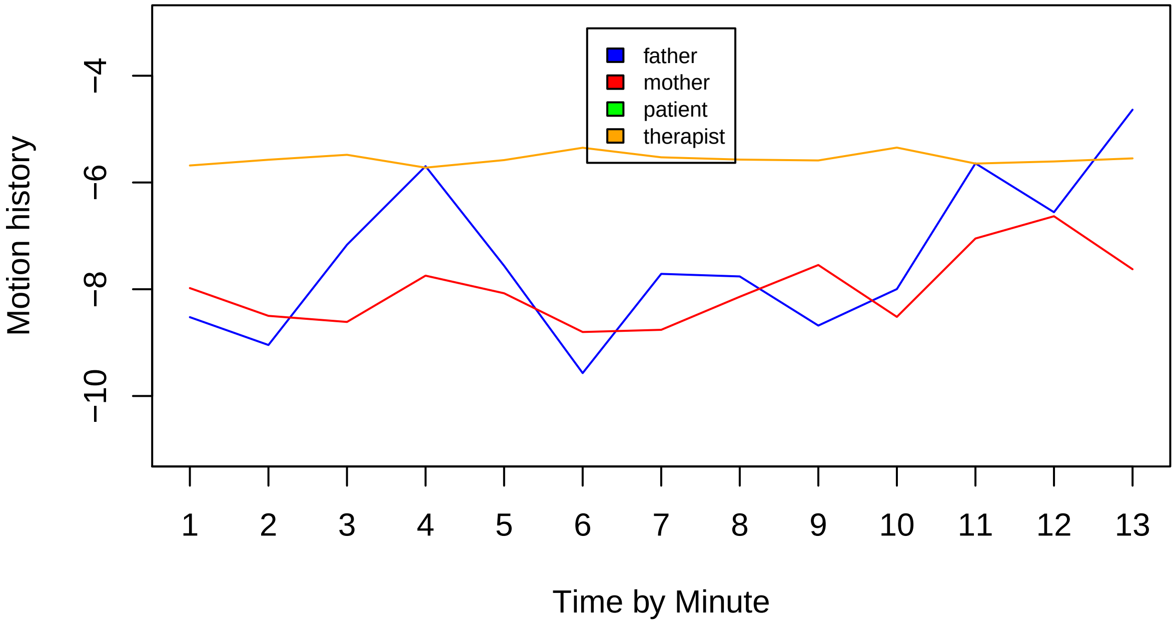
Mean motion history (non overlaping minute intervals) on F1044A2 video



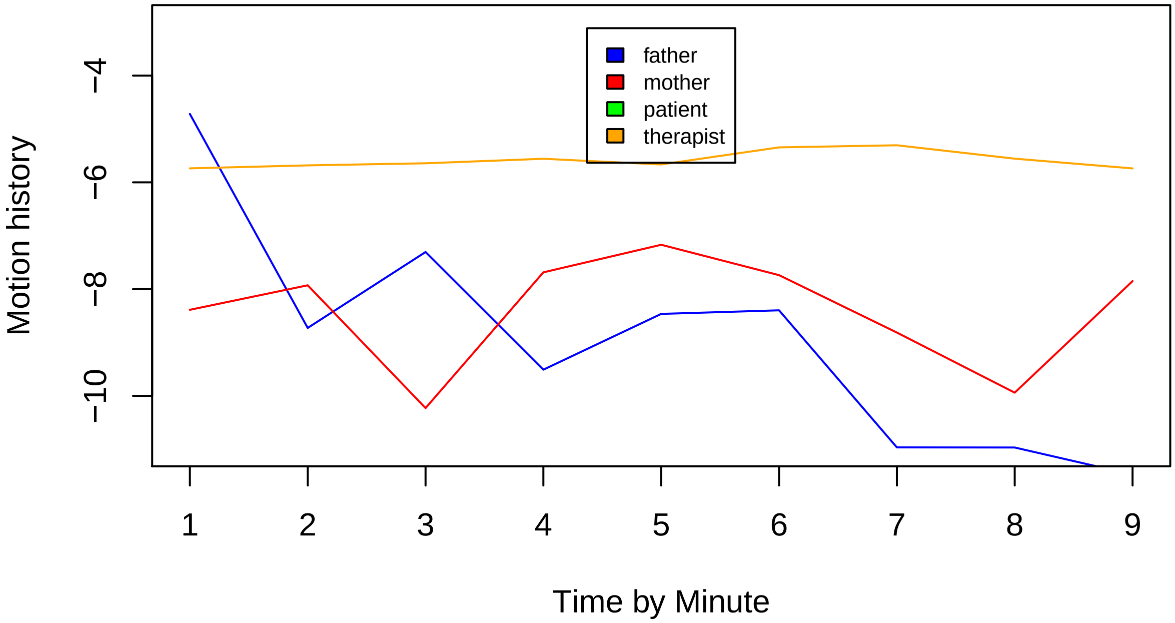

Mean motion history (non overlaping minute intervals)
on F1044B2 video


Mean motion history (non overlaping minute intervals)
on F1044C1 video

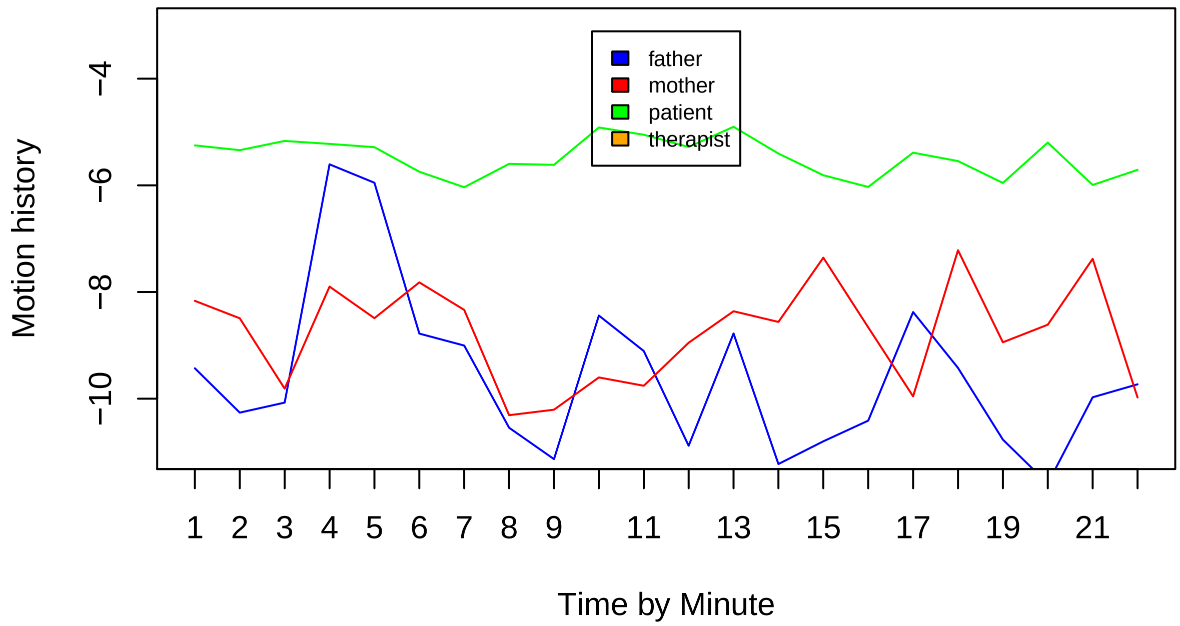
Mean motion history (non overlaping minute intervals) on F1044C1 video



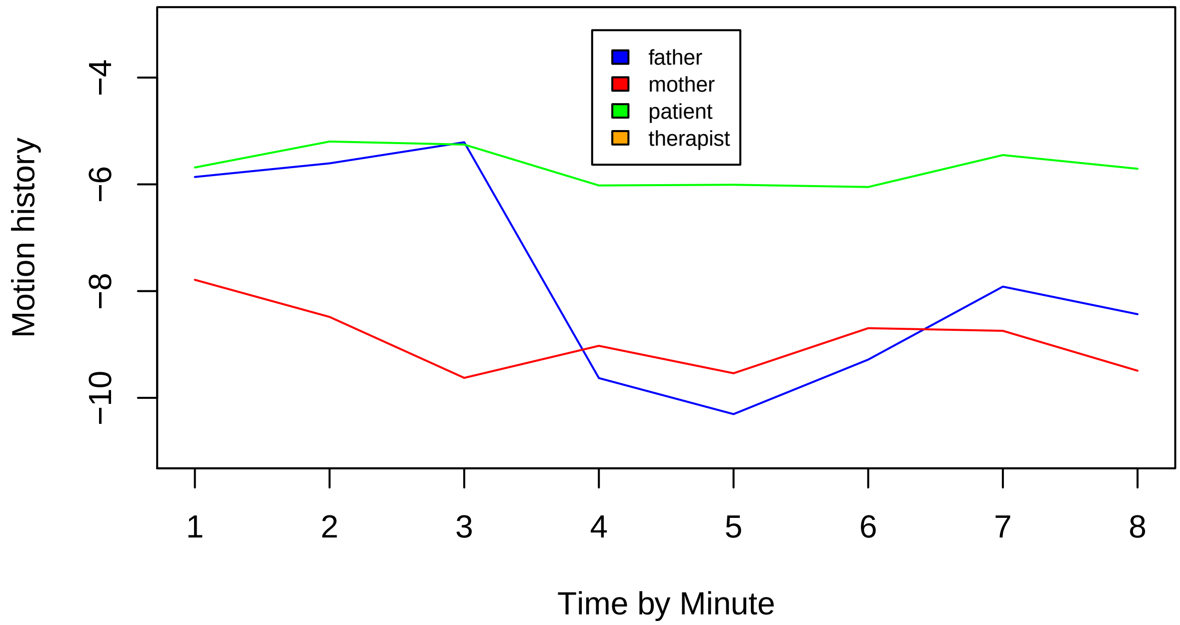
Mean motion history (non overlaping minute intervals) on F1044C2 video

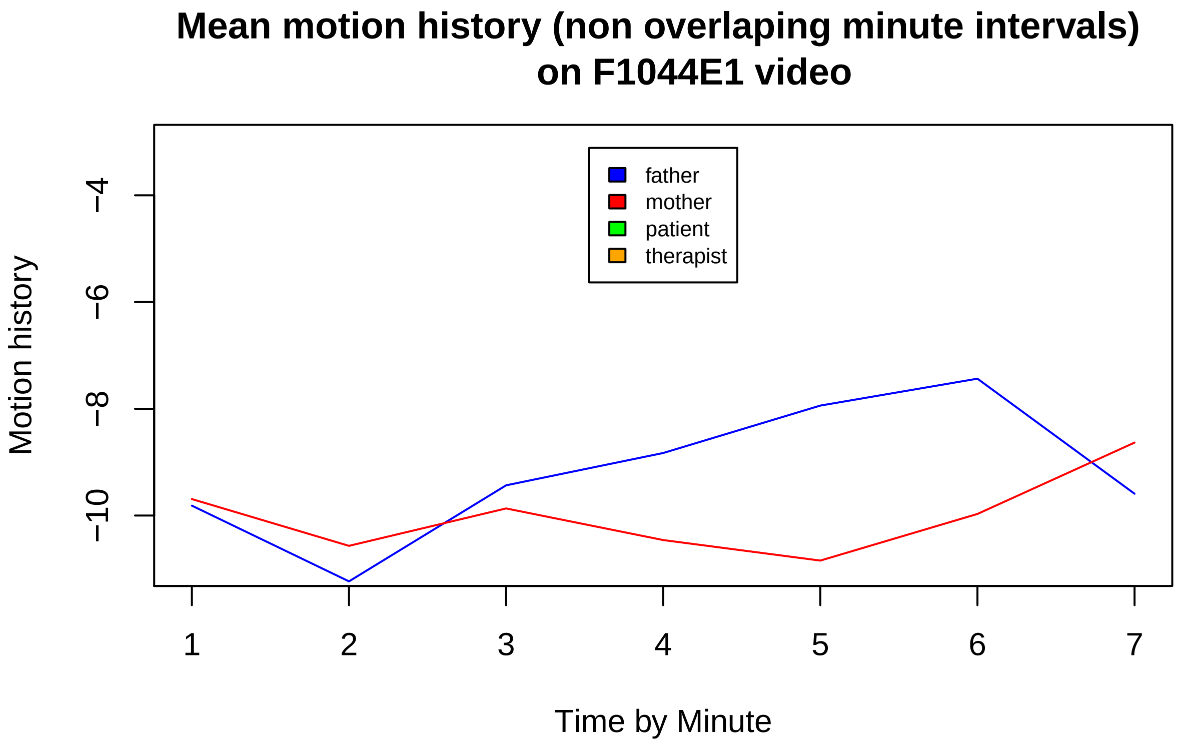


Mean motion history (non overlaping minute intervals) on F1044D1 video

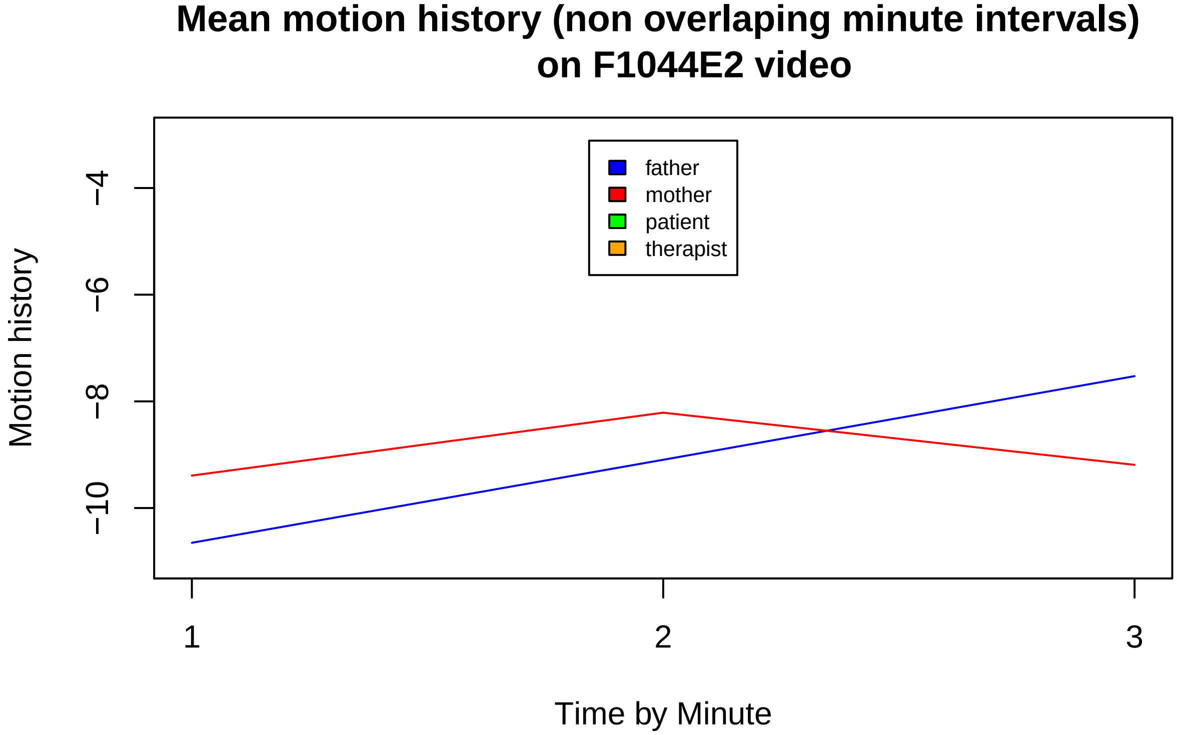


Mean motion history (non overlaping minute intervals) on F1044D2 video



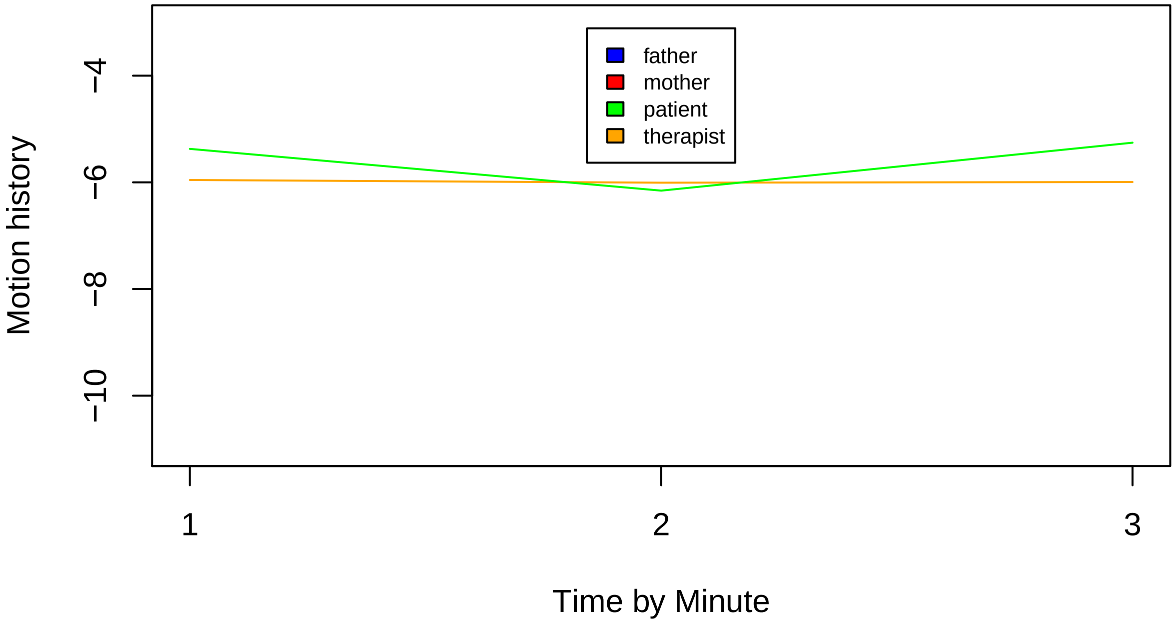


Mean motion history (non overlaping minute intervals) on F1044E1 video

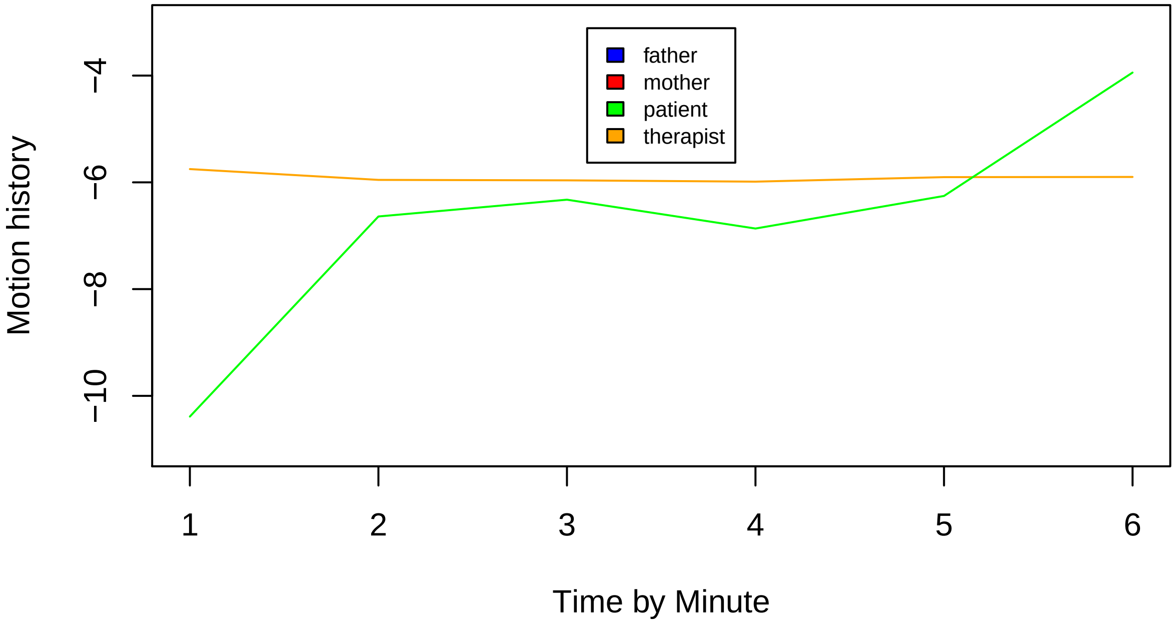


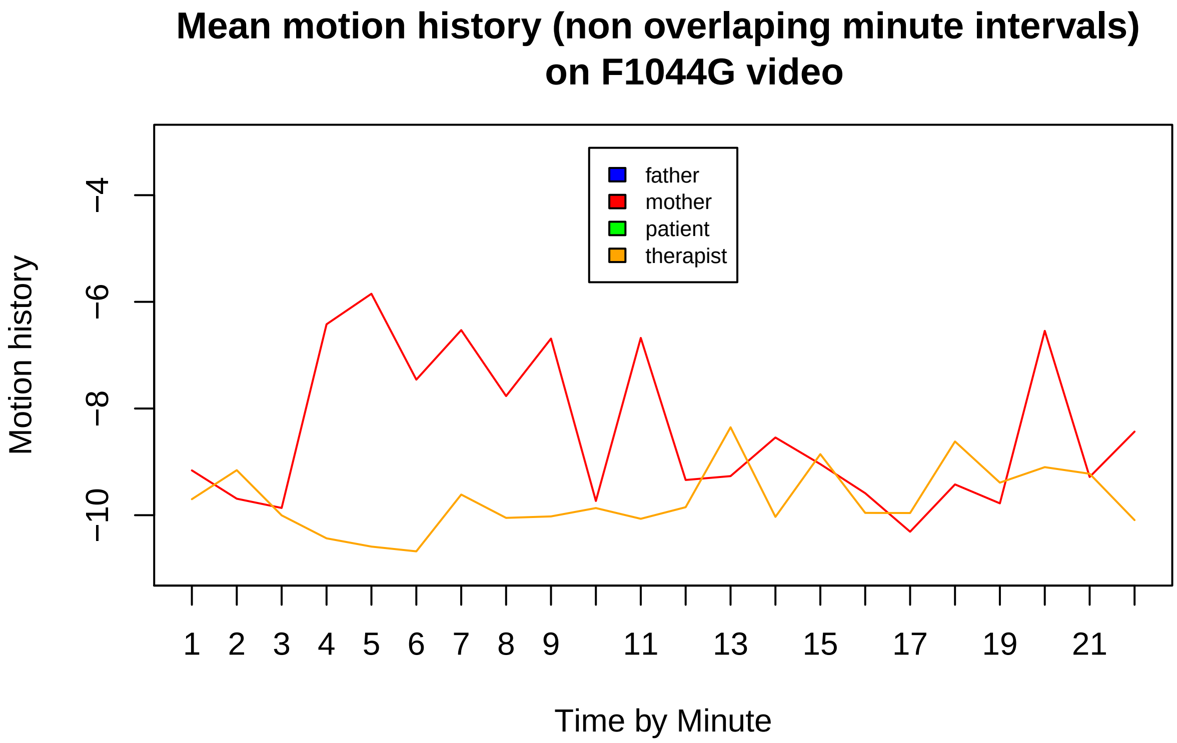
Mean motion history (non overlaping minute intervals) on F1044E2 video

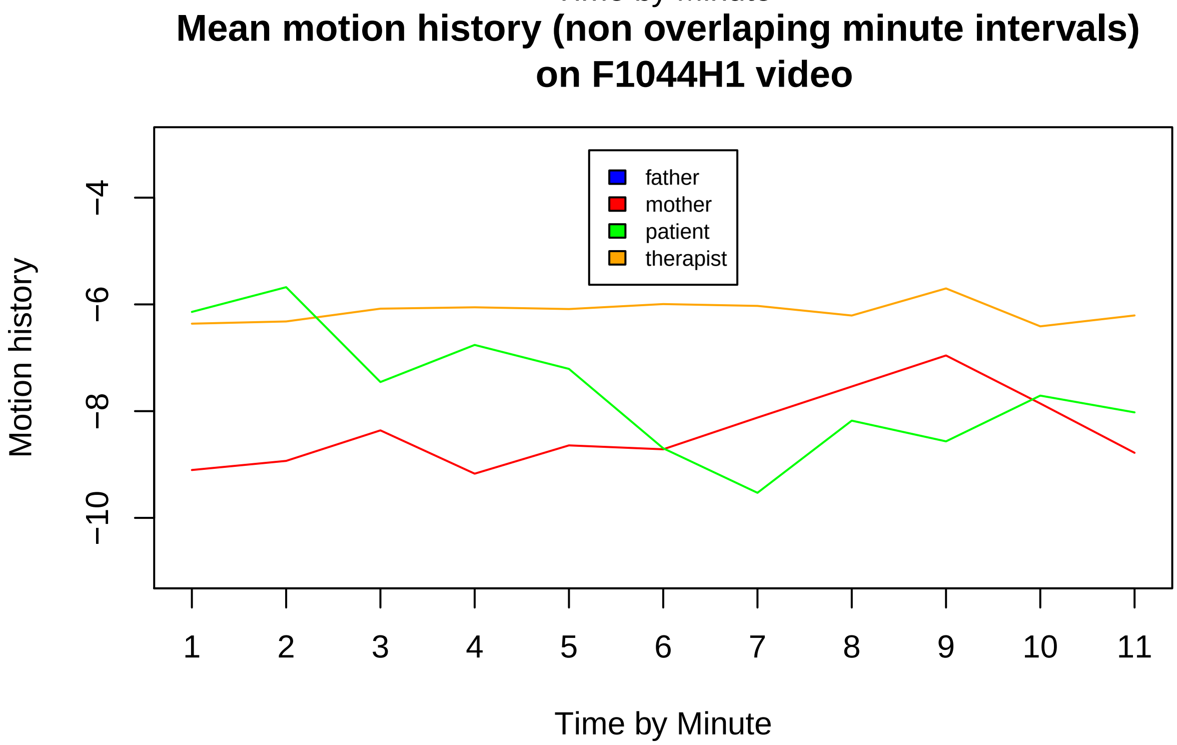
Mean motion history (non overlaping minute intervals) on F1044F1 video

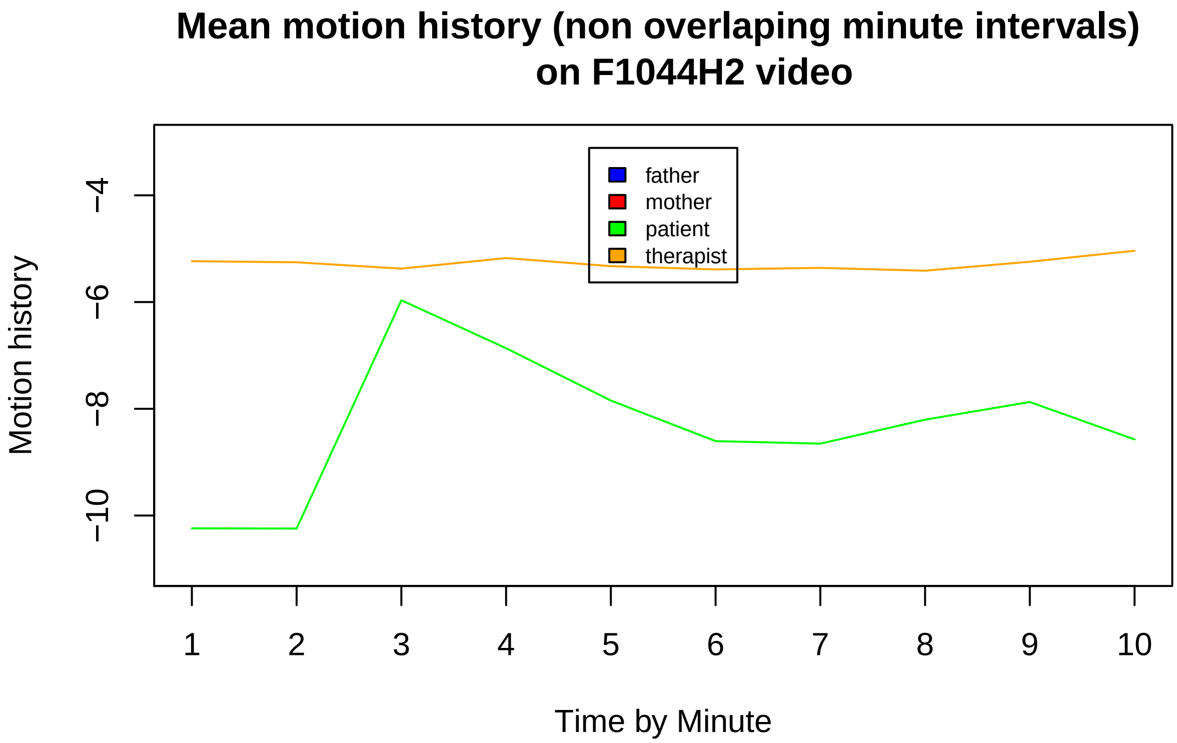


Mean motion history (non overlaping minute intervals) on F1044F2 video

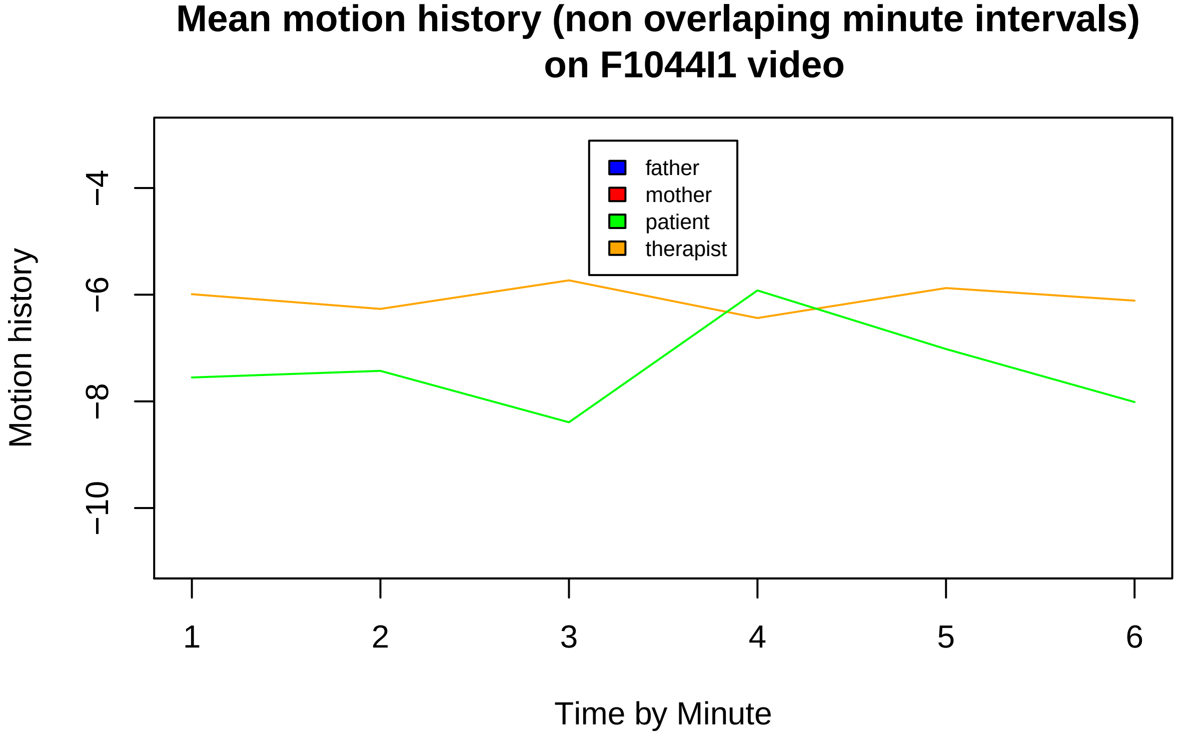



Mean motion history (non overlaping minute intervals)
on F1044G video
father
mother
patient
therapist
Motion history
−4
−6
−8
−10
1
2
3
4
5
6
7
8
9
11
13
15
17
19
21
Time by Minute

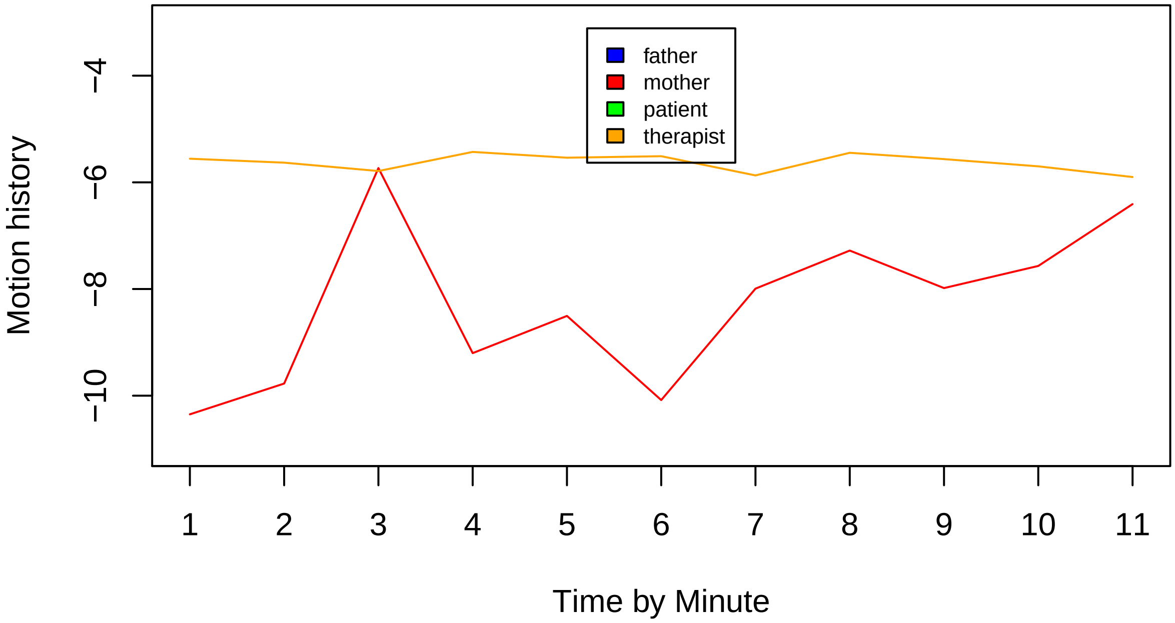

Mean motion history (non overlaping minute intervals)
on F1044H1 video
father
mother
patient
therapist
Motion history
−4
−6
−8
−10
1
2
3
4
5
6
7
8
9
10
11
Time by Minute



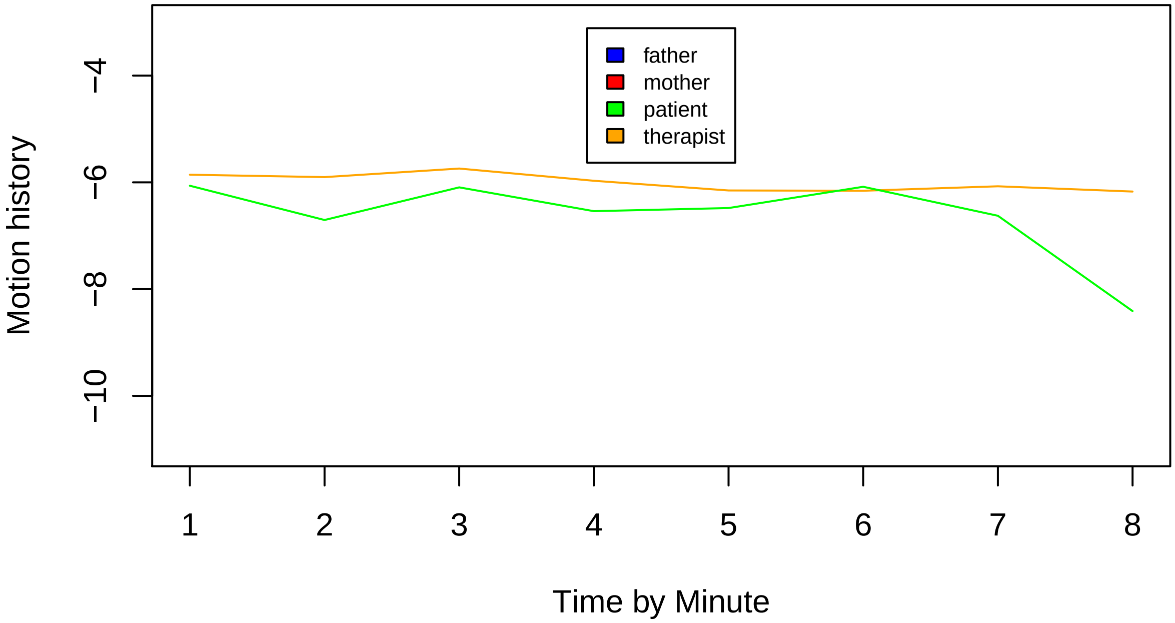
Mean motion history (non overlaping minute intervals) on F1044H2 video



Mean motion history (non overlaping minute intervals) on F1044I1 video

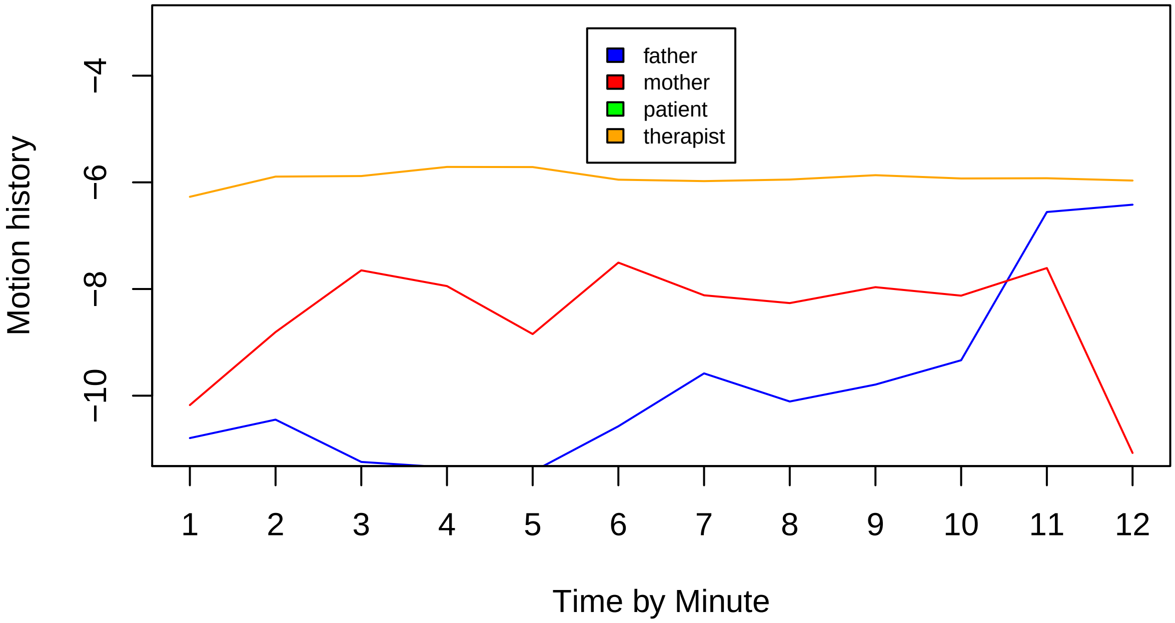


Mean motion history (non overlaping minute intervals) on F1044I2 video

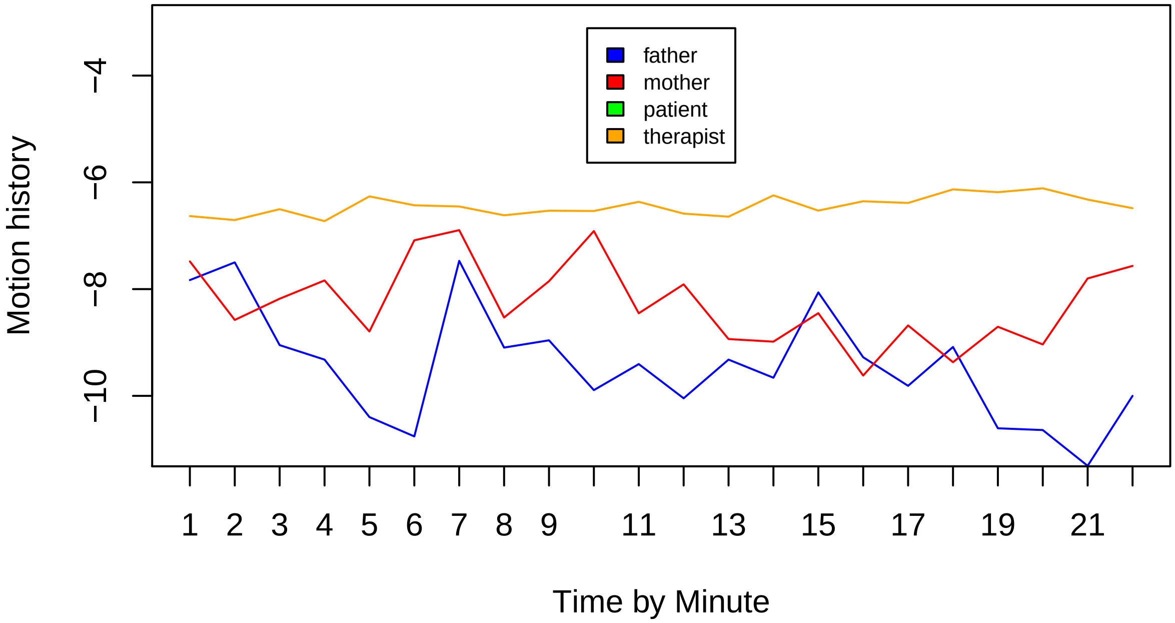


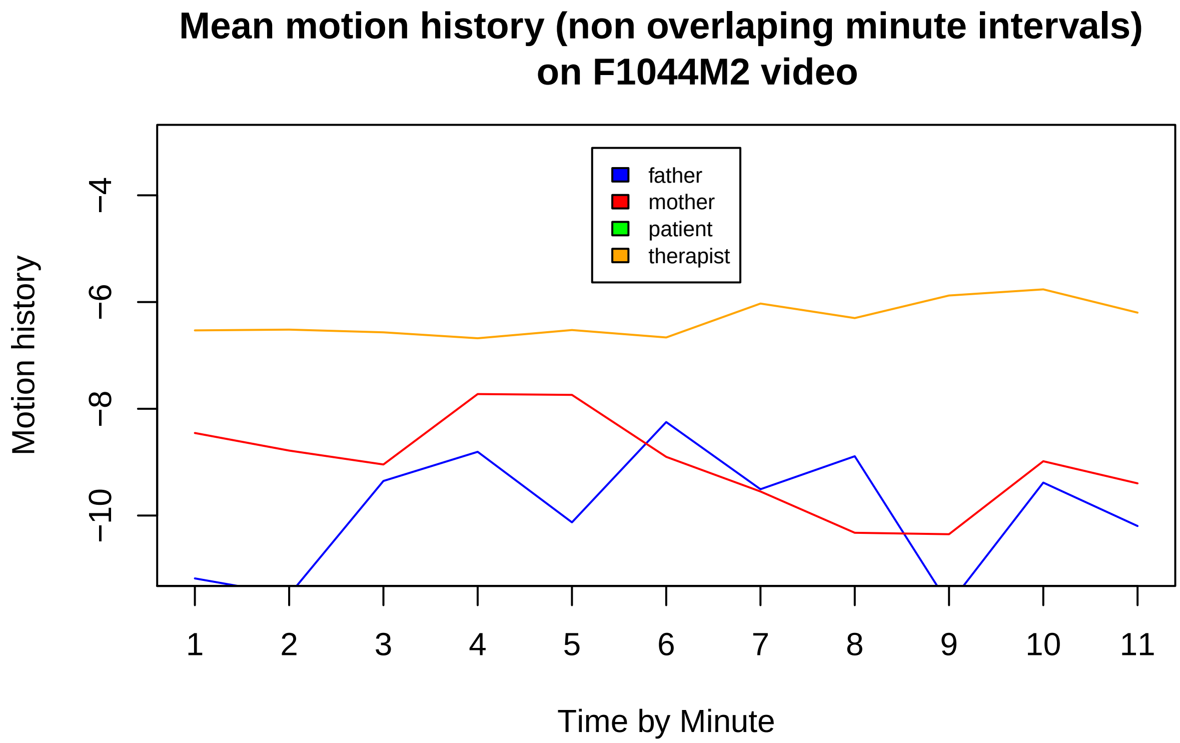
Mean motion history (non overlaping minute intervals) on F1044L1 video

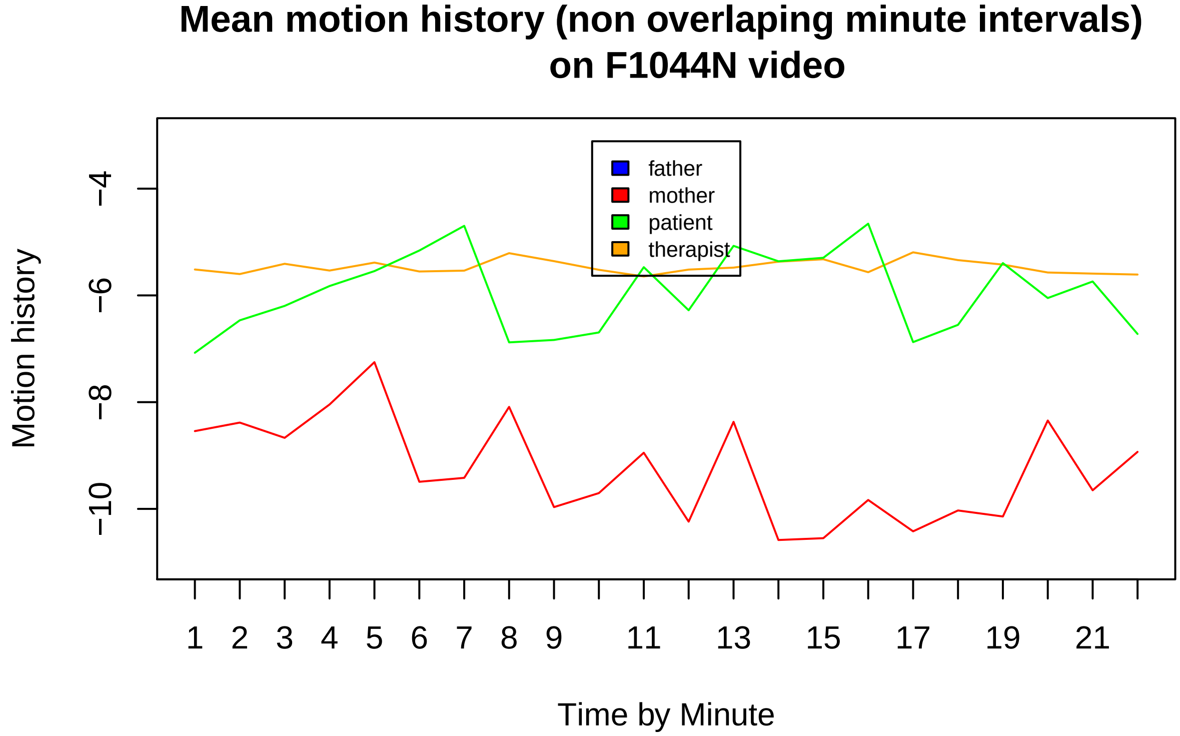
Mean motion history (non overlaping minute intervals) on F1044L2 video



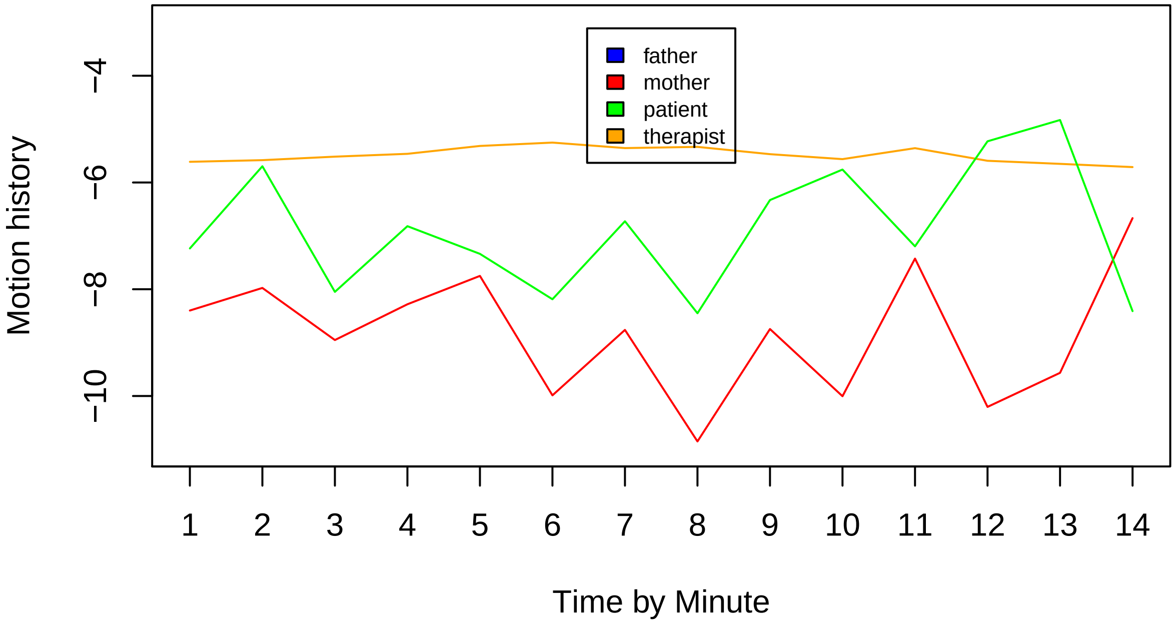
Mean motion history (non overlaping minute intervals) on F1044M1 video



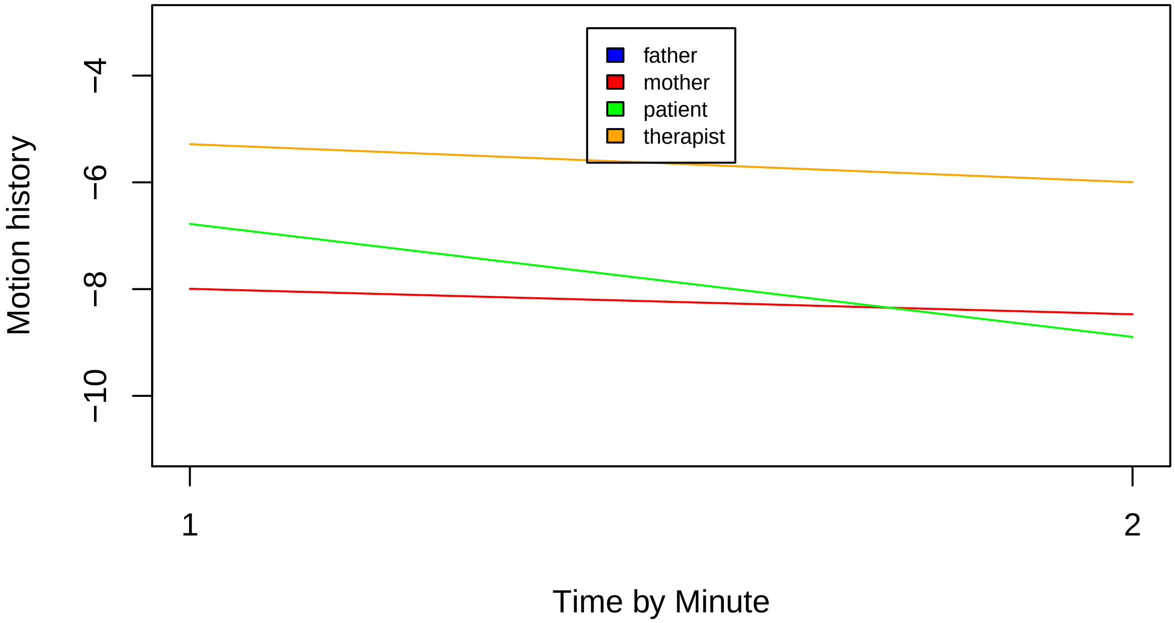

Mean motion history (non overlaping minute intervals) on F1044M2 video

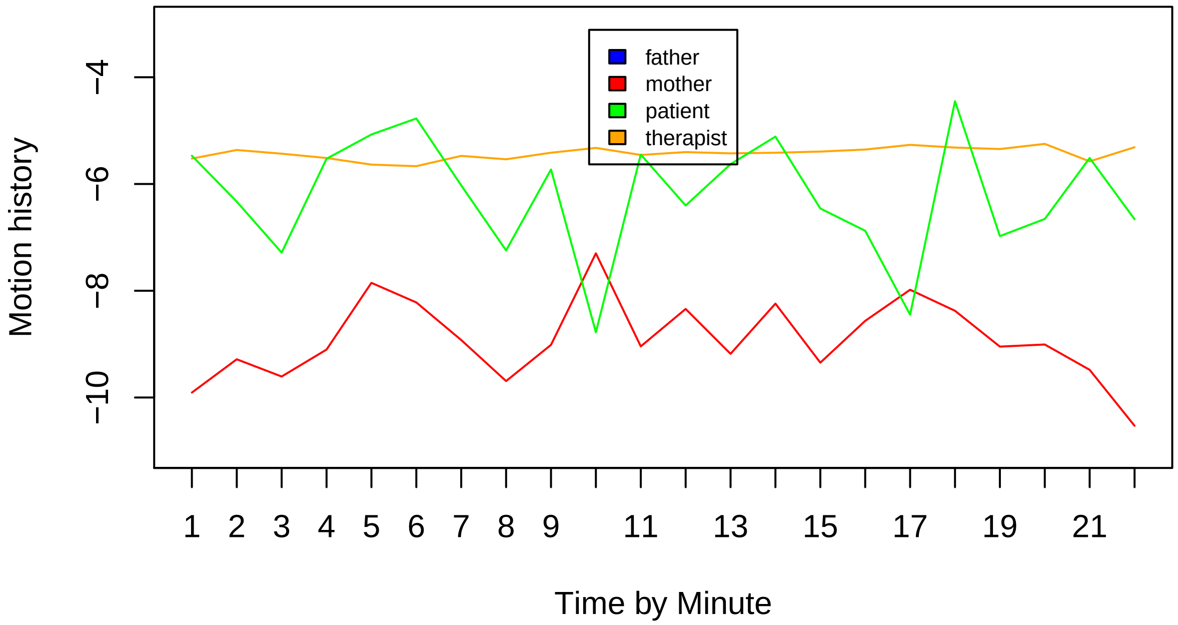

Mean motion history (non overlaping minute intervals) on F1044N video

Mean motion history (non overlaping minute intervals) on F1044O1 video

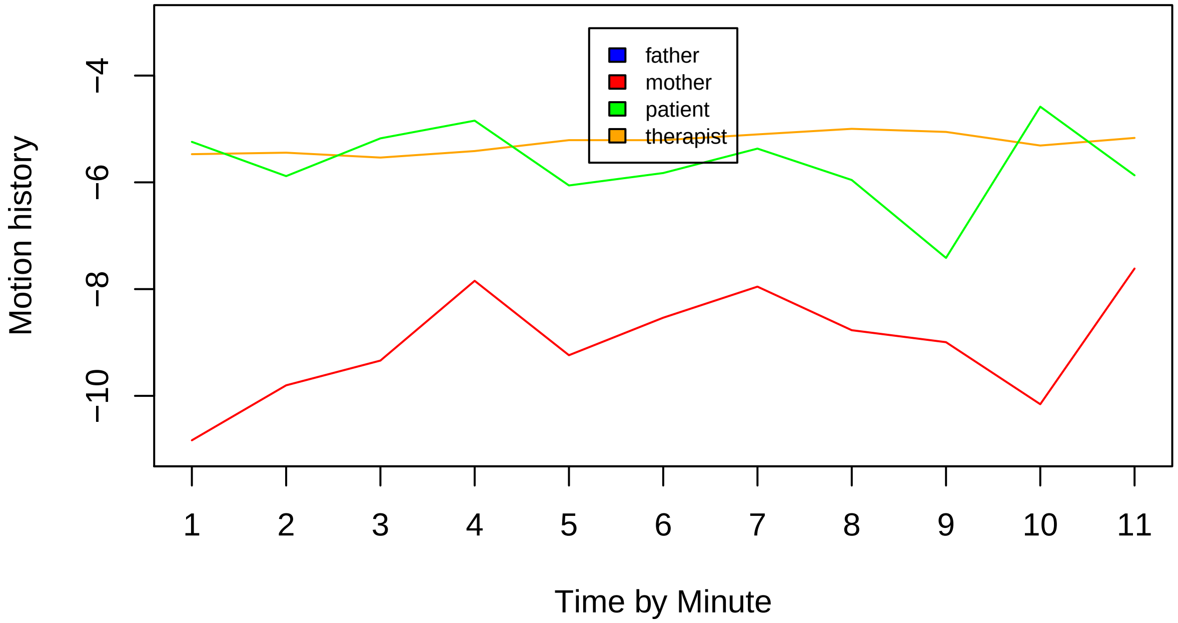


Mean motion history (non overlaping minute intervals) on F1044O2 video



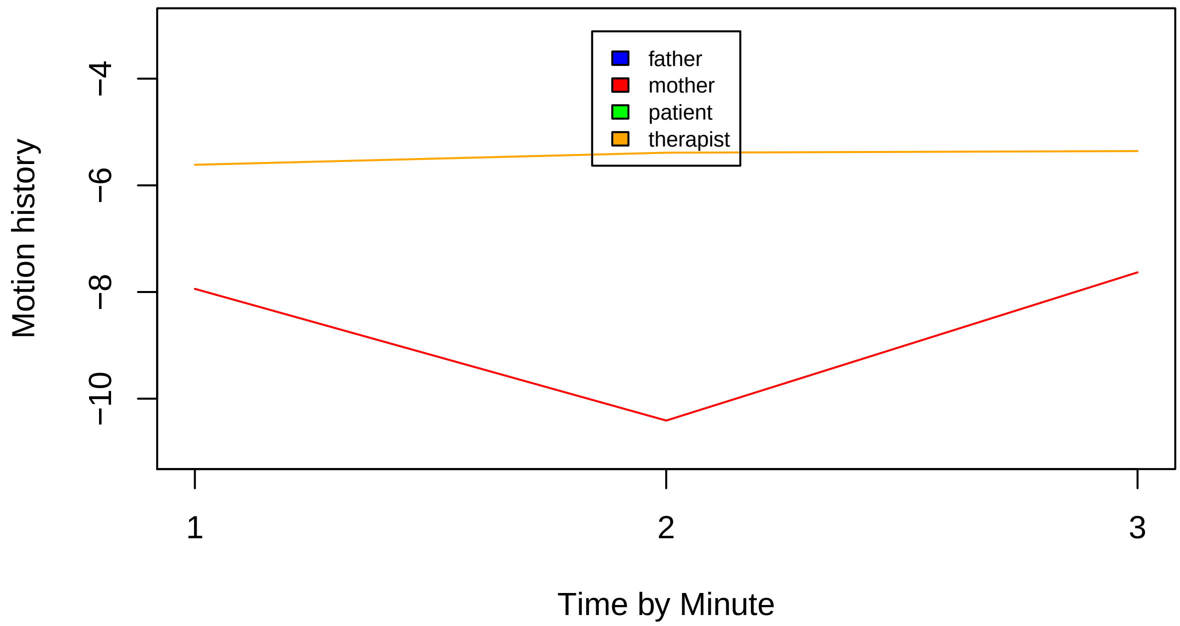


Mean motion history (non overlaping minute intervals) on F1044P video

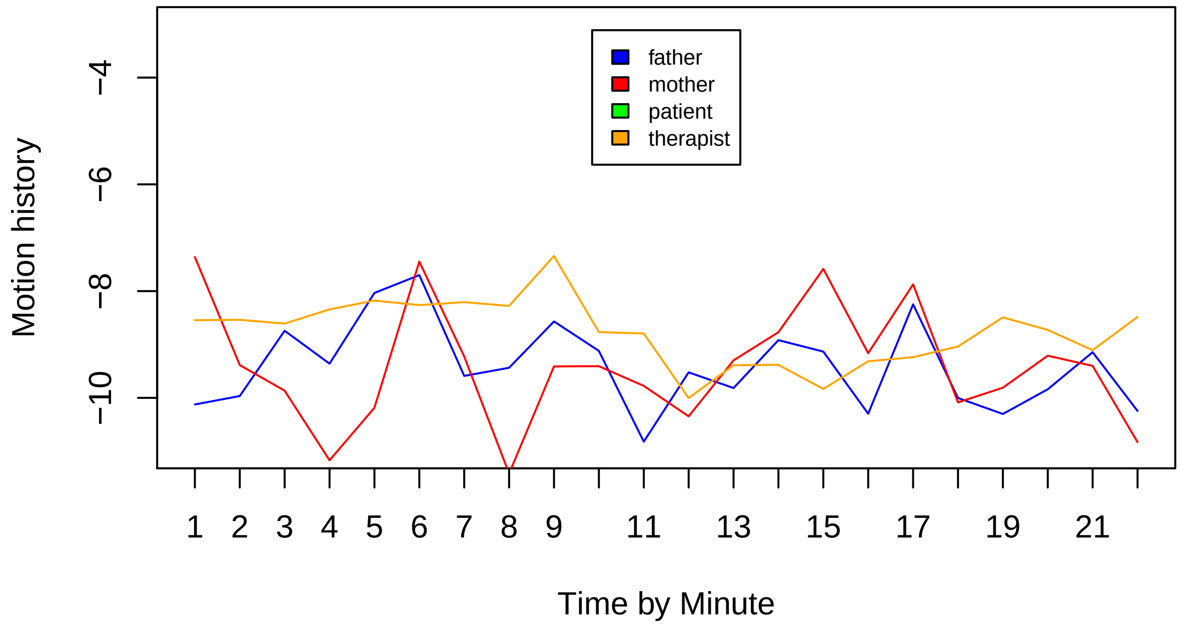


Mean motion history (non overlaping minute intervals) on F1044Q1 video

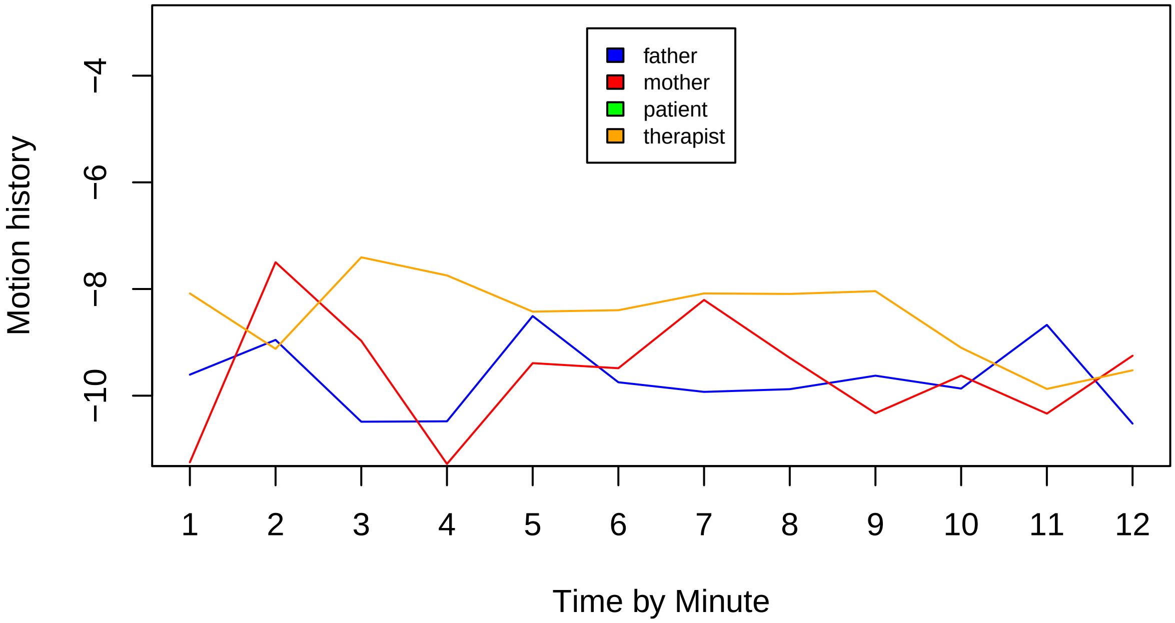
Mean motion history (non overlaping minute intervals) on F1044Q2 video



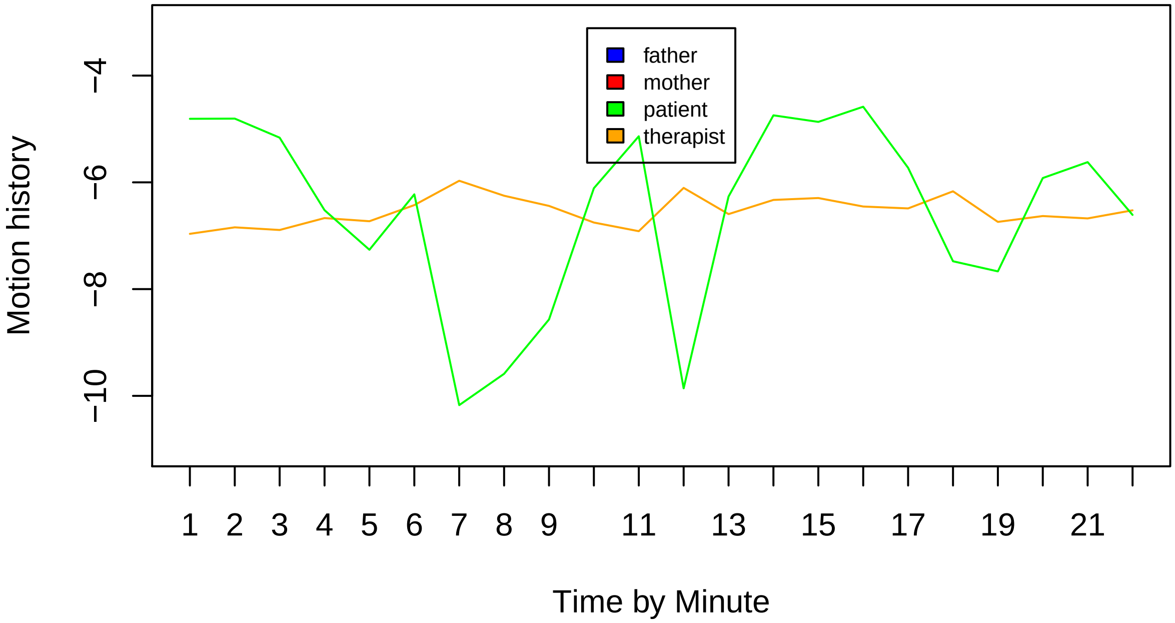
Mean motion history (non overlaping minute intervals) on F1044R1 video



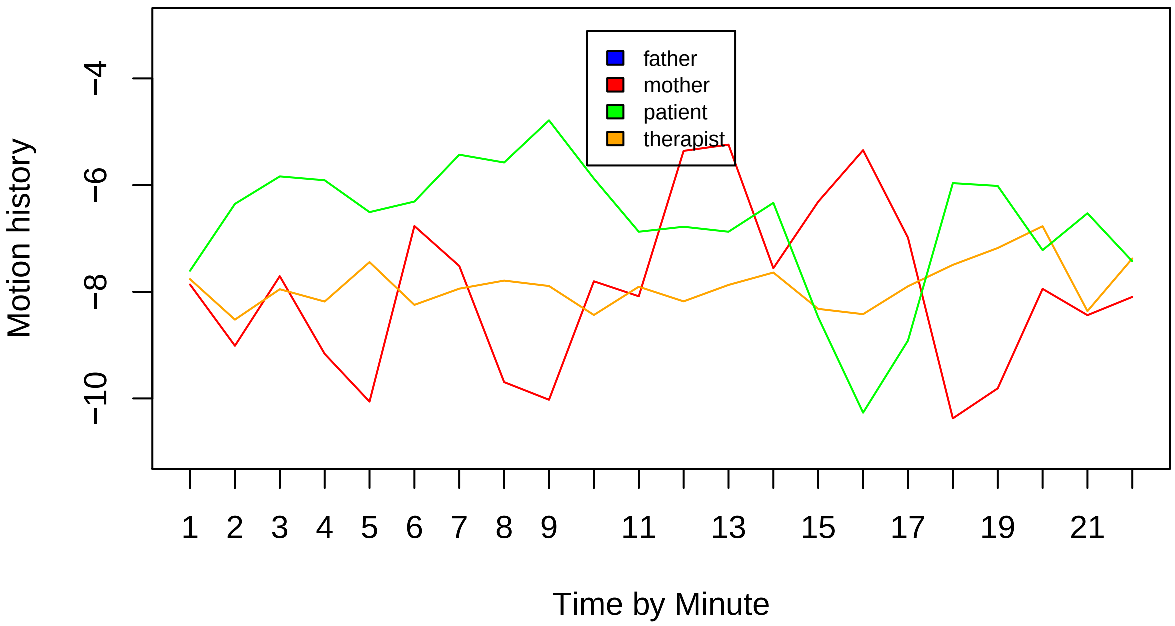
Mean motion history (non overlaping minute intervals) on F1044R2 video



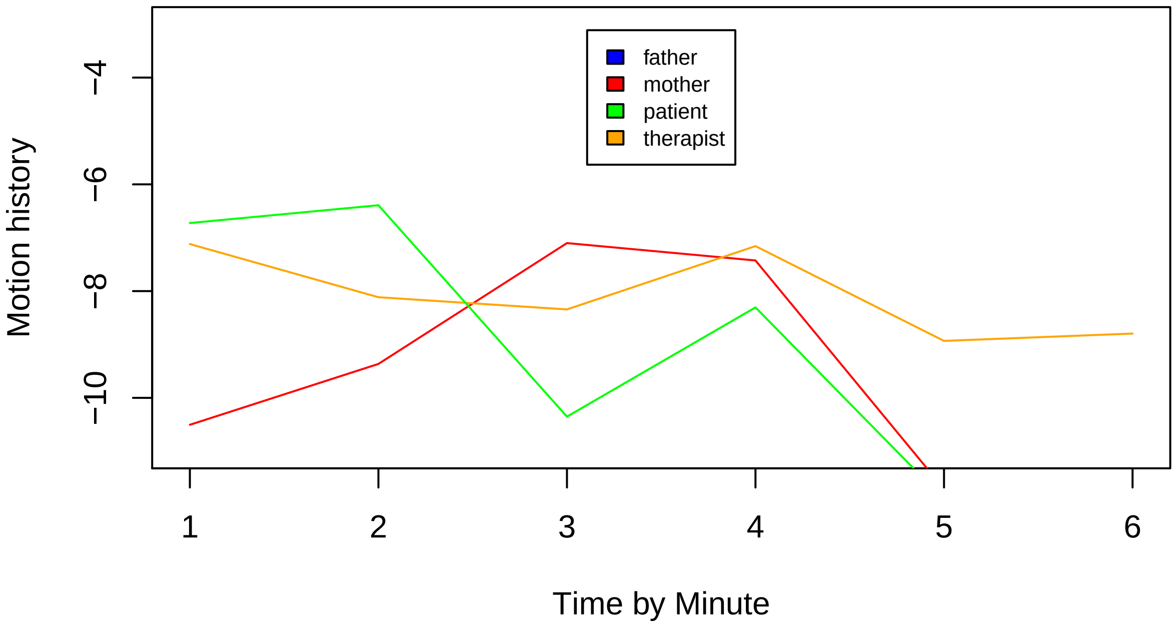
Mean motion history (non overlaping minute intervals) on F1044A1 video

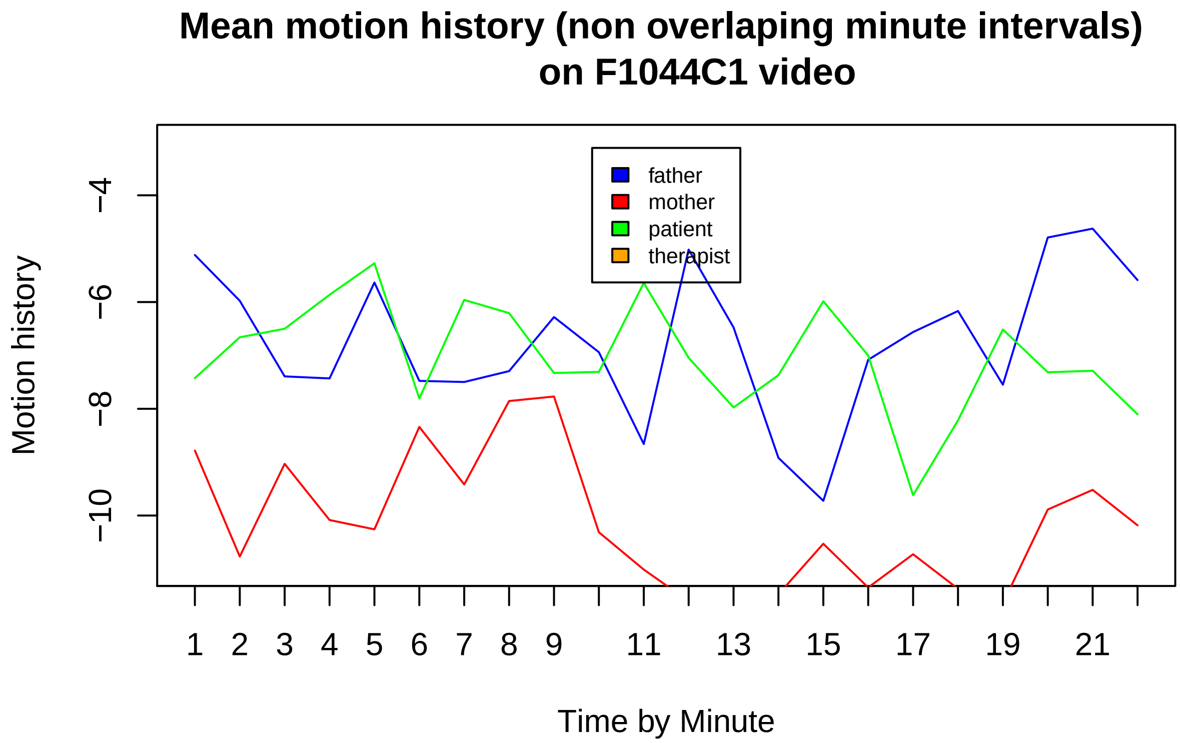


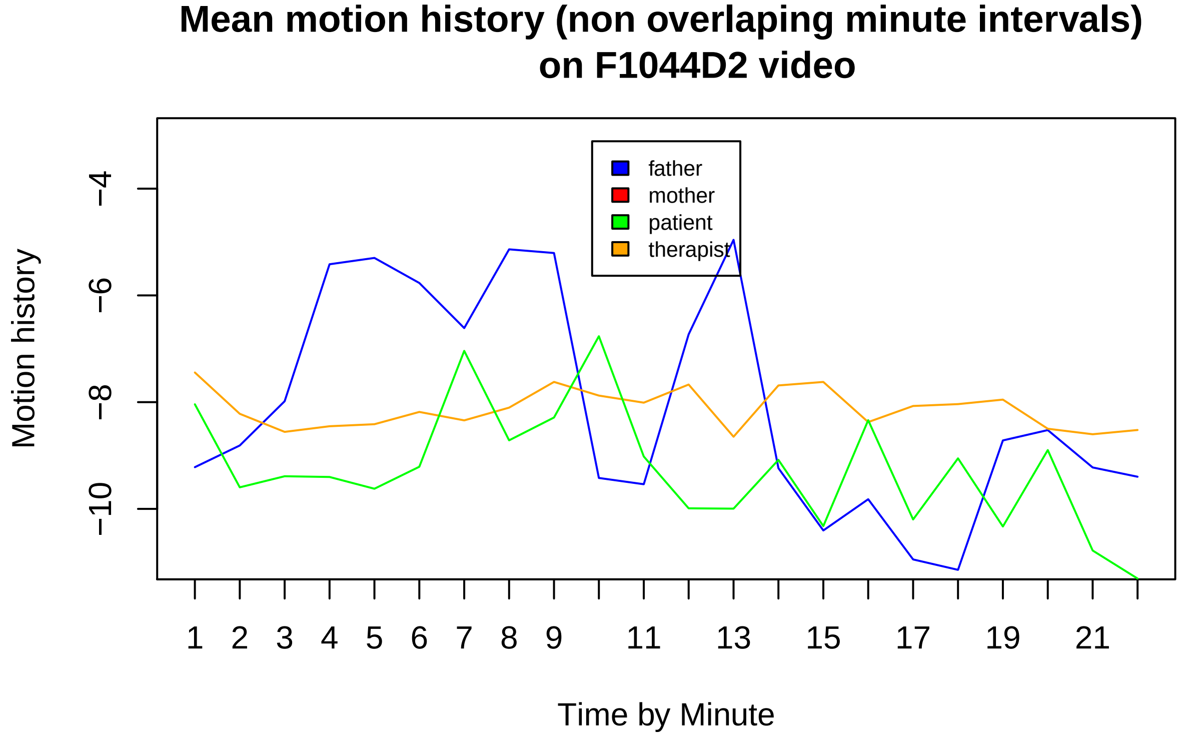
Mean motion history (non overlaping minute intervals) on F1044B1 video

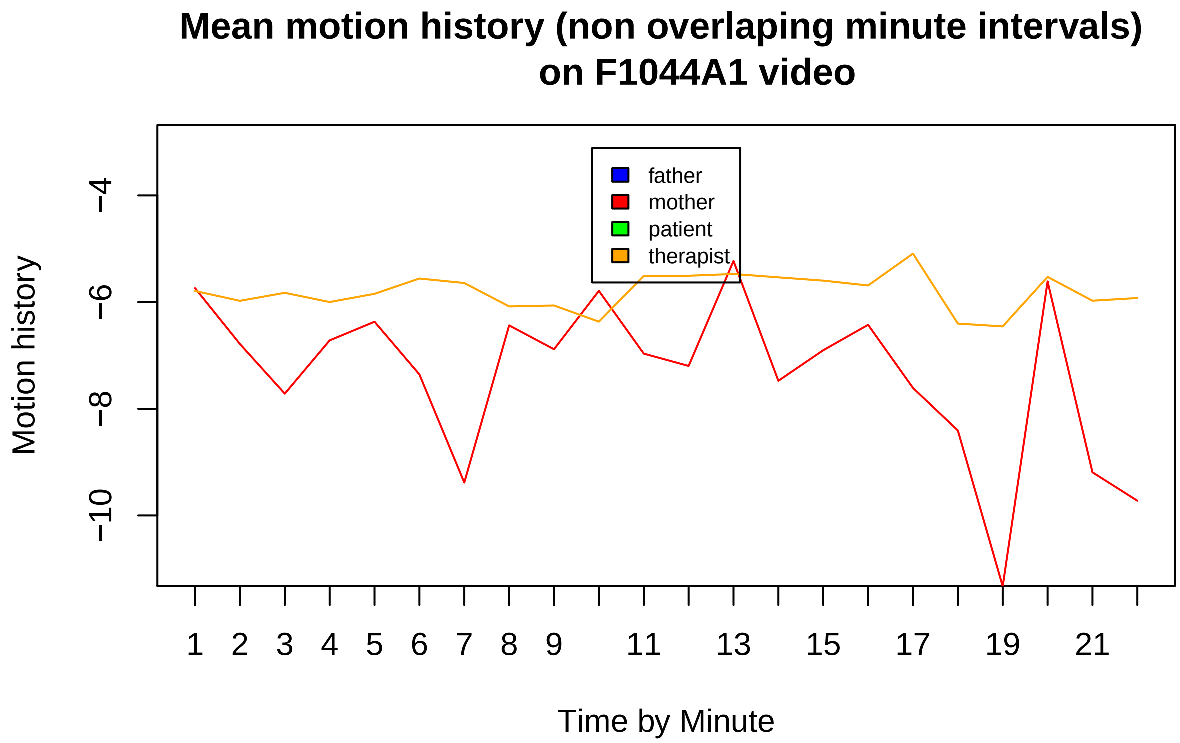


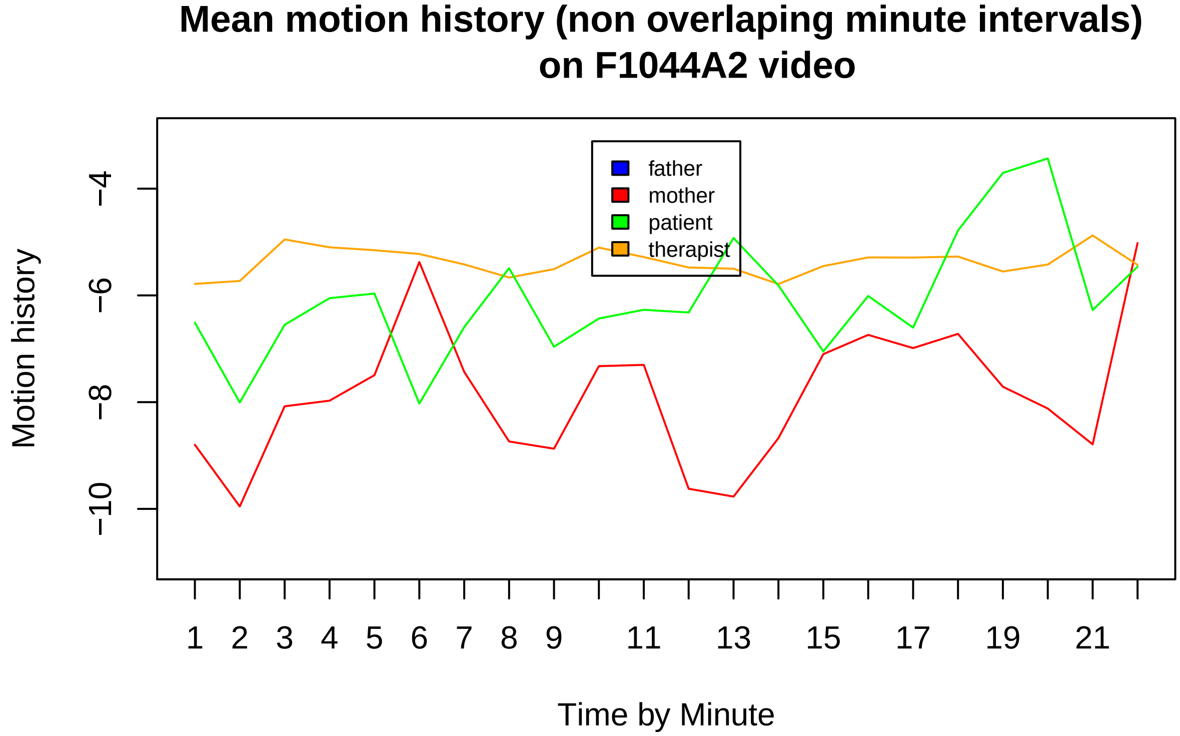
Mean motion history (non overlaping minute intervals) on F1044B2 video



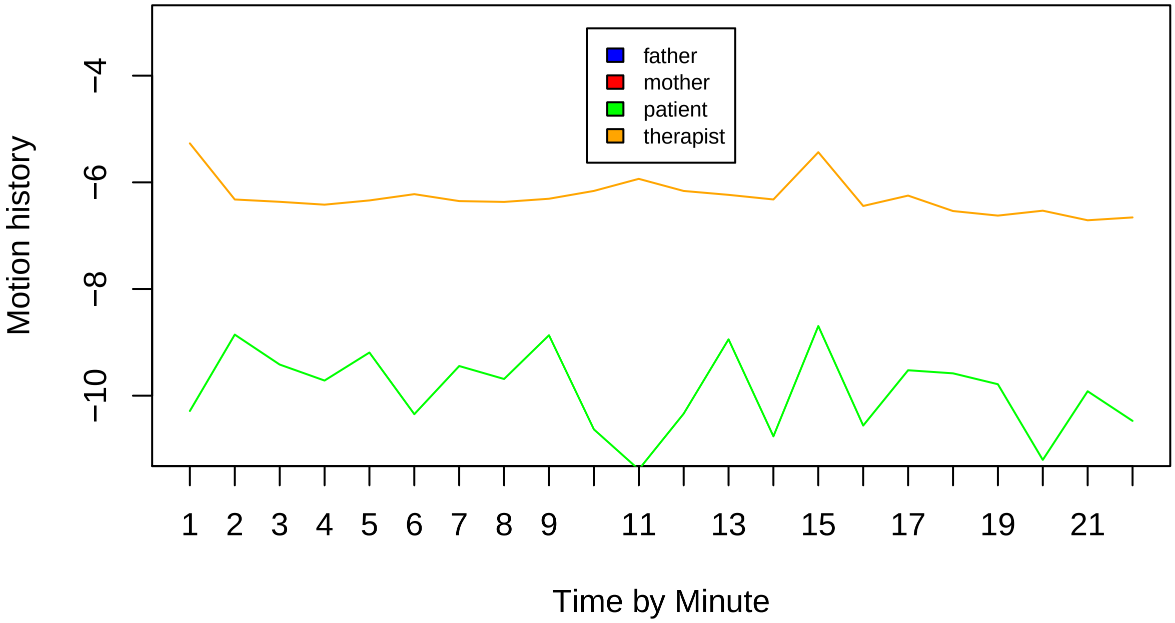

Mean motion history (non overlaping minute intervals)
on F1044C1 video
father
mother
patient
therapist
Motion history
−4
−6
−8
−10
1
2
3
4
5
6
7
8
9
11
13
15
17
19
21
Time by Minute


Mean motion history (non overlaping minute intervals)
on F1044D2 video
father
mother
patient
therapist
Motion history
−4
−6
−8
−10
1
2
3
4
5
6
7
8
9
11
13
15
17
19
21
Time by Minute

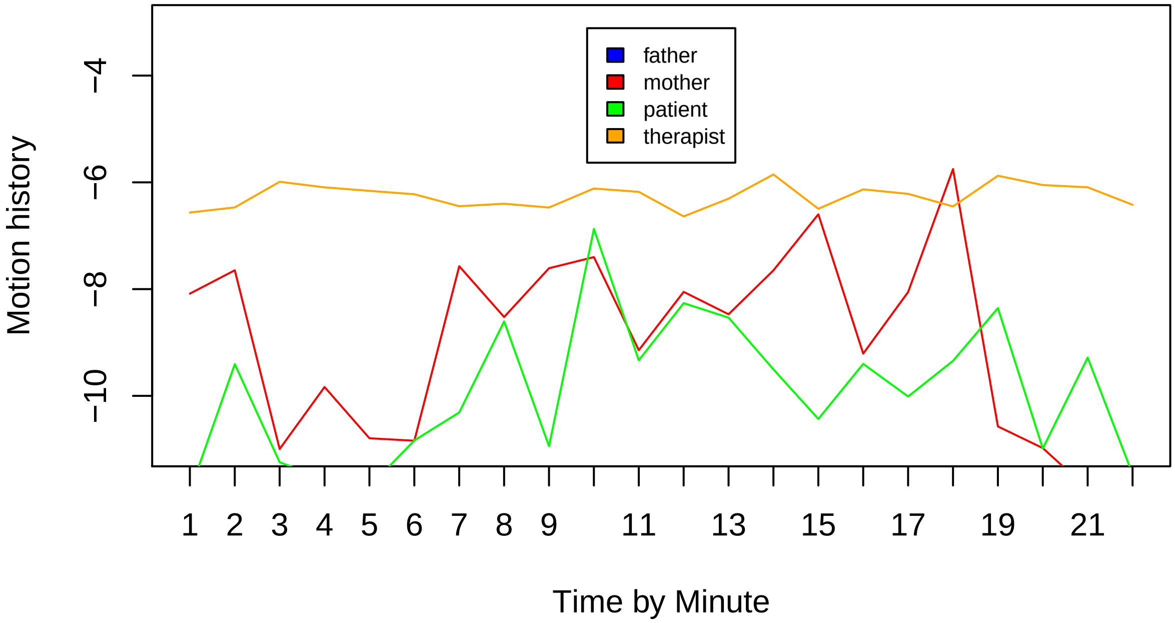

Mean motion history (non overlaping minute intervals)
on F1044A1 video
father
mother
patient
therapist
Motion history
−4
−6
−8
−10
1
2
3
4
5
6
7
8
9
11
13
15
17
19
21
Time by Minute

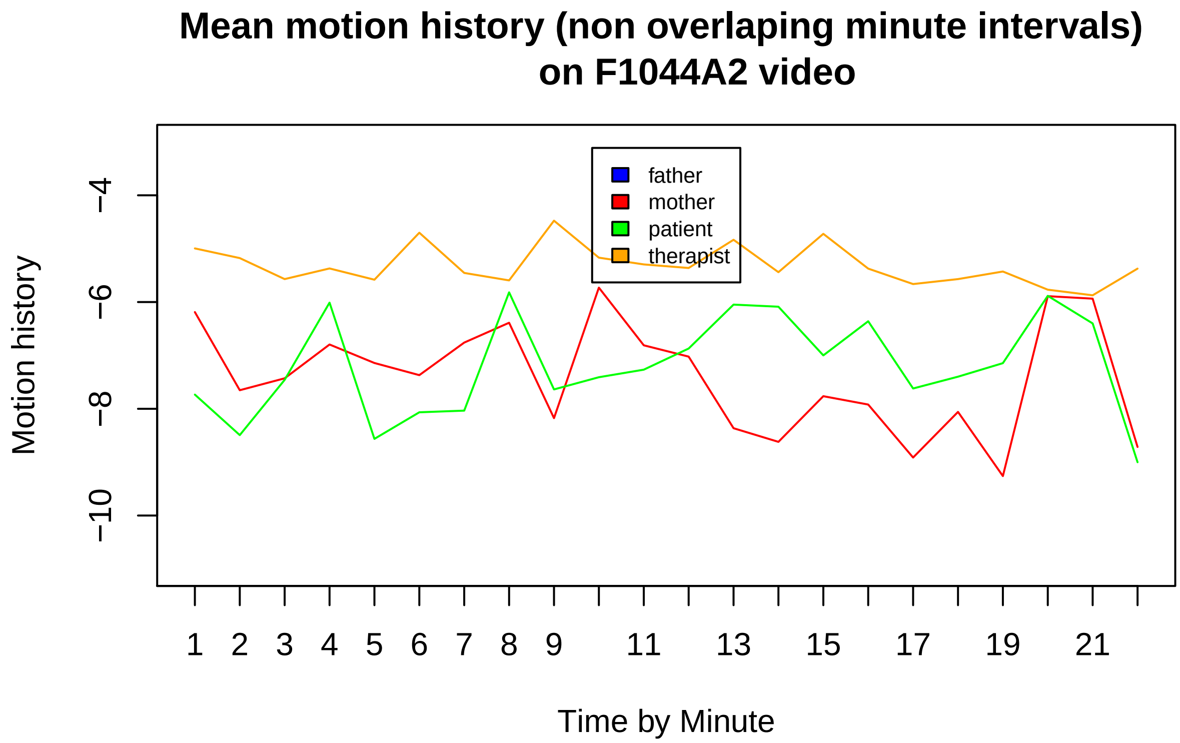

Mean motion history (non overlaping minute intervals)
on F1044A2 video
father
mother
patient
therapist
Motion history
−4
−6
−8
−10
1
2
3
4
5
6
7
8
9
11
13
15
17
19
21
Time by Minute

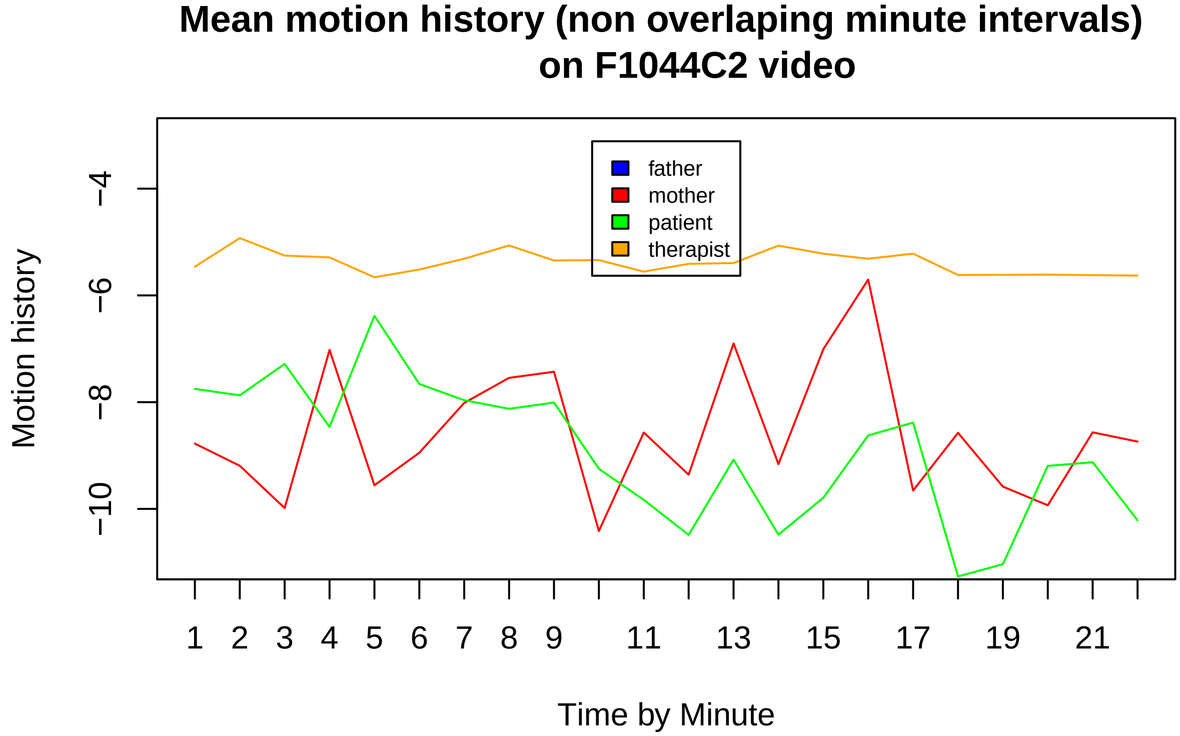
Mean motion history (non overlaping minute intervals) on F1044B1 video

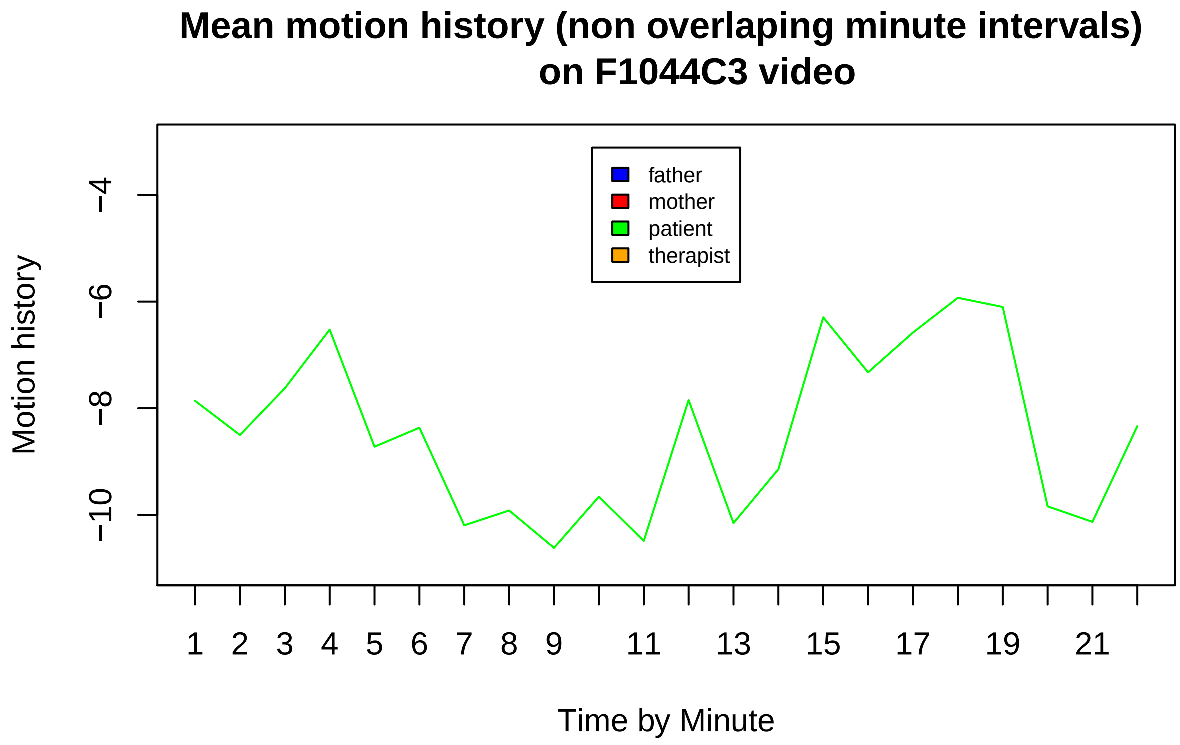


Mean motion history (non overlaping minute intervals) on F1044B2 video




Mean motion history (non overlaping minute intervals)
on F1044A2 video
father
mother
patient
therapist
Motion history
−4
−6
−8
−10
1
2
3
4
5
6
7
8
9
11
13
15
17
19
21
Time by Minute


Mean motion history (non overlaping minute intervals)
on F1044C2 video
father
mother
patient
therapist
Motion history
−4
−6
−8
−10
1
2
3
4
5
6
7
8
9
11
13
15
17
19
21
Time by Minute

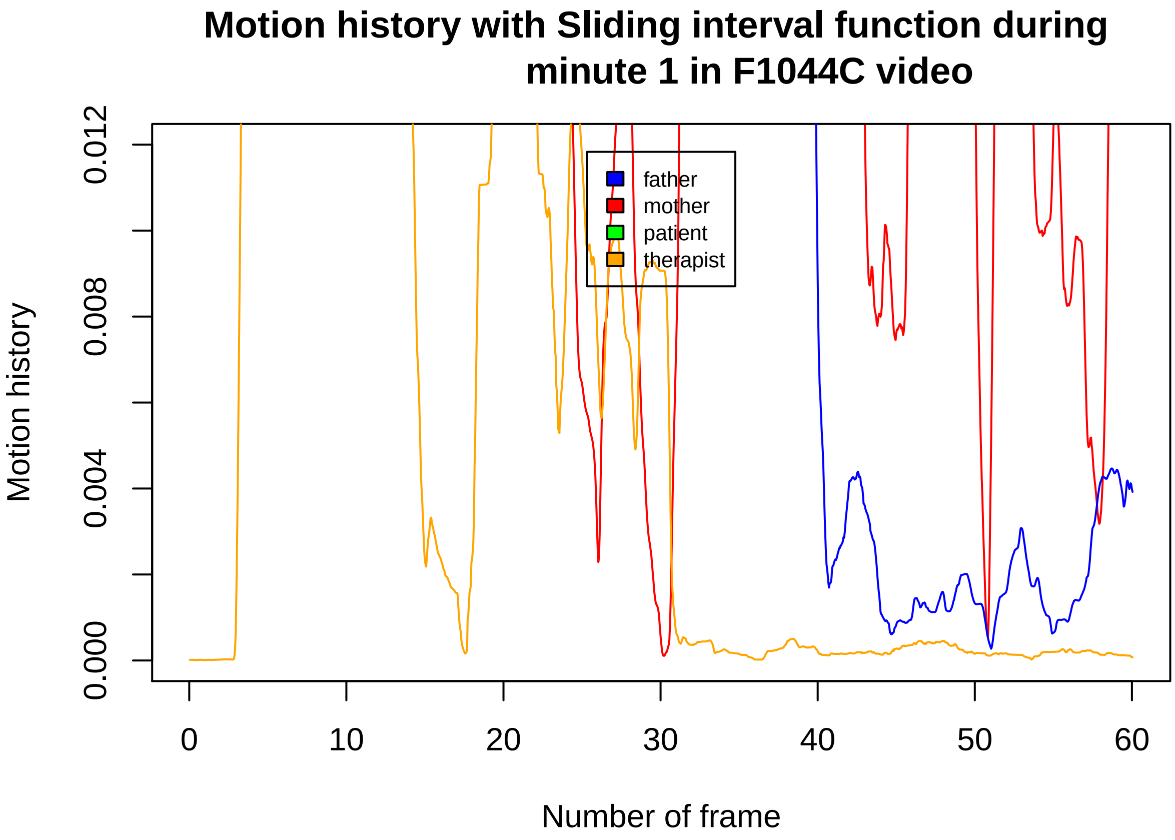


Motion history by minute for the F1044C video

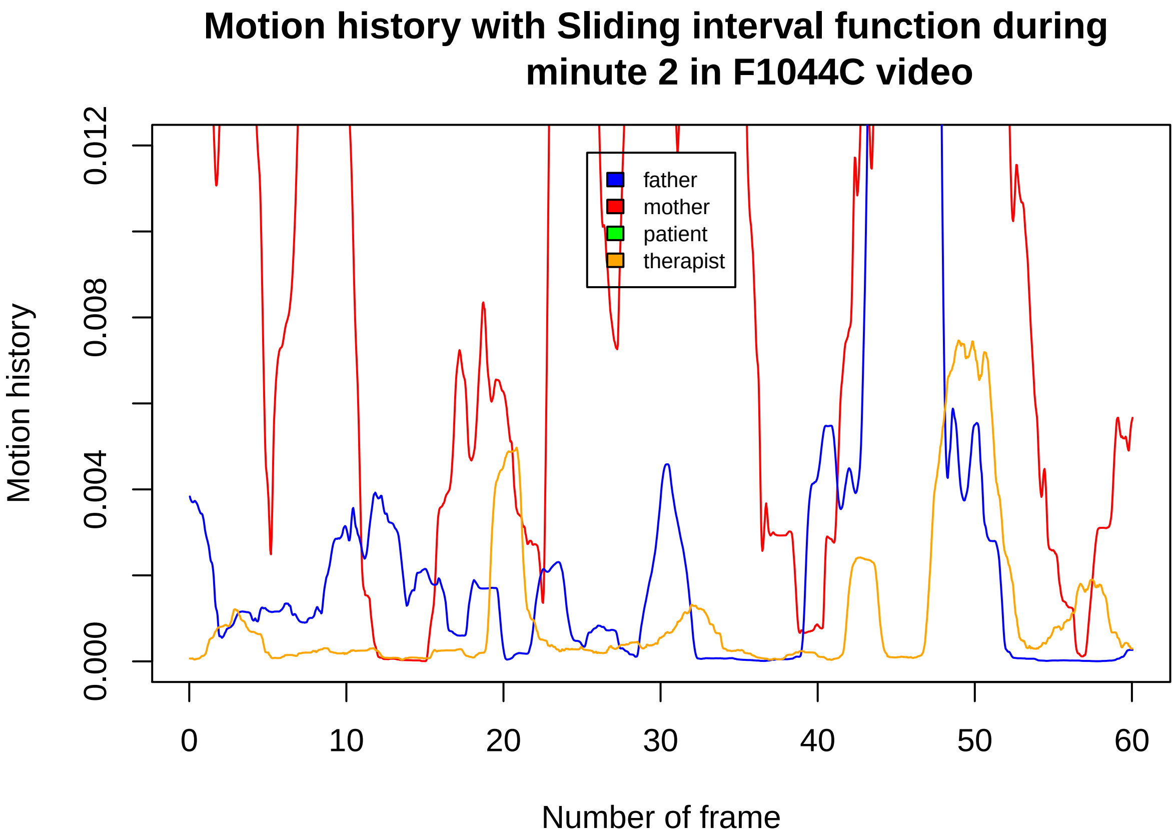
```
slidedFather <- SlidingInterval("father", 1 , 50, data)
slidedMother <- SlidingInterval("mother", 1 , 50, data)
slidedTherapist <- SlidingInterval("therapist", 1 , 50, data)
slidedPatient <- SlidingInterval("patient", 1 , 50, data)
```

```
framesByMinute <- 60*25
F1044C_Minutes <- ceiling(length(slidedFather)/framesByMinute)
for (i in 1:(F1044C_Minutes-1)){
      par(mar=c(4,4,4,2))
      borneInf <- i+framesByMinute*(i-1)
      borneSup <- i+i*framesByMinute
      slidedFatherMinute<-slidedFather[borneInf:borneSup]
      slidedMotherMinute<-slidedMother[borneInf:borneSup]
      slidedTherapistMinute<-slidedTherapist[borneInf:borneSup]
      slidedPatientMinute<-slidedPatient[borneInf:borneSup]
      slidedVideoDF <- data.frame(slidedFatherMinute, slidedMotherMinute, slidedTherapistMinute, slided
      str (slidedVideoDF)
      plot (slidedVideoDF$minute, slidedVideoDF$slidedMotherMinute, type="l", col="red",
      main=paste("Motion history with Sliding interval function during
                 minute ", i, " in F1044C video", sep=""),
      ylab="Motion history", xlab="Number of frame", ylim=c(0, 12E-03))
#     xaxp=c(0, length(slidedFatherMinute), length(slidedFatherMinute)))
      lines(slidedVideoDF$minute, slidedVideoDF$slidedFatherMinute, col="blue")
      lines(slidedVideoDF$minute, slidedVideoDF$slidedTherapistMinute, col="orange")
      lines(slidedVideoDF$minute, slidedVideoDF$slidedPatientMinute, col="green")
      legend("top", inset=.05, ParticipantsList,
            fill=colOrderList, cex=0.7)}
```

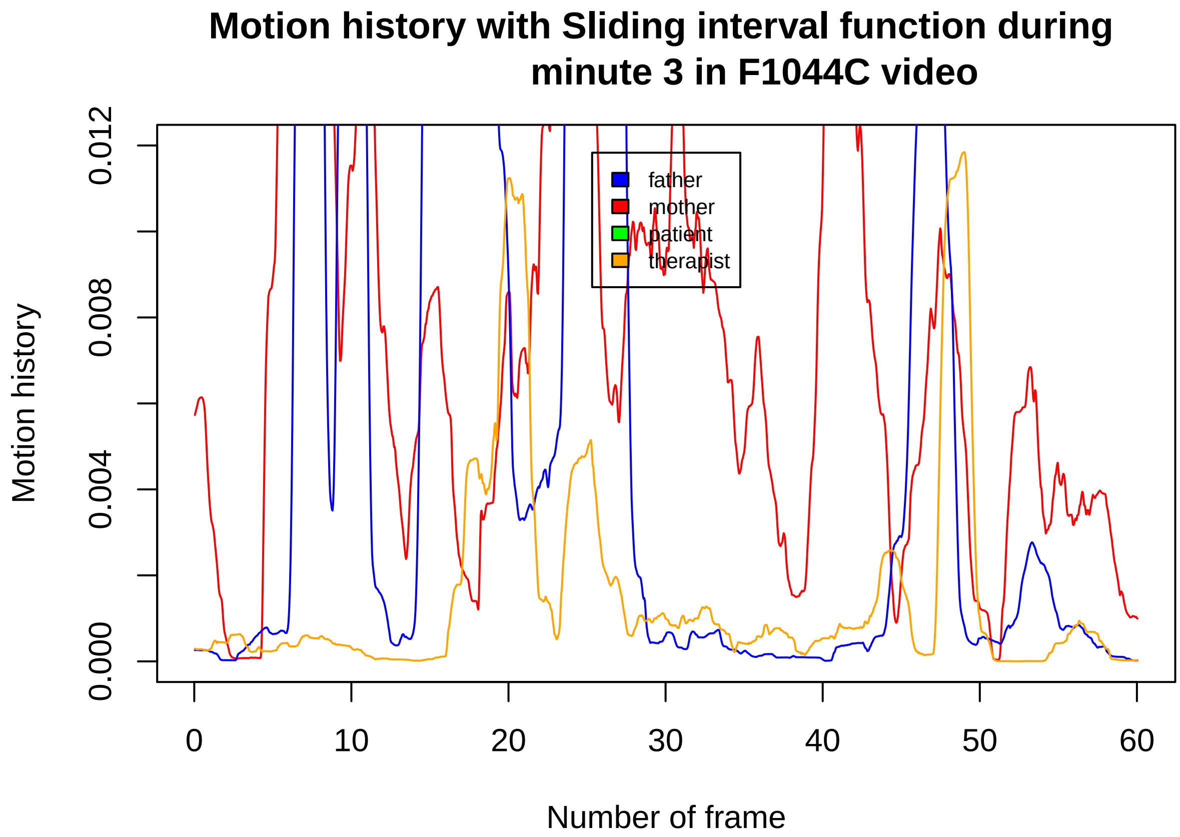
```
## 'data.frame':    1501 obs. of  6 variables:
##  $ slidedFatherMinute   : num  0.0239 0.0249 0.0258 0.0268 0.0277 ...
##  $ slidedMotherMinute   : num  0.0431 0.0418 0.0406 0.0397 0.039 ...
##  $ slidedTherapistMinute: num  1.61e-05 1.53e-05 1.53e-05 1.53e-05 1.44e-05 ...
##  $ slidedPatientMinute  : num  NaN NaN NaN NaN NaN NaN NaN NaN NaN NaN ...
##  $ frames               : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ minute               : num  0.04 0.08 0.12 0.16 0.2 0.24 0.28 0.32 0.36 0.4 ...
```



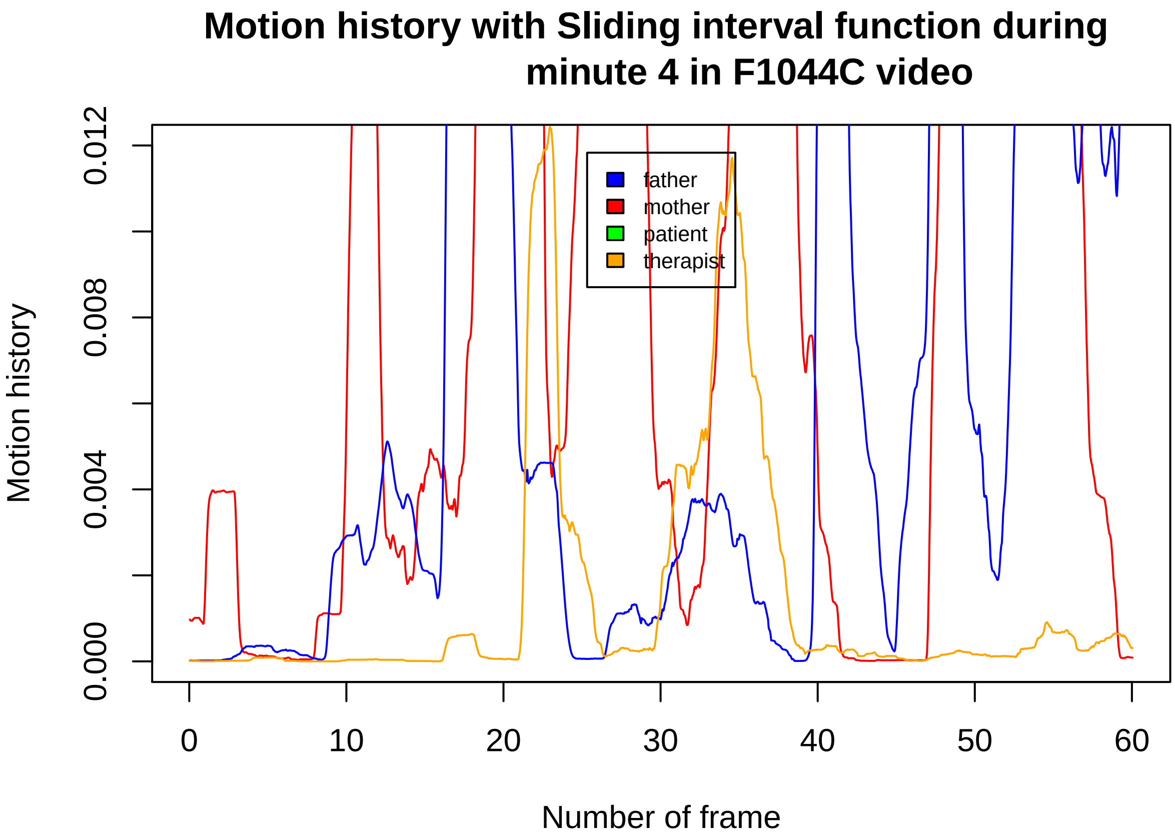
```
## 'data.frame':    1501 obs. of  6 variables:
##  $ slidedFatherMinute   : num  0.00384 0.00377 0.00374 0.00371 0.0037 ...
##  $ slidedMotherMinute   : num  0.0359 0.0356 0.0352 0.0346 0.0339 ...
##  $ slidedTherapistMinute: num  6.62e-05 6.54e-05 6.54e-05 6.54e-05 6.54e-05 ...
##  $ slidedPatientMinute  : num  NaN NaN NaN NaN NaN NaN NaN NaN NaN NaN ...
##  $ frames               : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ minute               : num  0.04 0.08 0.12 0.16 0.2 0.24 0.28 0.32 0.36 0.4 ...
```



```
## 'data.frame':    1501 obs. of  6 variables:
##  $ slidedFatherMinute   : num  0.000265 0.000264 0.000263 0.000263 0.000263 ...
##  $ slidedMotherMinute   : num  0.00573 0.00579 0.00585 0.0059 0.00597 ...
##  $ slidedTherapistMinute: num  0.000294 0.000291 0.000288 0.000278 0.000274 ...
##  $ slidedPatientMinute  : num  NaN NaN NaN NaN NaN NaN NaN NaN NaN NaN ...
##  $ frames               : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ minute               : num  0.04 0.08 0.12 0.16 0.2 0.24 0.28 0.32 0.36 0.4 ...
```

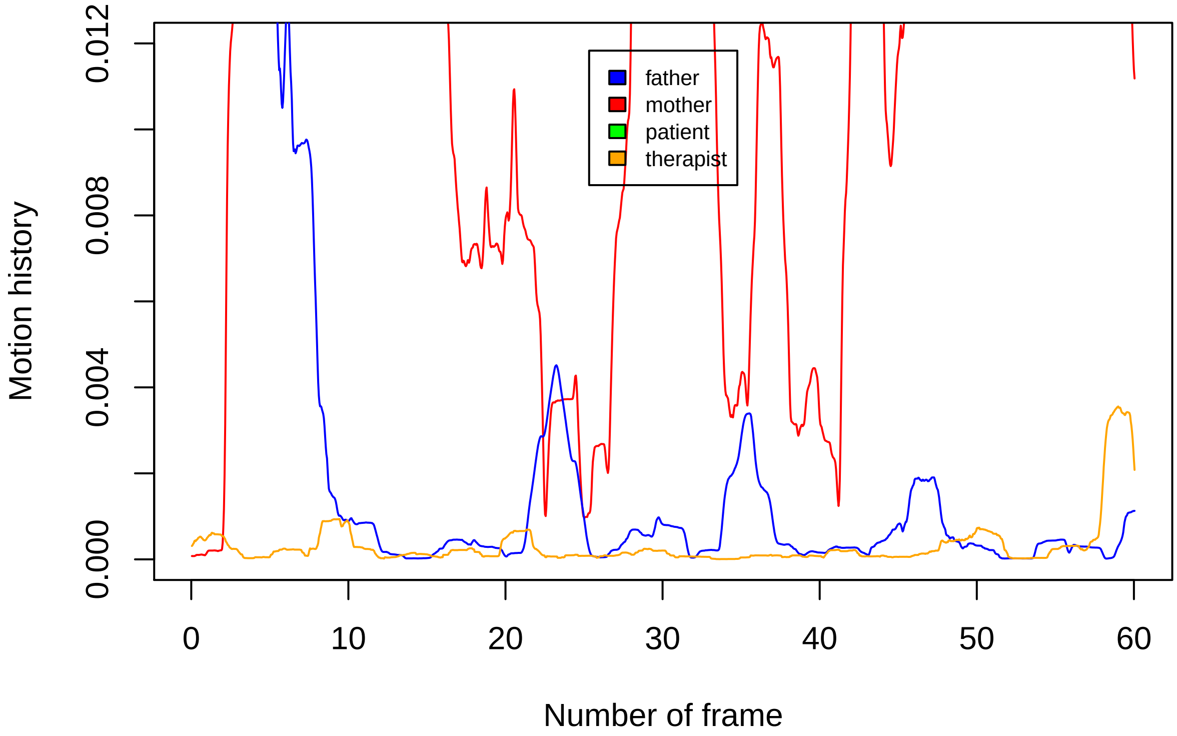


```
## 'data.frame':    1501 obs. of  6 variables:
##  $ slidedFatherMinute   : num  1.77e-05 1.71e-05 1.77e-05 1.77e-05 1.64e-05 ...
##  $ slidedMotherMinute   : num  0.000975 0.00095 0.000947 0.000947 0.000947 ...
##  $ slidedTherapistMinute: num  1.02e-05 1.02e-05 1.02e-05 9.34e-06 9.34e-06 ...
##  $ slidedPatientMinute  : num  NaN NaN NaN NaN NaN NaN NaN NaN NaN NaN ...
##  $ frames               : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ minute               : num  0.04 0.08 0.12 0.16 0.2 0.24 0.28 0.32 0.36 0.4 ...
```

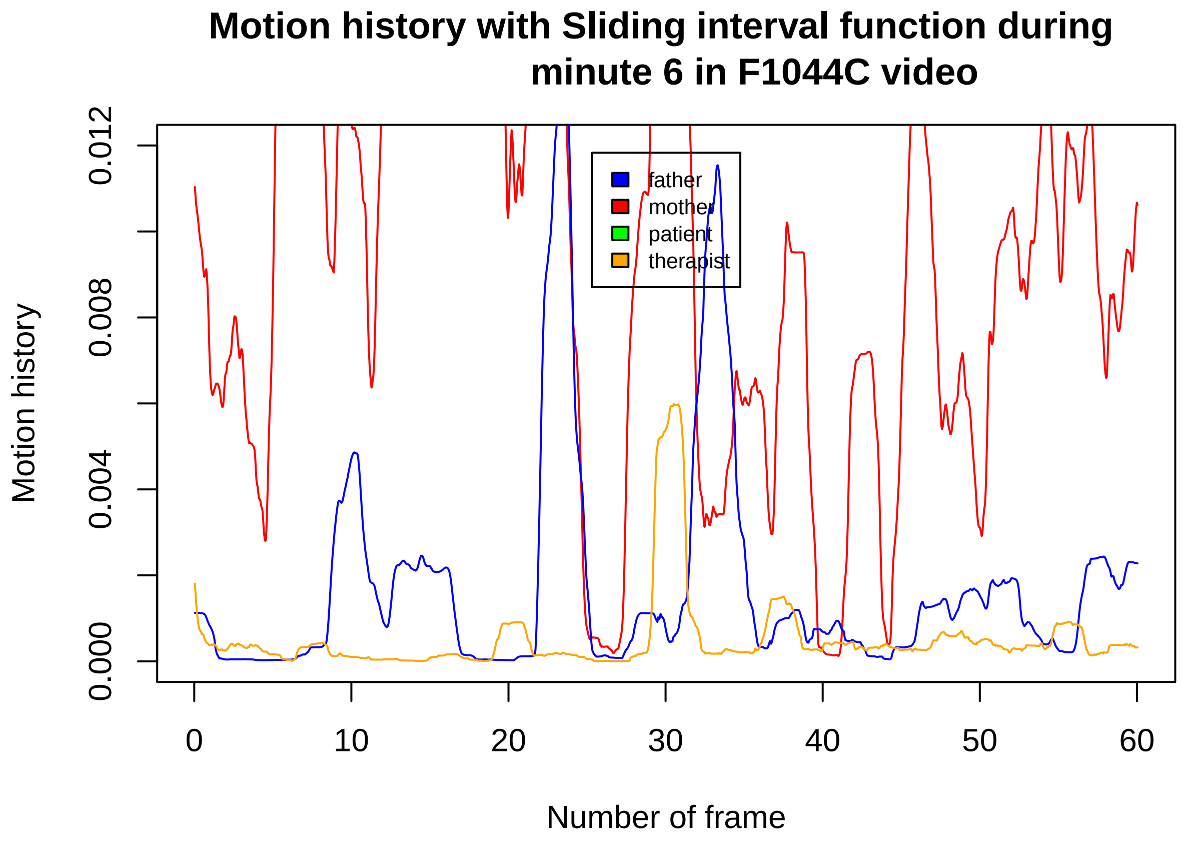


```
## 'data.frame':    1501 obs. of  6 variables:
##  $ slidedFatherMinute   : num  0.0173 0.0177 0.0181 0.0183 0.0185 ...
##  $ slidedMotherMinute   : num  7.71e-05 7.67e-05 7.63e-05 7.60e-05 7.71e-05 ...
##  $ slidedTherapistMinute: num  0.000311 0.000327 0.000358 0.000377 0.000424 ...
##  $ slidedPatientMinute  : num  NaN NaN NaN NaN NaN NaN NaN NaN NaN NaN ...
##  $ frames               : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ minute               : num  0.04 0.08 0.12 0.16 0.2 0.24 0.28 0.32 0.36 0.4 ...
```

Motion history with Sliding interval function during minute 5 in F1044C video

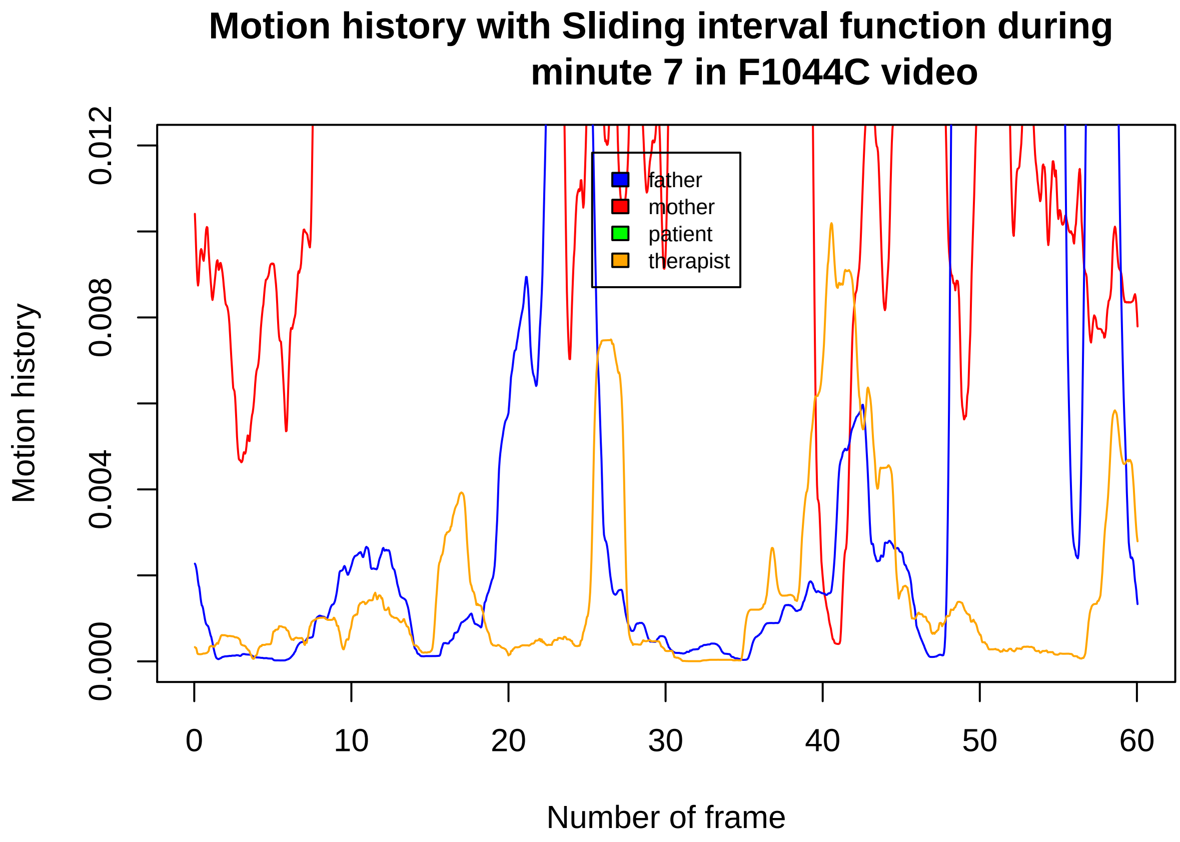


```
## 'data.frame':    1501 obs. of  6 variables:
##  $ slidedFatherMinute   : num  0.00113 0.00113 0.00113 0.00113 0.00113 ...
##  $ slidedMotherMinute   : num  0.011 0.0108 0.0106 0.0105 0.0104 ...
##  $ slidedTherapistMinute: num  0.00181 0.00159 0.00137 0.00119 0.00104 ...
##  $ slidedPatientMinute  : num  NaN NaN NaN NaN NaN NaN NaN NaN NaN NaN ...
##  $ frames               : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ minute               : num  0.04 0.08 0.12 0.16 0.2 0.24 0.28 0.32 0.36 0.4 ...
```

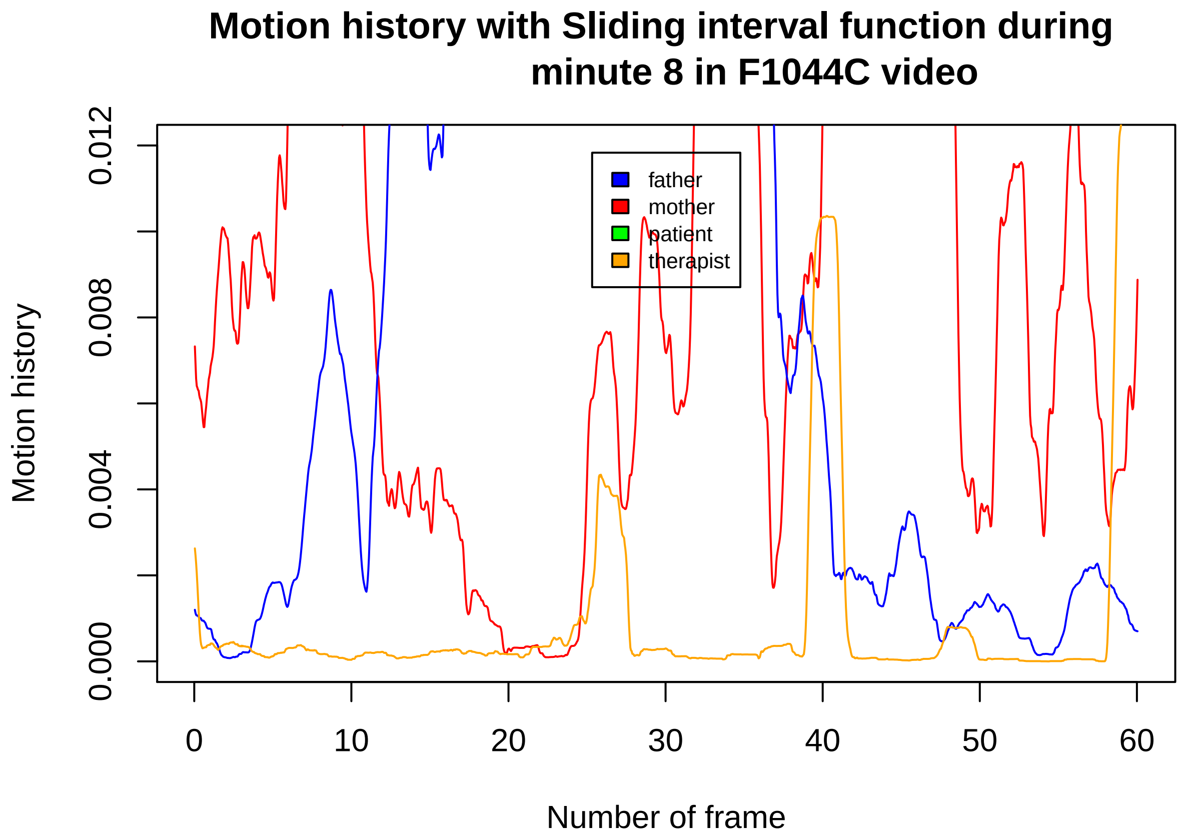


Motion history with Sliding interval function during minute 6 in F1044C video

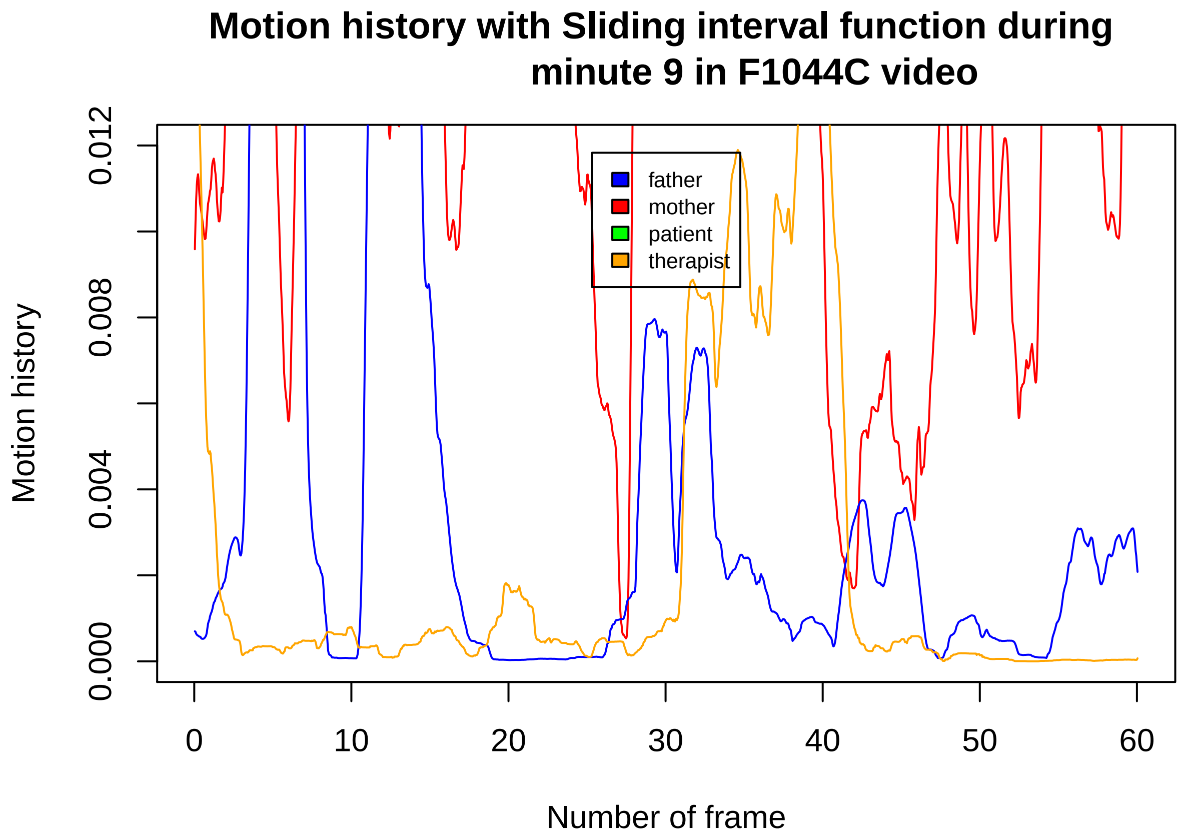
```
## 'data.frame':    1501 obs. of  6 variables:
##  $ slidedFatherMinute   : num  0.00227 0.00224 0.00218 0.0021 0.00199 ...
##  $ slidedMotherMinute   : num  0.01041 0.01002 0.00959 0.00918 0.00887 ...
##  $ slidedTherapistMinute: num  0.000333 0.000315 0.000312 0.000258 0.000185 ...
##  $ slidedPatientMinute  : num  NaN NaN NaN NaN NaN NaN NaN NaN NaN NaN ...
##  $ frames               : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ minute               : num  0.04 0.08 0.12 0.16 0.2 0.24 0.28 0.32 0.36 0.4 ...
```



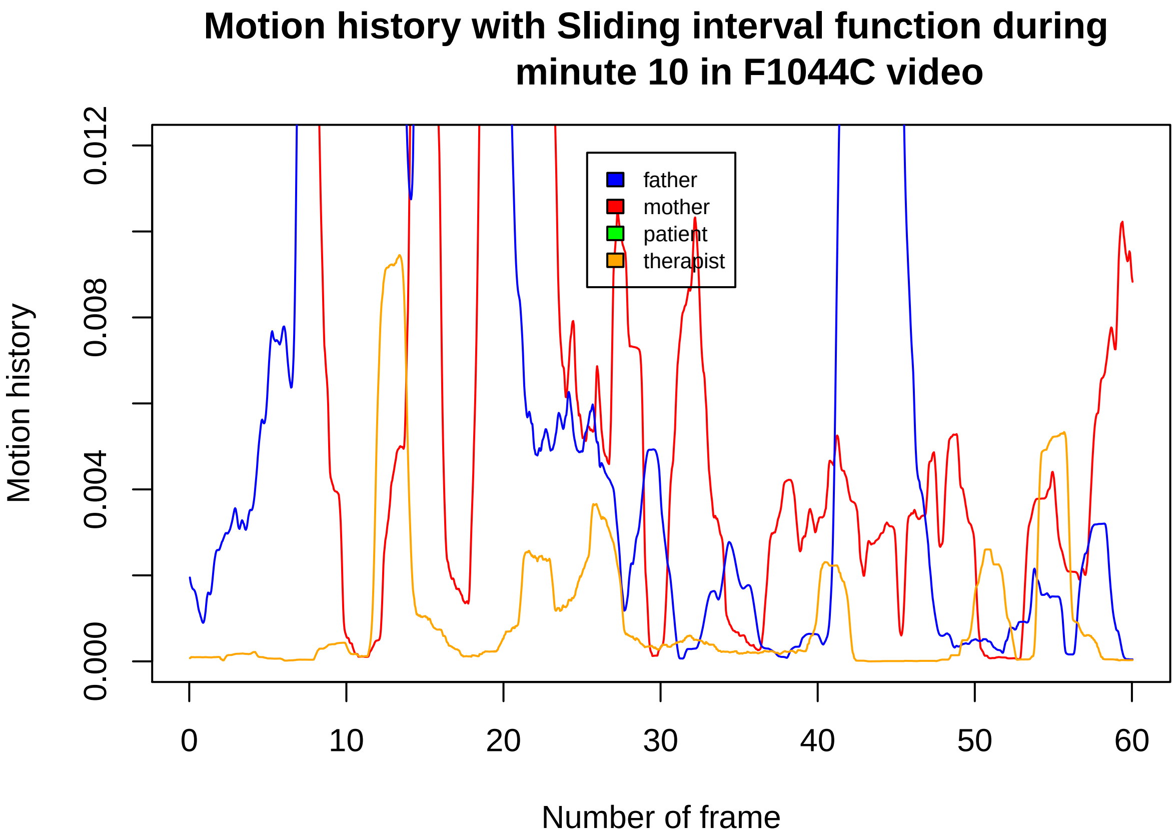
```
## 'data.frame':    1501 obs. of  6 variables:
##  $ slidedFatherMinute   : num  0.0012 0.00112 0.00108 0.00107 0.00107 ...
##  $ slidedMotherMinute   : num  0.00733 0.00693 0.00657 0.00641 0.00636 ...
##  $ slidedTherapistMinute: num  0.00263 0.00247 0.00228 0.00205 0.00177 ...
##  $ slidedPatientMinute  : num  NaN NaN NaN NaN NaN NaN NaN NaN NaN NaN ...
##  $ frames               : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ minute               : num  0.04 0.08 0.12 0.16 0.2 0.24 0.28 0.32 0.36 0.4 ...
```



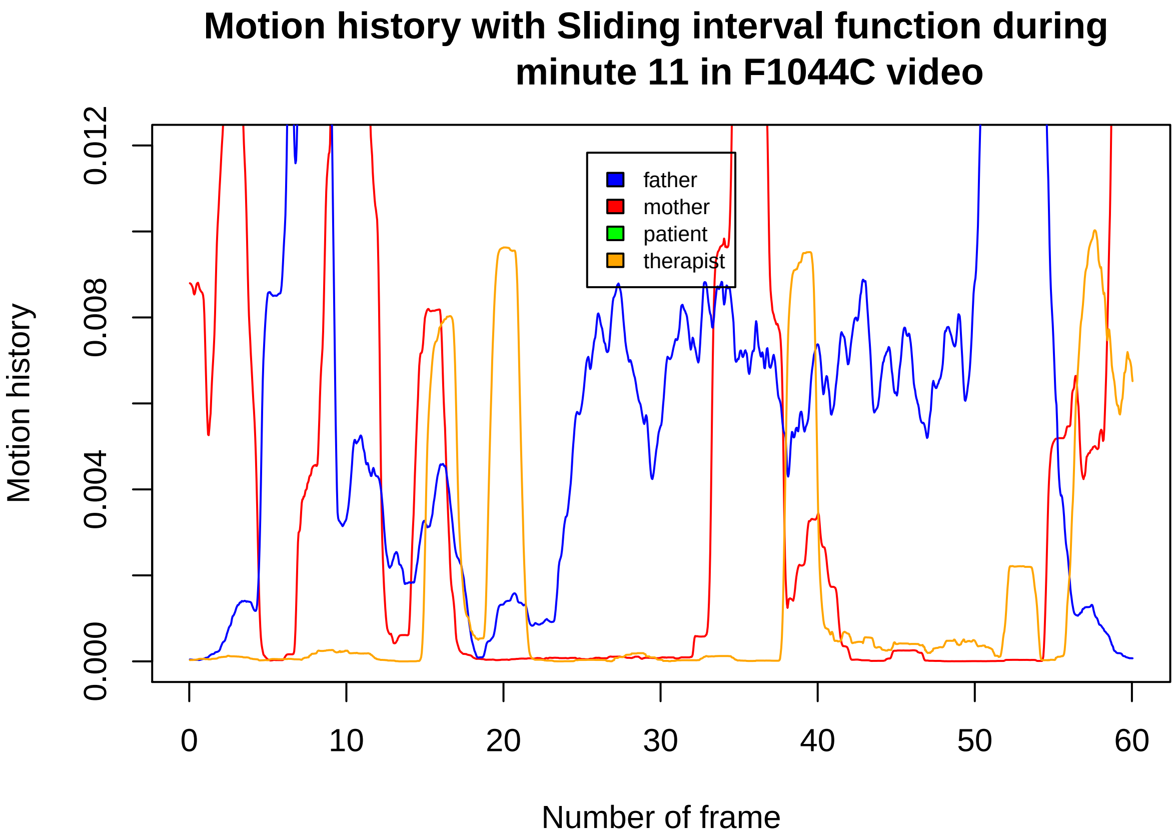
```
## 'data.frame':    1501 obs. of  6 variables:
##  $ slidedFatherMinute   : num  0.000699 0.000686 0.000645 0.000622 0.000607 ...
##  $ slidedMotherMinute   : num  0.00959 0.01022 0.01071 0.01107 0.01125 ...
##  $ slidedTherapistMinute: num  0.0163 0.0161 0.0157 0.0153 0.0148 ...
##  $ slidedPatientMinute  : num  NaN NaN NaN NaN NaN NaN NaN NaN NaN NaN ...
##  $ frames               : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ minute               : num  0.04 0.08 0.12 0.16 0.2 0.24 0.28 0.32 0.36 0.4 ...
```



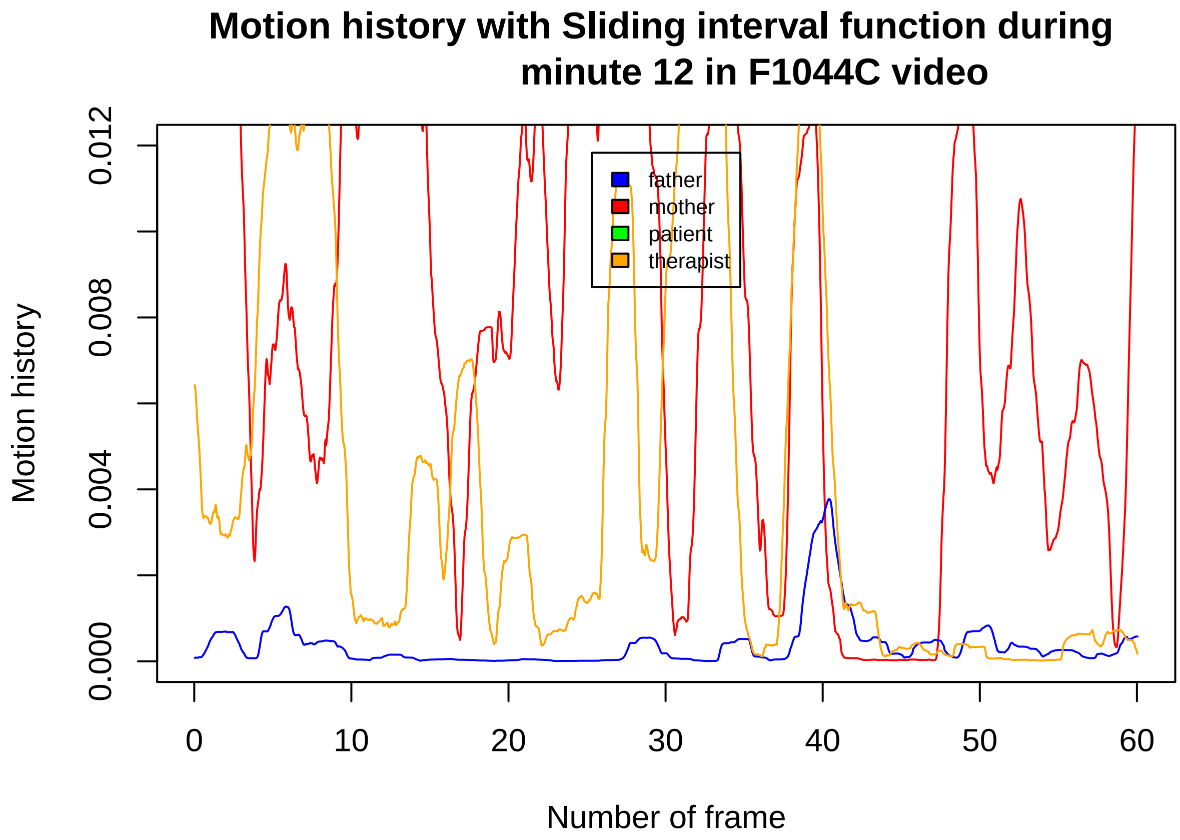
```
## 'data.frame':    1501 obs. of  6 variables:
##  $ slidedFatherMinute   : num  0.00195 0.00185 0.00179 0.00174 0.0017 ...
##  $ slidedMotherMinute   : num  0.0298 0.0299 0.0302 0.0307 0.0315 ...
##  $ slidedTherapistMinute: num  7.55e-05 8.06e-05 9.93e-05 9.85e-05 9.85e-05 ...
##  $ slidedPatientMinute  : num  NaN NaN NaN NaN NaN NaN NaN NaN NaN NaN ...
##  $ frames               : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ minute               : num  0.04 0.08 0.12 0.16 0.2 0.24 0.28 0.32 0.36 0.4 ...
```



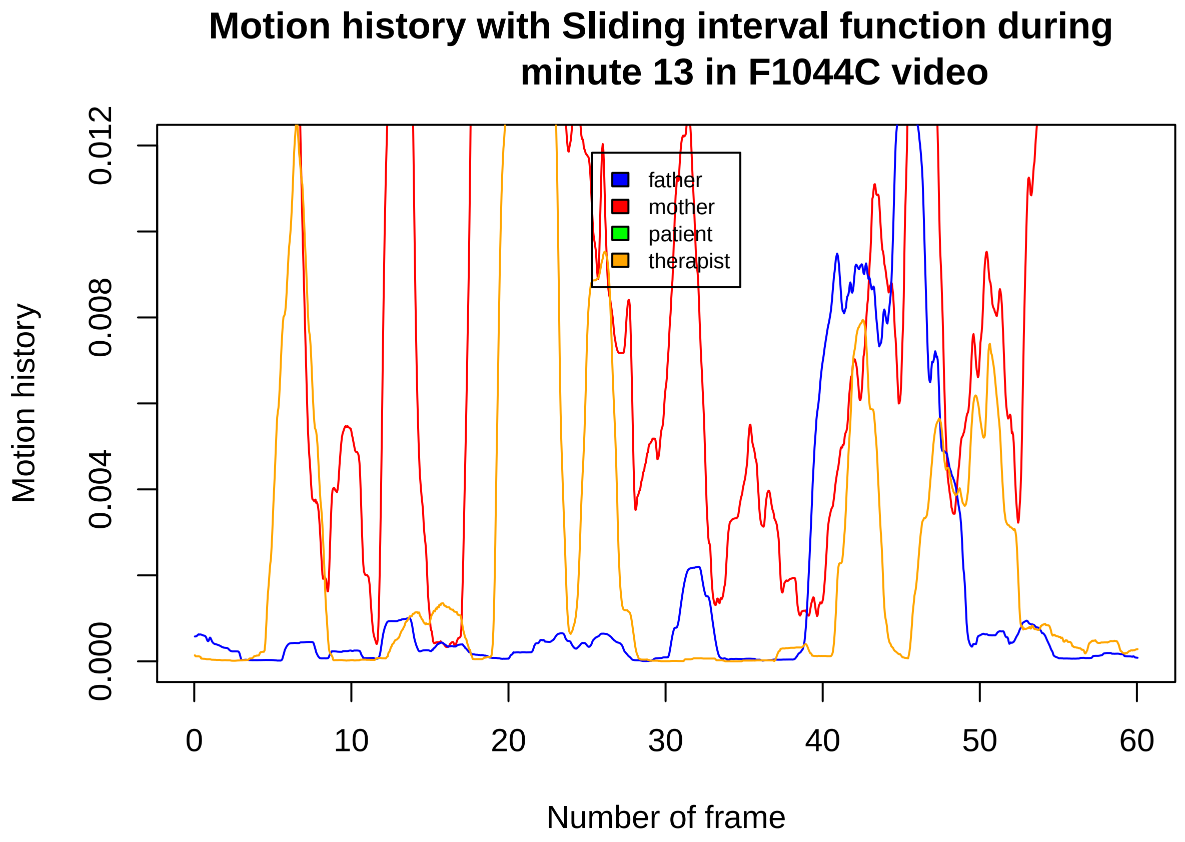
```
## 'data.frame':    1501 obs. of  6 variables:
##  $ slidedFatherMinute   : num  4.44e-05 4.27e-05 4.24e-05 4.11e-05 3.94e-05 ...
##  $ slidedMotherMinute   : num  0.0088 0.00878 0.00877 0.00874 0.00871 ...
##  $ slidedTherapistMinute: num  2.97e-05 3.14e-05 3.23e-05 3.23e-05 3.23e-05 ...
##  $ slidedPatientMinute  : num  NaN NaN NaN NaN NaN NaN NaN NaN NaN NaN ...
##  $ frames               : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ minute               : num  0.04 0.08 0.12 0.16 0.2 0.24 0.28 0.32 0.36 0.4 ...
```



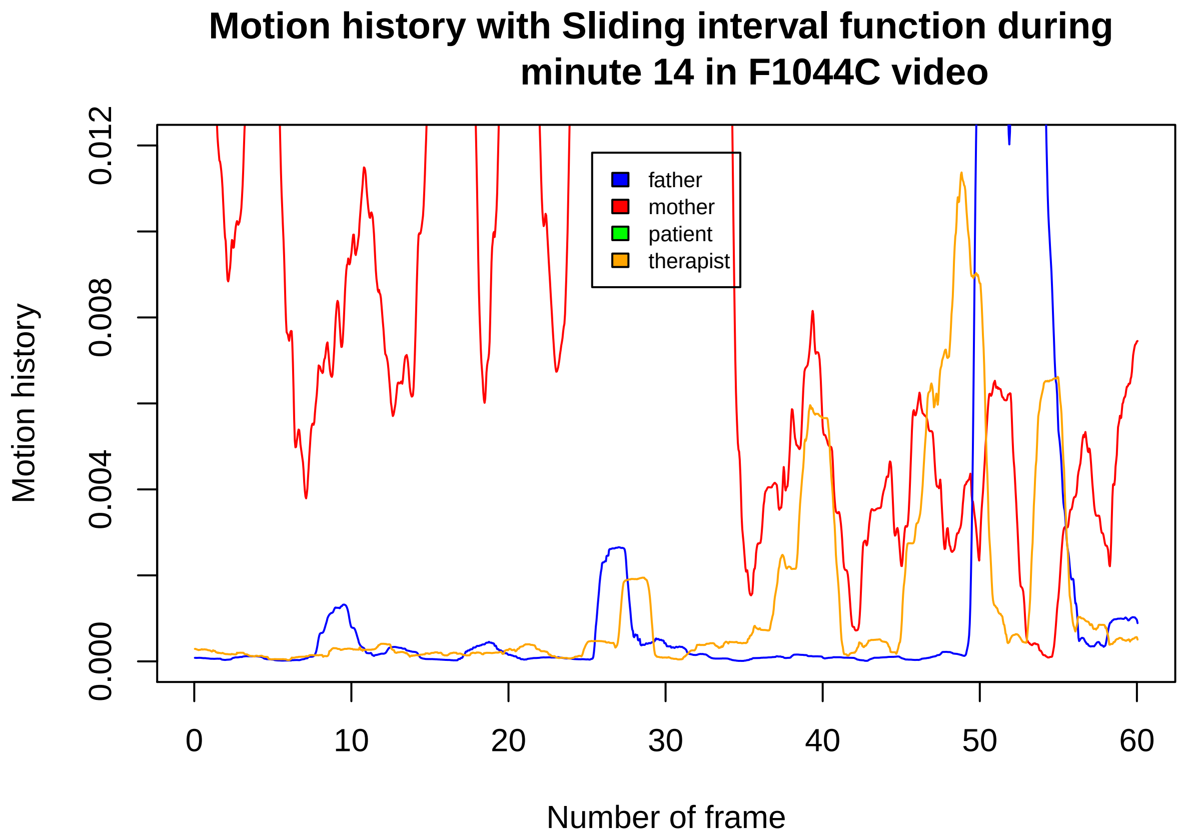
```
## 'data.frame':    1501 obs. of  6 variables:
##  $ slidedFatherMinute   : num  7.85e-05 8.81e-05 8.77e-05 8.54e-05 8.41e-05 ...
##  $ slidedMotherMinute   : num  0.0578 0.0588 0.0599 0.0608 0.0616 ...
##  $ slidedTherapistMinute: num  0.00642 0.00631 0.00607 0.0058 0.00553 ...
##  $ slidedPatientMinute  : num  NaN NaN NaN NaN NaN NaN NaN NaN NaN NaN ...
##  $ frames               : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ minute               : num  0.04 0.08 0.12 0.16 0.2 0.24 0.28 0.32 0.36 0.4 ...
```



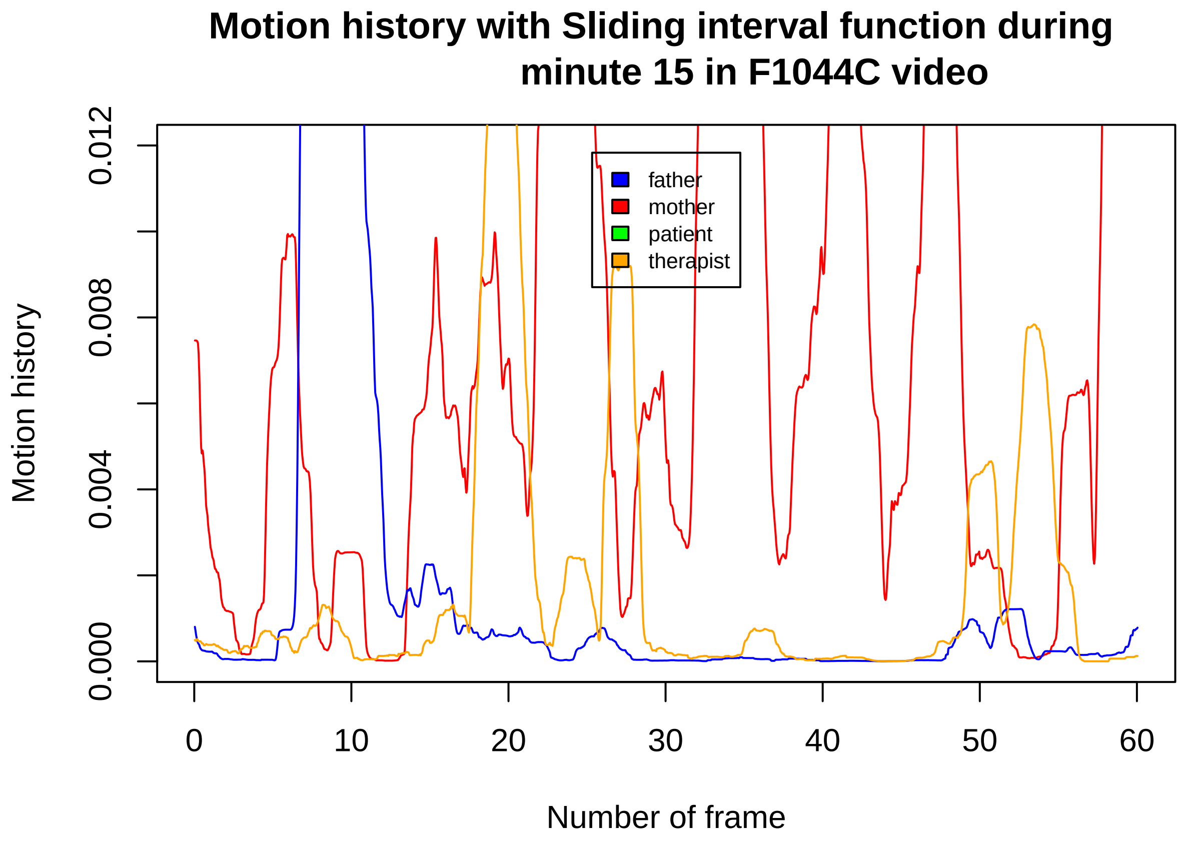
```
## 'data.frame':    1501 obs. of  6 variables:
##  $ slidedFatherMinute   : num  0.000579 0.00058 0.000584 0.000591 0.000606 ...
##  $ slidedMotherMinute   : num  0.0136 0.0138 0.0141 0.0144 0.0147 ...
##  $ slidedTherapistMinute: num  0.000142 0.00012 0.000118 0.000116 0.000117 ...
##  $ slidedPatientMinute  : num  NaN NaN NaN NaN NaN NaN NaN NaN NaN NaN ...
##  $ frames               : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ minute               : num  0.04 0.08 0.12 0.16 0.2 0.24 0.28 0.32 0.36 0.4 ...
```



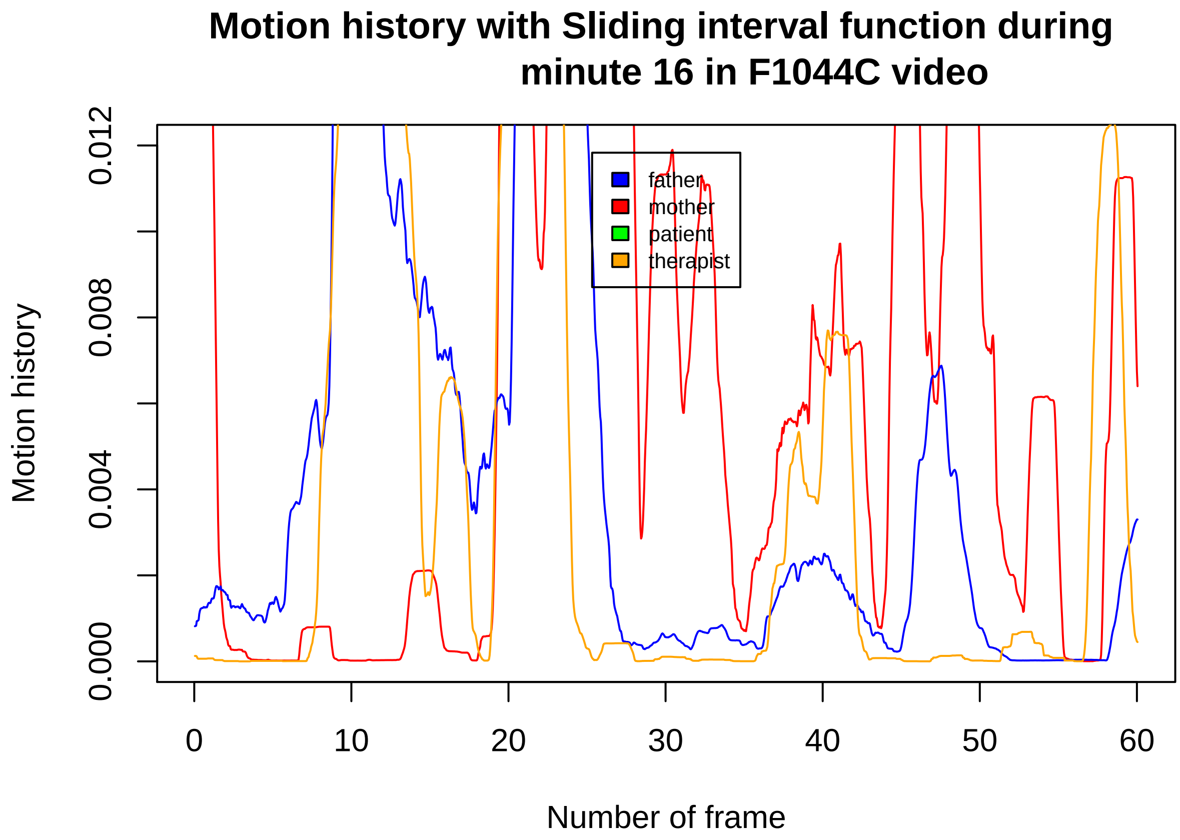
```
## 'data.frame':    1501 obs. of  6 variables:
##  $ slidedFatherMinute   : num  8.21e-05 8.18e-05 8.15e-05 8.02e-05 8.18e-05 ...
##  $ slidedMotherMinute   : num  0.0373 0.0367 0.0361 0.0356 0.0349 ...
##  $ slidedTherapistMinute: num  0.00029 0.00029 0.000283 0.000278 0.000272 ...
##  $ slidedPatientMinute  : num  NaN NaN NaN NaN NaN NaN NaN NaN NaN NaN ...
##  $ frames               : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ minute               : num  0.04 0.08 0.12 0.16 0.2 0.24 0.28 0.32 0.36 0.4 ...
```



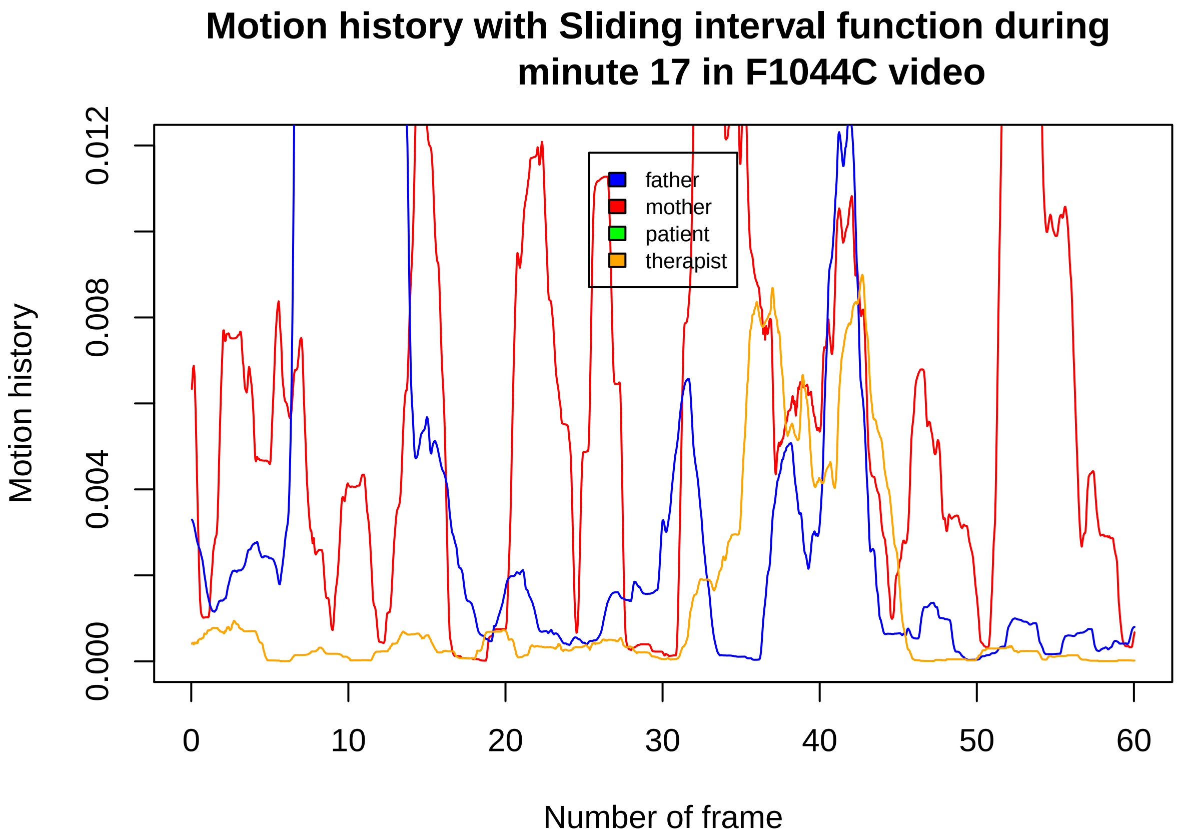
```
## 'data.frame':    1501 obs. of  6 variables:
##  $ slidedFatherMinute   : num  0.000804 0.000711 0.00061 0.000536 0.000471 ...
##  $ slidedMotherMinute   : num  0.00746 0.00747 0.00746 0.00746 0.00744 ...
##  $ slidedTherapistMinute: num  0.000497 0.000478 0.000483 0.000512 0.000517 ...
##  $ slidedPatientMinute  : num  NaN NaN NaN NaN NaN NaN NaN NaN NaN NaN ...
##  $ frames               : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ minute               : num  0.04 0.08 0.12 0.16 0.2 0.24 0.28 0.32 0.36 0.4 ...
```



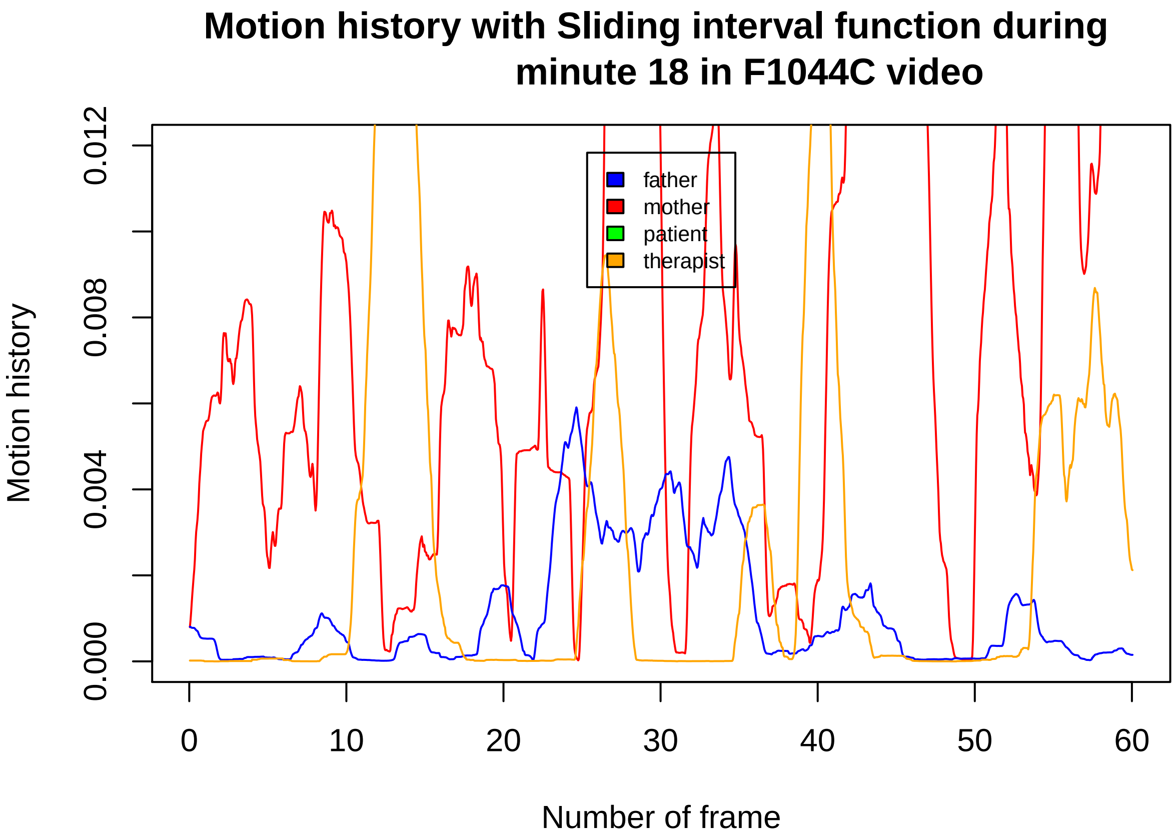
```
## 'data.frame':    1501 obs. of  6 variables:
##  $ slidedFatherMinute   : num  0.000816 0.000823 0.000829 0.000933 0.000942 ...
##  $ slidedMotherMinute   : num  0.0349 0.0344 0.0339 0.0336 0.0331 ...
##  $ slidedTherapistMinute: num  1.26e-04 1.26e-04 1.26e-04 1.13e-04 7.55e-05 ...
##  $ slidedPatientMinute  : num  NaN NaN NaN NaN NaN NaN NaN NaN NaN NaN ...
##  $ frames               : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ minute               : num  0.04 0.08 0.12 0.16 0.2 0.24 0.28 0.32 0.36 0.4 ...
```



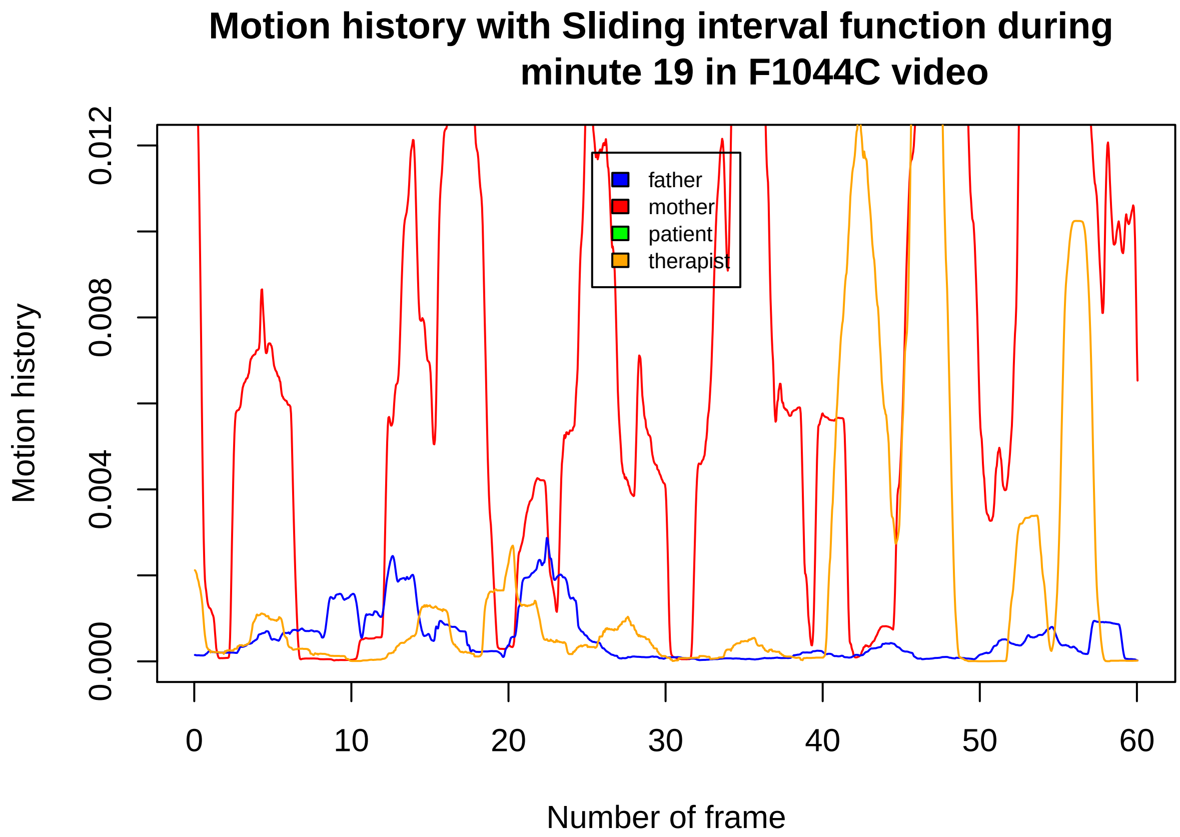
```
## 'data.frame':    1501 obs. of  6 variables:
##  $ slidedFatherMinute   : num  0.0033 0.00328 0.00324 0.00318 0.00312 ...
##  $ slidedMotherMinute   : num  0.00634 0.00659 0.00682 0.00688 0.00671 ...
##  $ slidedTherapistMinute: num  0.00041 0.000434 0.000432 0.000395 0.000441 ...
##  $ slidedPatientMinute  : num  NaN NaN NaN NaN NaN NaN NaN NaN NaN NaN ...
##  $ frames               : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ minute               : num  0.04 0.08 0.12 0.16 0.2 0.24 0.28 0.32 0.36 0.4 ...
```



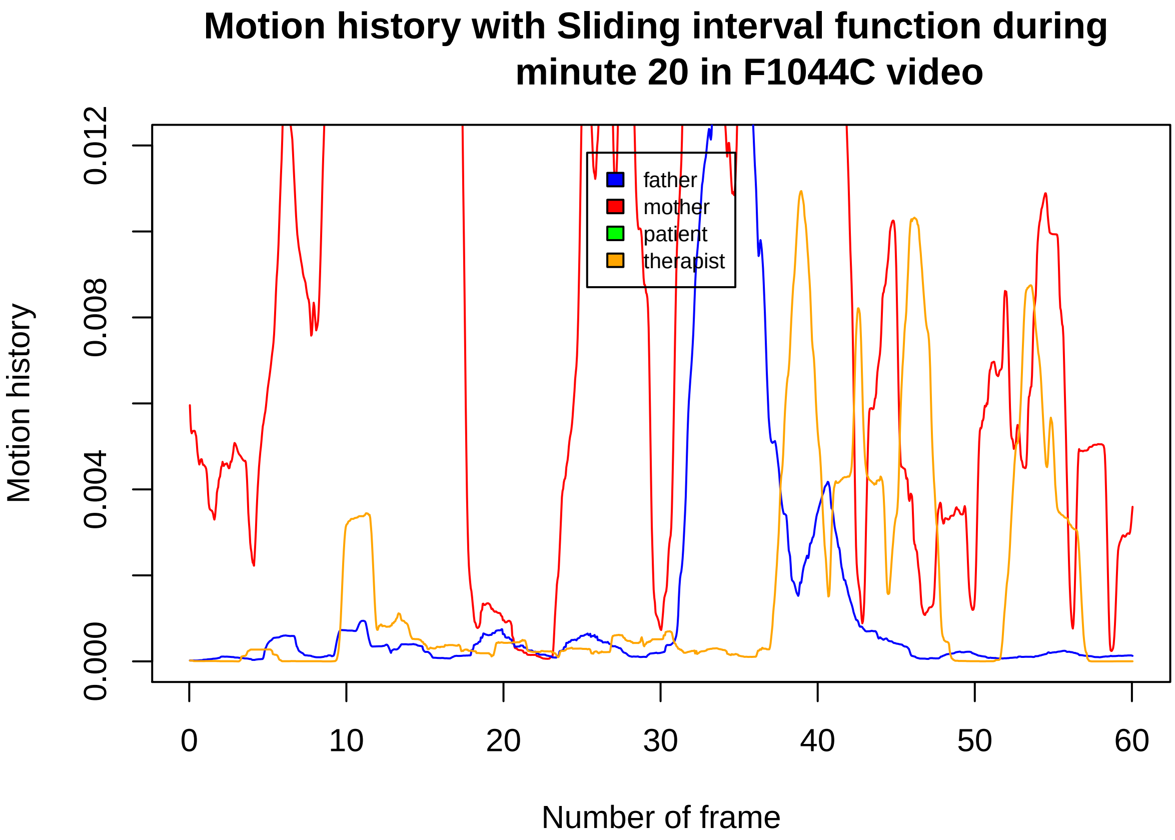
```
## 'data.frame':    1501 obs. of  6 variables:
##  $ slidedFatherMinute   : num  0.000805 0.000802 0.000789 0.000782 0.00078 ...
##  $ slidedMotherMinute   : num  0.000793 0.000949 0.001141 0.001373 0.001588 ...
##  $ slidedTherapistMinute: num  1.87e-05 1.87e-05 1.87e-05 1.87e-05 1.87e-05 ...
##  $ slidedPatientMinute  : num  NaN NaN NaN NaN NaN NaN NaN NaN NaN NaN ...
##  $ frames               : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ minute               : num  0.04 0.08 0.12 0.16 0.2 0.24 0.28 0.32 0.36 0.4 ...
```



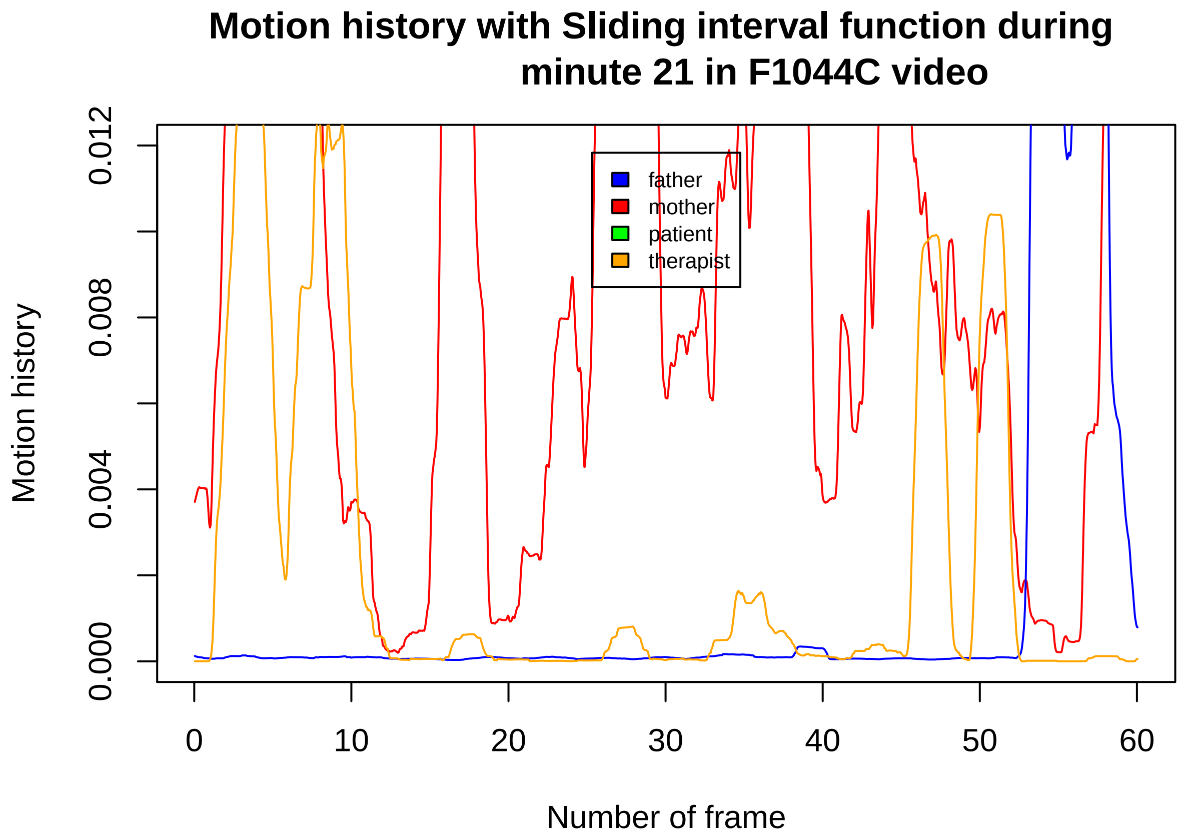
```
## 'data.frame':    1501 obs. of  6 variables:
##  $ slidedFatherMinute   : num  0.000149 0.000148 0.000142 0.000141 0.000142 ...
##  $ slidedMotherMinute   : num  0.0167 0.0158 0.015 0.0142 0.0134 ...
##  $ slidedTherapistMinute: num  0.00212 0.0021 0.00207 0.00203 0.00194 ...
##  $ slidedPatientMinute  : num  NaN NaN NaN NaN NaN NaN NaN NaN NaN NaN ...
##  $ frames               : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ minute               : num  0.04 0.08 0.12 0.16 0.2 0.24 0.28 0.32 0.36 0.4 ...
```



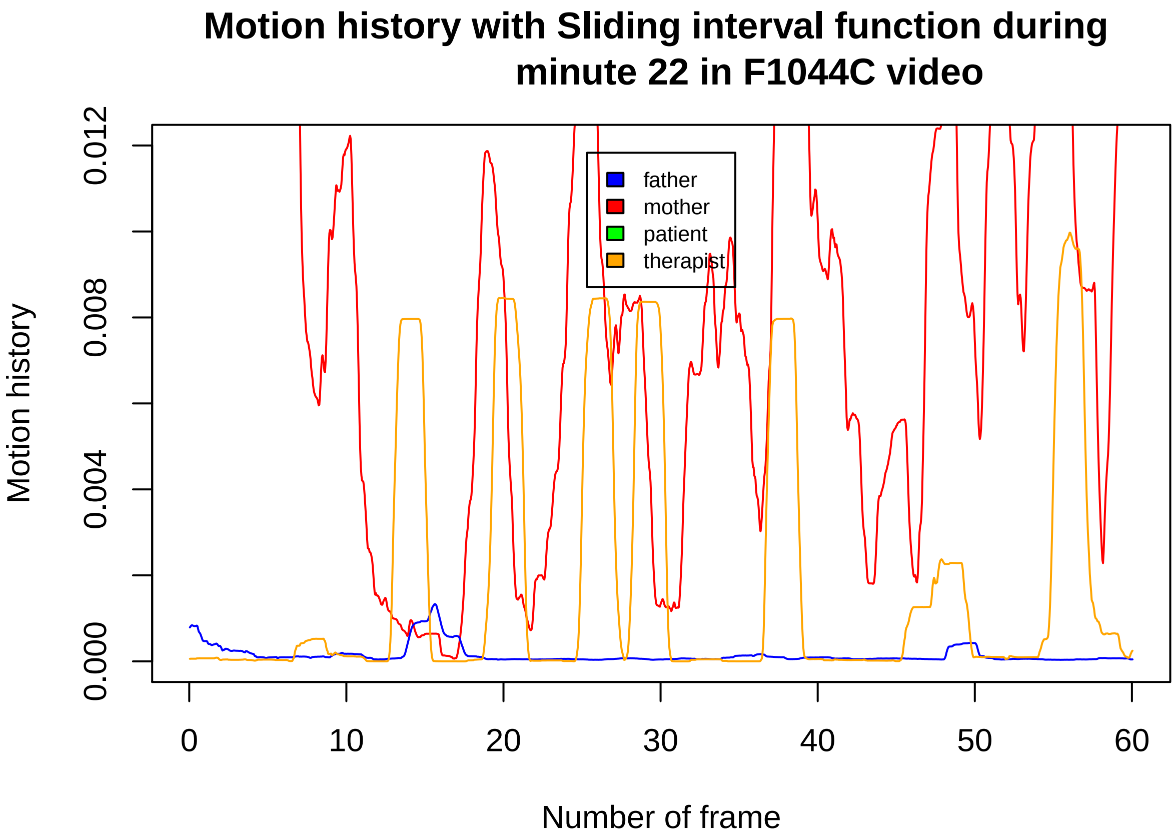
```
## 'data.frame':    1501 obs. of  6 variables:
##  $ slidedFatherMinute   : num  2.07e-05 2.00e-05 1.97e-05 1.97e-05 1.91e-05 ...
##  $ slidedMotherMinute   : num  0.00596 0.00558 0.00535 0.0053 0.00535 ...
##  $ slidedTherapistMinute: num  1.78e-05 1.78e-05 1.78e-05 1.78e-05 1.78e-05 ...
##  $ slidedPatientMinute  : num  NaN NaN NaN NaN NaN NaN NaN NaN NaN NaN ...
##  $ frames               : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ minute               : num  0.04 0.08 0.12 0.16 0.2 0.24 0.28 0.32 0.36 0.4 ...
```



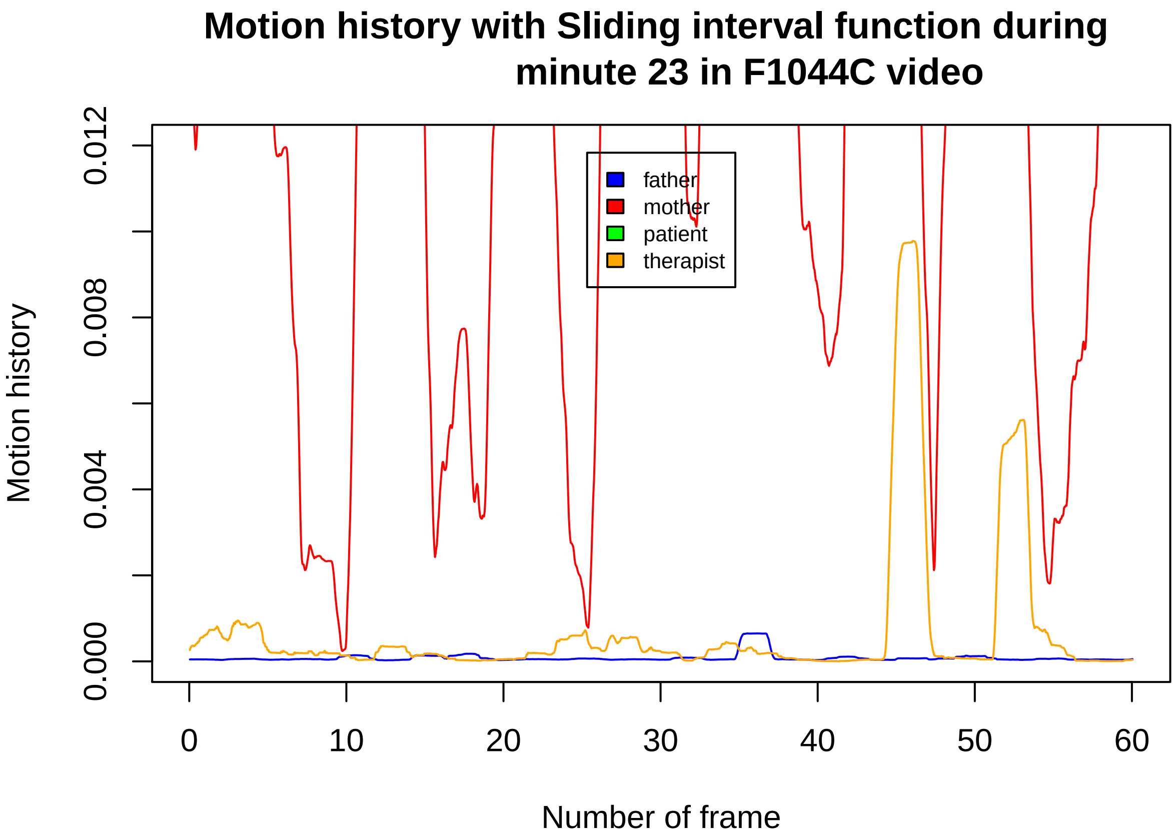
```
## 'data.frame':    1501 obs. of  6 variables:
##  $ slidedFatherMinute   : num  0.000126 0.000119 0.000111 0.000109 0.000106 ...
##  $ slidedMotherMinute   : num  0.00371 0.00378 0.00383 0.0039 0.00395 ...
##  $ slidedTherapistMinute: num  1.70e-06 1.70e-06 1.70e-06 1.70e-06 2.55e-06 ...
##  $ slidedPatientMinute  : num  NaN NaN NaN NaN NaN NaN NaN NaN NaN NaN ...
##  $ frames               : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ minute               : num  0.04 0.08 0.12 0.16 0.2 0.24 0.28 0.32 0.36 0.4 ...
```



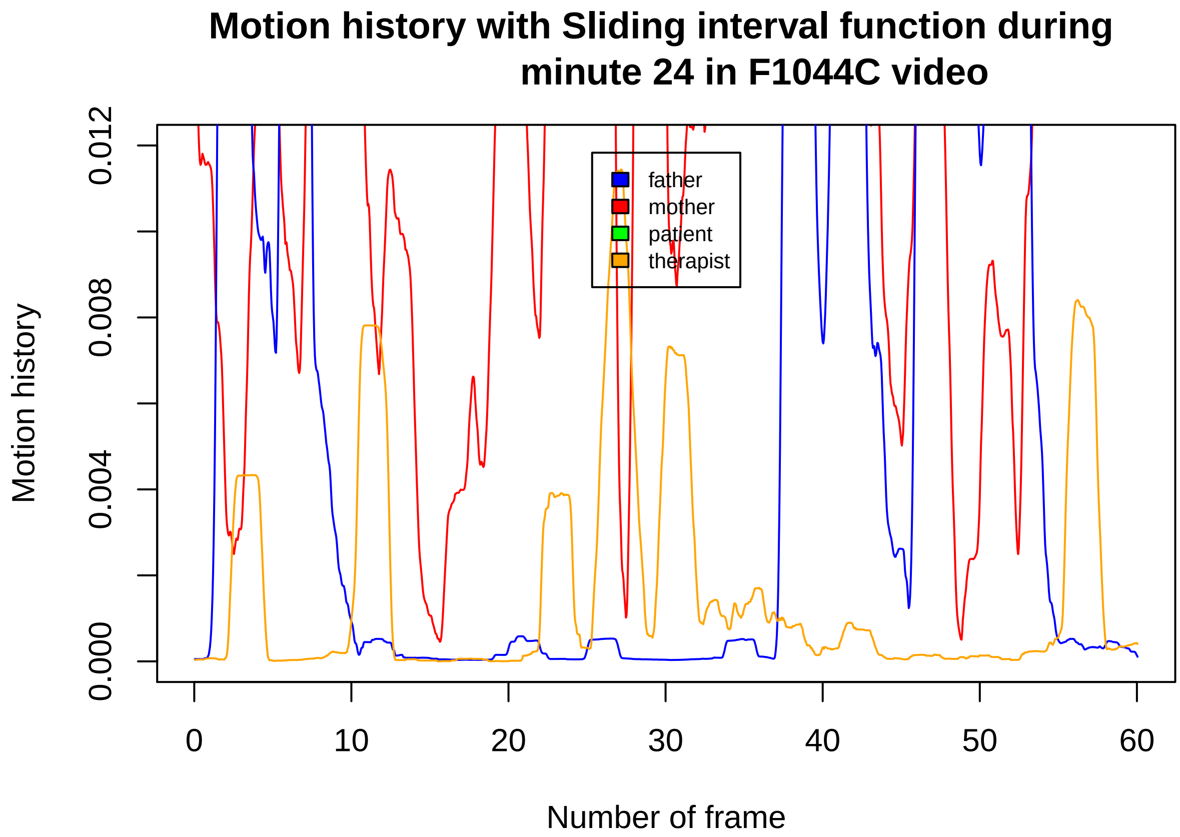
```
## 'data.frame':    1501 obs. of  6 variables:
##  $ slidedFatherMinute   : num  0.00079 0.000809 0.00083 0.000839 0.000838 ...
##  $ slidedMotherMinute   : num  0.0503 0.0511 0.0517 0.0519 0.0515 ...
##  $ slidedTherapistMinute: num  5.94e-05 6.11e-05 6.20e-05 6.20e-05 6.20e-05 ...
##  $ slidedPatientMinute  : num  NaN NaN NaN NaN NaN NaN NaN NaN NaN NaN ...
##  $ frames               : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ minute               : num  0.04 0.08 0.12 0.16 0.2 0.24 0.28 0.32 0.36 0.4 ...
```



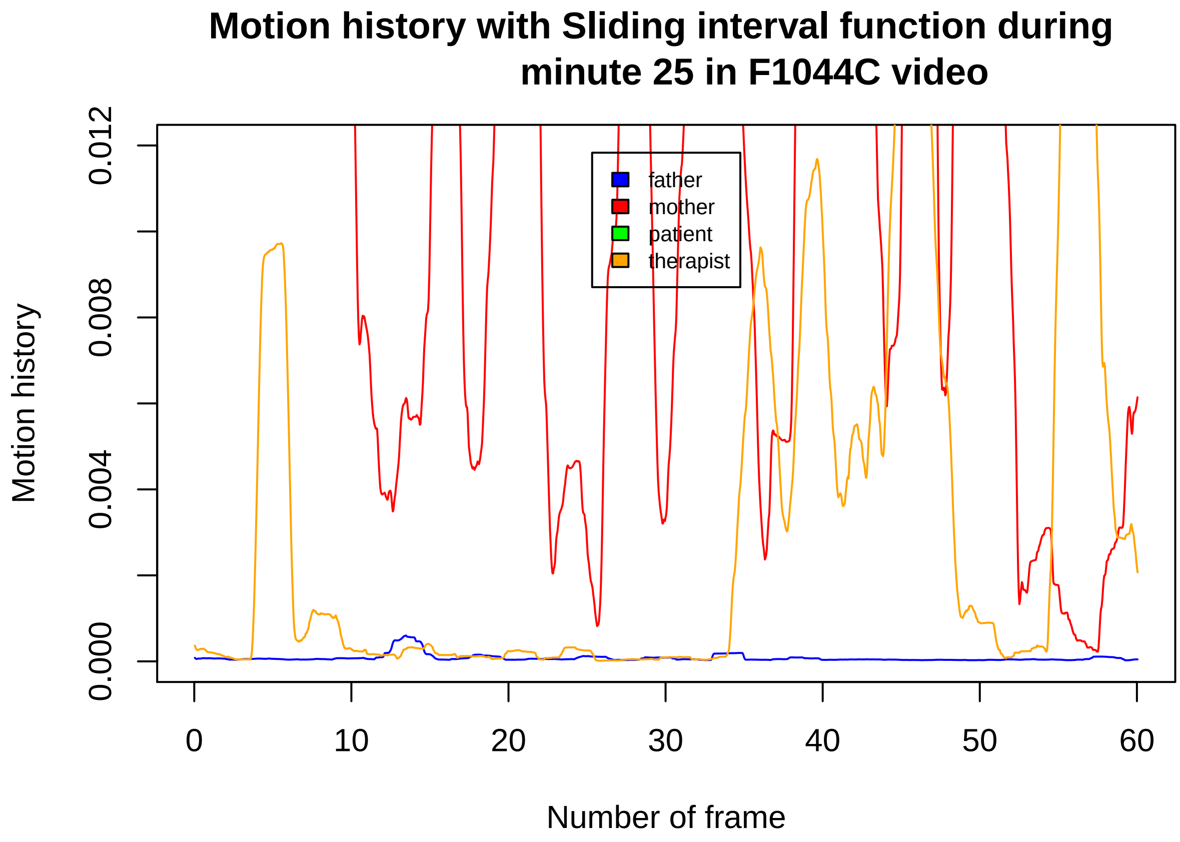
```
## 'data.frame':    1501 obs. of  6 variables:
##  $ slidedFatherMinute   : num  4.47e-05 4.47e-05 4.63e-05 4.57e-05 4.53e-05 ...
##  $ slidedMotherMinute   : num  0.0151 0.015 0.0147 0.0143 0.0138 ...
##  $ slidedTherapistMinute: num  0.000261 0.000321 0.000337 0.000354 0.000368 ...
##  $ slidedPatientMinute  : num  NaN NaN NaN NaN NaN NaN NaN NaN NaN NaN ...
##  $ frames               : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ minute               : num  0.04 0.08 0.12 0.16 0.2 0.24 0.28 0.32 0.36 0.4 ...
```



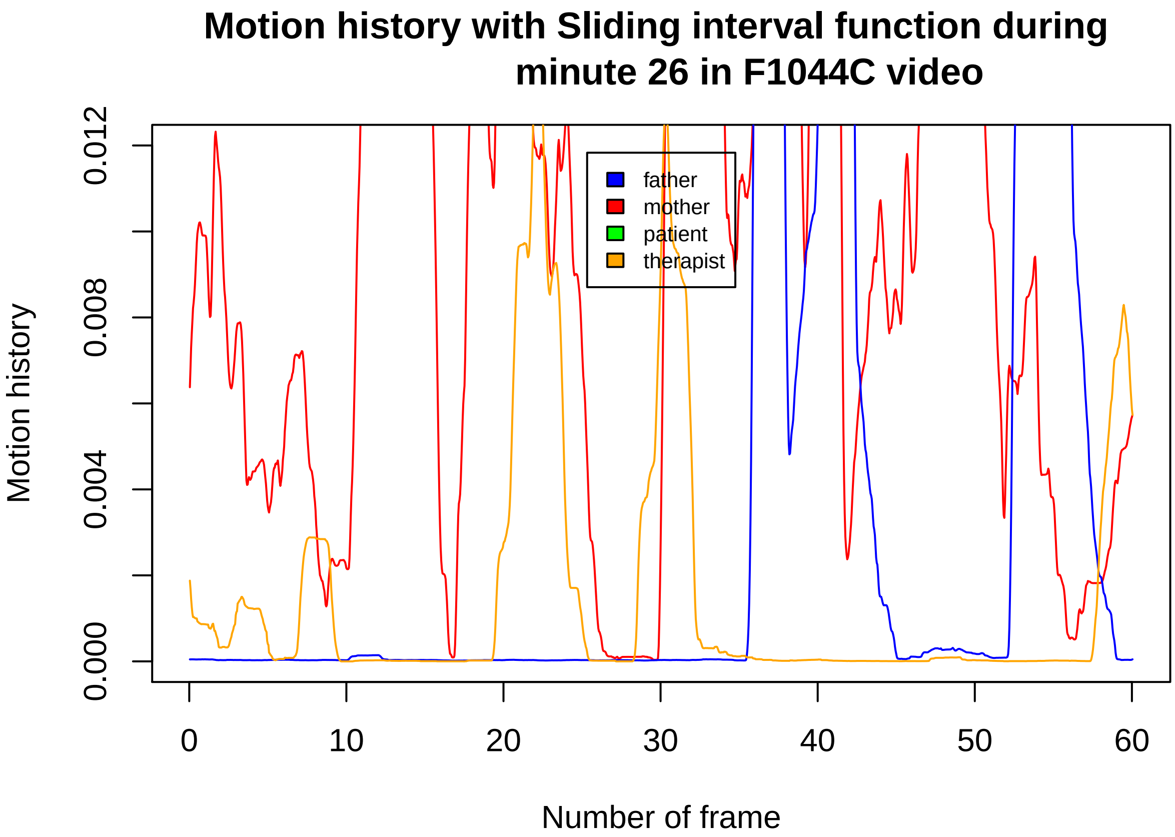
```
## 'data.frame':    1501 obs. of  6 variables:
##  $ slidedFatherMinute   : num  5.42e-05 5.45e-05 5.32e-05 5.29e-05 5.29e-05 ...
##  $ slidedMotherMinute   : num  0.0135 0.0136 0.0137 0.0136 0.0133 ...
##  $ slidedTherapistMinute: num  3.56e-05 3.56e-05 3.65e-05 3.82e-05 4.24e-05 ...
##  $ slidedPatientMinute  : num  NaN NaN NaN NaN NaN NaN NaN NaN NaN NaN ...
##  $ frames               : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ minute               : num  0.04 0.08 0.12 0.16 0.2 0.24 0.28 0.32 0.36 0.4 ...
```



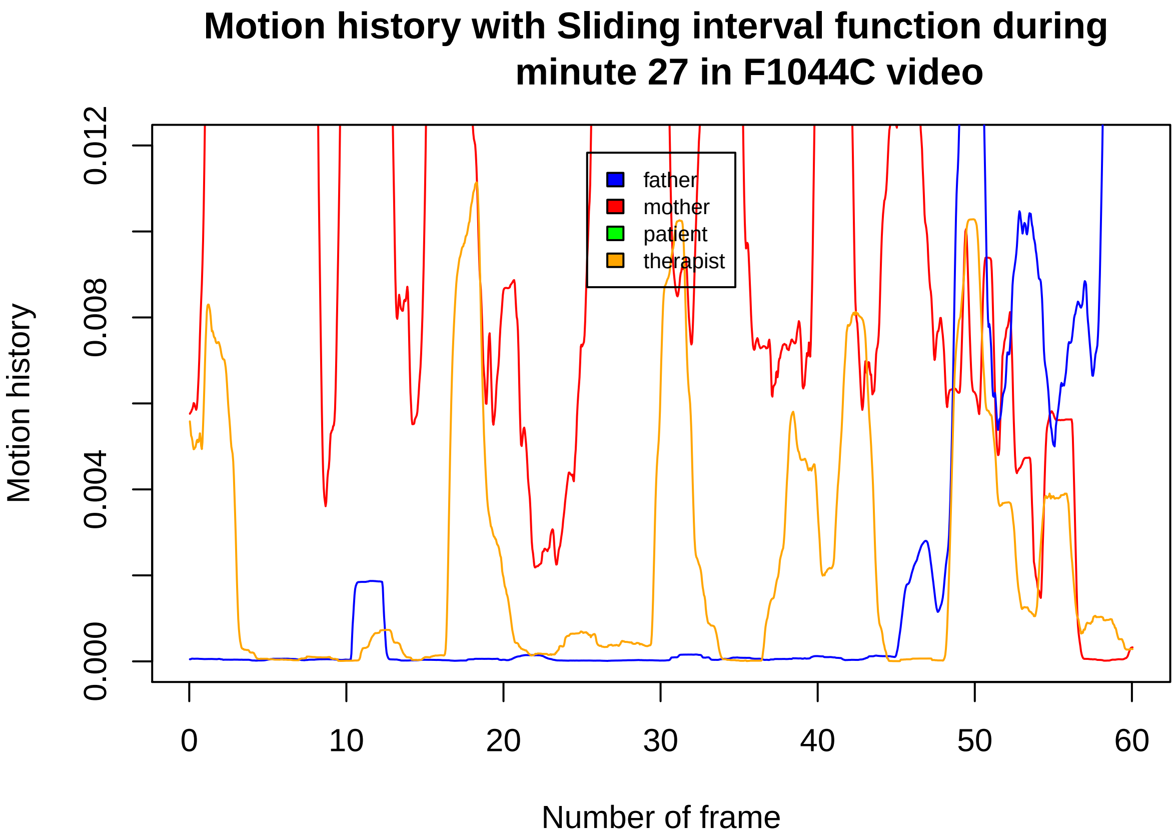
```
## 'data.frame':    1501 obs. of  6 variables:
##  $ slidedFatherMinute   : num  8.25e-05 6.67e-05 5.78e-05 5.55e-05 5.98e-05 ...
##  $ slidedMotherMinute   : num  0.0435 0.0434 0.0432 0.043 0.0429 ...
##  $ slidedTherapistMinute: num  0.000367 0.000322 0.000292 0.000272 0.000263 ...
##  $ slidedPatientMinute  : num  NaN NaN NaN NaN NaN NaN NaN NaN NaN NaN ...
##  $ frames               : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ minute               : num  0.04 0.08 0.12 0.16 0.2 0.24 0.28 0.32 0.36 0.4 ...
```



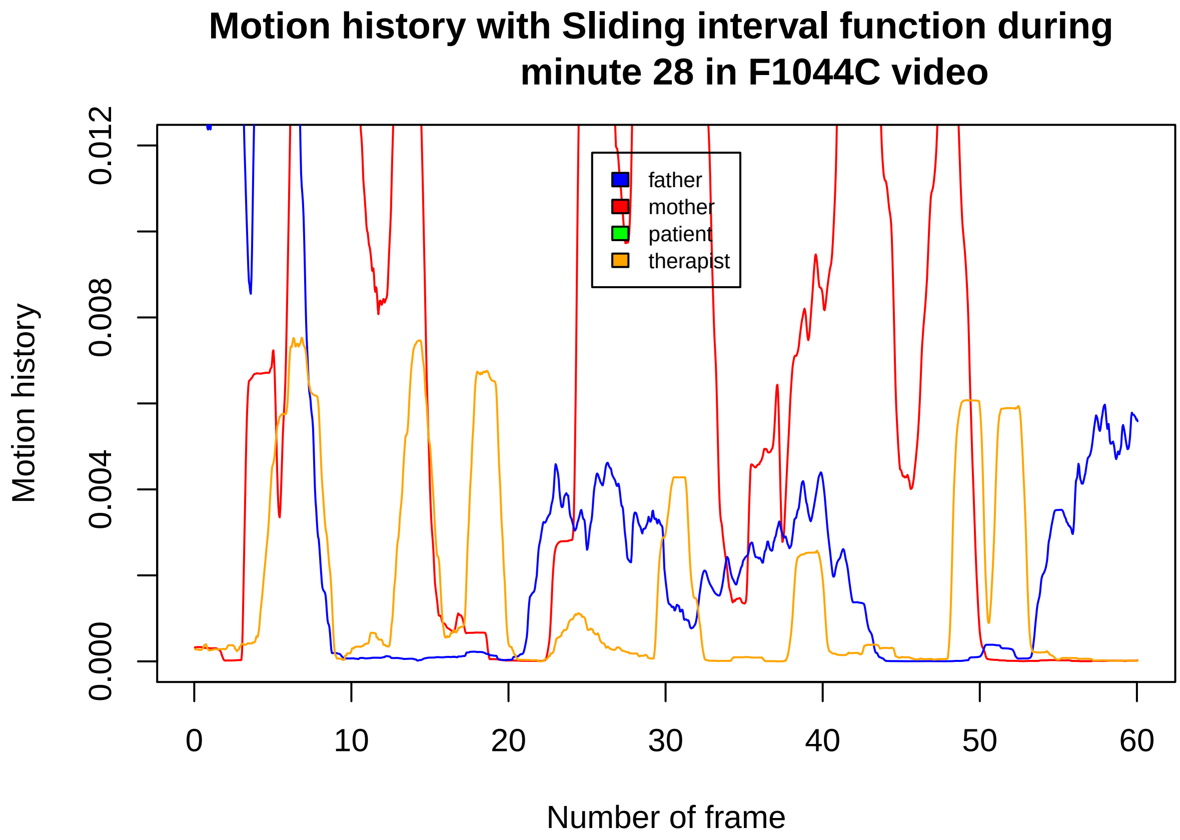
```
## 'data.frame':    1501 obs. of  6 variables:
##  $ slidedFatherMinute   : num  4.63e-05 4.60e-05 4.63e-05 4.73e-05 4.70e-05 ...
##  $ slidedMotherMinute   : num  0.00638 0.00683 0.0073 0.00762 0.00792 ...
##  $ slidedTherapistMinute: num  0.00188 0.00169 0.00146 0.00127 0.00112 ...
##  $ slidedPatientMinute  : num  NaN NaN NaN NaN NaN NaN NaN NaN NaN NaN ...
##  $ frames               : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ minute               : num  0.04 0.08 0.12 0.16 0.2 0.24 0.28 0.32 0.36 0.4 ...
```



```
## 'data.frame':    1501 obs. of  6 variables:
##  $ slidedFatherMinute   : num  4.93e-05 5.06e-05 5.52e-05 6.28e-05 6.31e-05 ...
##  $ slidedMotherMinute   : num  0.00576 0.00579 0.0058 0.00585 0.00588 ...
##  $ slidedTherapistMinute: num  0.00558 0.00542 0.00525 0.00521 0.00513 ...
##  $ slidedPatientMinute  : num  NaN NaN NaN NaN NaN NaN NaN NaN NaN NaN ...
##  $ frames               : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ minute               : num  0.04 0.08 0.12 0.16 0.2 0.24 0.28 0.32 0.36 0.4 ...
```



```
## 'data.frame':    1501 obs. of  6 variables:
##  $ slidedFatherMinute   : num  0.0266 0.0258 0.0248 0.0237 0.0226 ...
##  $ slidedMotherMinute   : num  0.000326 0.000327 0.00033 0.000331 0.000332 ...
##  $ slidedTherapistMinute: num  0.000286 0.000278 0.000277 0.000277 0.000277 ...
##  $ slidedPatientMinute  : num  NaN NaN NaN NaN NaN NaN NaN NaN NaN NaN ...
##  $ frames               : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ minute               : num  0.04 0.08 0.12 0.16 0.2 0.24 0.28 0.32 0.36 0.4 ...
```



Export no log filtered data in text files

```
## REMINDER:
#SlidingInterval <- function(subject, indexOfvideos=1:NumberOfvideos, interval, data) with :
# subject : subject studied (patient, mother, father or therapist)
# indexOfvideos : list of videos studied (element eg. 3 or list eg 1:3 or c(1,2,4))
# interval : number of frames in the studied interval
# data : data frame where there is data

#index de la vid?eo de 1ere a la length de indexvideo

videoIndex <- 1
# videoName est le nom de la video actuelle
for (videoName in indexList){
# Compute slinding interval for each participant
      print(paste("Computing slidedFather", videoName))
      slidedFather <- SlidingInterval("father", videoIndex, 5, data)

      print(paste("Computing slidedMother", videoName))
      slidedMother <- SlidingInterval("mother", videoIndex, 5, data)

      print(paste("Computing slidedPatient", videoName))
      slidedPatient <- SlidingInterval("patient", videoIndex, 5, data)

      print(paste("Computing slidedTherapist", videoName))
      slidedTherapist <- SlidingInterval("therapist", videoIndex, 5, data)

# create a data frame to store temporarily this data with NA
      slidedVideo <- data.frame(
        slidedFather, slidedMother, slidedPatient, slidedTherapist,
        "video"=rep(indexList[videoIndex], length(slidedFather)),
        frame_index = 1:length(slidedFather))

      str(slidedVideo)
      summary(slidedVideo)
#      dfSliding <- data.frame()
#      for (participant in 1:4){
# If the colum is not empty, takes its length and begin a data frame with it
#          if (dataFrame == FALSE & (length(slidedVideo[participant][!is.na(slidedVideo[participant])])
#                dfSliding <- data.frame(
#                  "video"=rep(indexList[videoIndex], length(slidedVideo[participant])),
#                  frame_index = (1:dim(slidedVideo[1])[1]),
#                  slidedVideo[participant])
#                  dataFrame <- TRUE}
#          else if (dataFrame == FALSE){}
#          else{
#            dfSliding <- cbind(dfSliding, slidedVideo[participant])}
#      }
      write.csv(slidedVideo, paste("/Users/Ofix/Documents/Fac/internat/Recherche/projets/synchro/synchr
      videoIndex <-(videoIndex+1)
}
```

Export log filtered data in text files

```
videoIndex <- 1
# videoName est le nom de la video actuelle
for (videoName in indexList){
# Compute slinding interval for each participant
      print(paste("Computing slidedFather", videoName))
      slidedFather <- SlidingInterval("logFather", videoIndex, 5, data)

      print(paste("Computing slidedMother", videoName))
      slidedMother <- SlidingInterval("logMother", videoIndex, 5, data)

      print(paste("Computing slidedPatient", videoName))
      slidedPatient <- SlidingInterval("logPatient", videoIndex, 5, data)

      print(paste("Computing slidedTherapist", videoName))
      slidedTherapist <- SlidingInterval("logTherapist", videoIndex, 5, data)

# create a data frame to store temporarily this data with NA

      slidedVideo <- data.frame(
        slidedFather, slidedMother, slidedPatient, slidedTherapist,
        "video"=rep(indexList[videoIndex], length(slidedFather)),
        frame_index = 1:length(slidedFather))
        write.csv(slidedVideo, paste("/Users/Ofix/Documents/Fac/internat/Recherche/projets/synchro/s
  videoIndex <-(videoIndex+1)
  }
```

SyncPy utilisation for creating synchrony dataframe

After extracting filtered motion motion history with mean on sliding interval (overlapping interval) of 5 frames

And after puting this data on a CSV file slideddata.csv

We import this data on python Script with panda module Call_S_Estimator.py

This script will compute the synchrony between each dyad of the interaction and of the whole group

It will return a csv file for each video SSIXXXX.csv with XXXX the name of the video (F1044C, F1044D1, etc) that we can import with R with

this following function

```
## [1] "SSI Files Directory"

## [1] "SSI Files List"

##  [1] "../Data/CSV/Synchrony/log/F1002A1.log.slideddata.csv.csv"
##  [2] "../Data/CSV/Synchrony/log/F1002A2.log.slideddata.csv.csv"
##  [3] "../Data/CSV/Synchrony/log/F1002B2.log.slideddata.csv.csv"
##  [4] "../Data/CSV/Synchrony/log/F1002C1.log.slideddata.csv.csv"
##  [5] "../Data/CSV/Synchrony/log/F1044C1.log.slideddata.csv.csv"
##  [6] "../Data/CSV/Synchrony/log/F1044C2.log.slideddata.csv.csv"
##  [7] "../Data/CSV/Synchrony/log/F1044D1.log.slideddata.csv.csv"
##  [8] "../Data/CSV/Synchrony/log/F1044D2.log.slideddata.csv.csv"
##  [9] "../Data/CSV/Synchrony/log/F1044E1.log.slideddata.csv.csv"
## [10] "../Data/CSV/Synchrony/log/F1044E2.log.slideddata.csv.csv"
## [11] "../Data/CSV/Synchrony/log/F1044F1.log.slideddata.csv.csv"
## [12] "../Data/CSV/Synchrony/log/F1044F2.log.slideddata.csv.csv"
## [13] "../Data/CSV/Synchrony/log/F1044G.log.slideddata.csv.csv"
## [14] "../Data/CSV/Synchrony/log/F1044H1.log.slideddata.csv.csv"
## [15] "../Data/CSV/Synchrony/log/F1044H2.log.slideddata.csv.csv"
## [16] "../Data/CSV/Synchrony/log/F1044I1.log.slideddata.csv.csv"
## [17] "../Data/CSV/Synchrony/log/F1044I2.log.slideddata.csv.csv"
## [18] "../Data/CSV/Synchrony/log/F1044L1.log.slideddata.csv.csv"
## [19] "../Data/CSV/Synchrony/log/F1044L2.log.slideddata.csv.csv"
## [20] "../Data/CSV/Synchrony/log/F1044M1.log.slideddata.csv.csv"
## [21] "../Data/CSV/Synchrony/log/F1044M2.log.slideddata.csv.csv"
## [22] "../Data/CSV/Synchrony/log/F1044N.log.slideddata.csv.csv"
## [23] "../Data/CSV/Synchrony/log/F1044O1.log.slideddata.csv.csv"
## [24] "../Data/CSV/Synchrony/log/F1044O2.log.slideddata.csv.csv"
## [25] "../Data/CSV/Synchrony/log/F1044P.log.slideddata.csv.csv"
## [26] "../Data/CSV/Synchrony/log/F1044Q1.log.slideddata.csv.csv"
## [27] "../Data/CSV/Synchrony/log/F1044Q2.log.slideddata.csv.csv"
## [28] "../Data/CSV/Synchrony/log/F1044R1.log.slideddata.csv.csv"
## [29] "../Data/CSV/Synchrony/log/F1044R2.log.slideddata.csv.csv"
## [30] "../Data/CSV/Synchrony/log/F1069A1.log.slideddata.csv.csv"
## [31] "../Data/CSV/Synchrony/log/F1069B1.log.slideddata.csv.csv"
## [32] "../Data/CSV/Synchrony/log/F1069B2.log.slideddata.csv.csv"
## [33] "../Data/CSV/Synchrony/log/F1069C1.log.slideddata.csv.csv"
## [34] "../Data/CSV/Synchrony/log/F1069D2.log.slideddata.csv.csv"
## [35] "../Data/CSV/Synchrony/log/F1073A1.log.slideddata.csv.csv"
## [36] "../Data/CSV/Synchrony/log/F1073A2.log.slideddata.csv.csv"
## [37] "../Data/CSV/Synchrony/log/F1073B1.log.slideddata.csv.csv"
## [38] "../Data/CSV/Synchrony/log/F1073B2.log.slideddata.csv.csv"
## [39] "../Data/CSV/Synchrony/log/F1101A2.log.slideddata.csv.csv"
## [40] "../Data/CSV/Synchrony/log/F1101C2.log.slideddata.csv.csv"
```

```
##  [1] "../Data/CSV/Synchrony/noLog/F1002A1.slideddata.csv.SSI.csv"
##  [2] "../Data/CSV/Synchrony/noLog/F1002A2.slideddata.csv.SSI.csv"
##  [3] "../Data/CSV/Synchrony/noLog/F1002B2.slideddata.csv.SSI.csv"
##  [4] "../Data/CSV/Synchrony/noLog/F1002C1.slideddata.csv.SSI.csv"
##  [5] "../Data/CSV/Synchrony/noLog/F1044C1.slideddata.csv.SSI.csv"
##  [6] "../Data/CSV/Synchrony/noLog/F1044C2.slideddata.csv.SSI.csv"
##  [7] "../Data/CSV/Synchrony/noLog/F1044D1.slideddata.csv.SSI.csv"
##  [8] "../Data/CSV/Synchrony/noLog/F1044D2.slideddata.csv.SSI.csv"
##  [9] "../Data/CSV/Synchrony/noLog/F1044E1.slideddata.csv.SSI.csv"
## [10] "../Data/CSV/Synchrony/noLog/F1044E2.slideddata.csv.SSI.csv"
## [11] "../Data/CSV/Synchrony/noLog/F1044F1.slideddata.csv.SSI.csv"
## [12] "../Data/CSV/Synchrony/noLog/F1044F2.slideddata.csv.SSI.csv"
## [13] "../Data/CSV/Synchrony/noLog/F1044G.slideddata.csv.SSI.csv"
## [14] "../Data/CSV/Synchrony/noLog/F1044H1.slideddata.csv.SSI.csv"
## [15] "../Data/CSV/Synchrony/noLog/F1044H2.slideddata.csv.SSI.csv"
## [16] "../Data/CSV/Synchrony/noLog/F1044I1.slideddata.csv.SSI.csv"
## [17] "../Data/CSV/Synchrony/noLog/F1044I2.slideddata.csv.SSI.csv"
## [18] "../Data/CSV/Synchrony/noLog/F1044L1.slideddata.csv.SSI.csv"
## [19] "../Data/CSV/Synchrony/noLog/F1044L2.slideddata.csv.SSI.csv"
## [20] "../Data/CSV/Synchrony/noLog/F1044M1.slideddata.csv.SSI.csv"
## [21] "../Data/CSV/Synchrony/noLog/F1044M2.slideddata.csv.SSI.csv"
## [22] "../Data/CSV/Synchrony/noLog/F1044N.slideddata.csv.SSI.csv"
## [23] "../Data/CSV/Synchrony/noLog/F1044O1.slideddata.csv.SSI.csv"
## [24] "../Data/CSV/Synchrony/noLog/F1044O2.slideddata.csv.SSI.csv"
## [25] "../Data/CSV/Synchrony/noLog/F1044P.slideddata.csv.SSI.csv"
## [26] "../Data/CSV/Synchrony/noLog/F1044Q1.slideddata.csv.SSI.csv"
## [27] "../Data/CSV/Synchrony/noLog/F1044Q2.slideddata.csv.SSI.csv"
## [28] "../Data/CSV/Synchrony/noLog/F1044R1.slideddata.csv.SSI.csv"
## [29] "../Data/CSV/Synchrony/noLog/F1044R2.slideddata.csv.SSI.csv"
## [30] "../Data/CSV/Synchrony/noLog/F1069A1.slideddata.csv.SSI.csv"
## [31] "../Data/CSV/Synchrony/noLog/F1069B1.slideddata.csv.SSI.csv"
## [32] "../Data/CSV/Synchrony/noLog/F1069B2.slideddata.csv.SSI.csv"
## [33] "../Data/CSV/Synchrony/noLog/F1069C1.slideddata.csv.SSI.csv"
## [34] "../Data/CSV/Synchrony/noLog/F1069D2.slideddata.csv.SSI.csv"
## [35] "../Data/CSV/Synchrony/noLog/F1073A1.slideddata.csv.SSI.csv"
## [36] "../Data/CSV/Synchrony/noLog/F1073A2.slideddata.csv.SSI.csv"
```

Description of SSI data frame

```
str(SSIdataFrame)
```

```
## 'data.frame':    1558 obs. of  14 variables:
##  $ X          : int  0 1 2 3 4 5 6 7 8 9 ...
##  $ Interval   : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ Time_min   : num  0 0.167 0.333 0.5 0.667 ...
##  $ video      : Factor w/ 36 levels "F1002A1","F1002A2",..: 1 1 1 1 1 1 1 1 1 1 ...
##  $ SSI_fa_mo  : num  3.29e-03 2.81e-02 6.28e-06 1.91e-03 3.42e-04 ...
##  $ SSI_fa_mo_th: num  0.06552 0.05668 0.00475 0.01931 0.00603 ...
##  $ SSI_fa_th  : num  0.149776 0.087342 0.000483 0.03006 0.003311 ...
##  $ SSI_mo_th  : num  0.00132 0.02688 0.01082 0.01481 0.01079 ...
##  $ SSI_pa_th  : num  NA NA NA NA NA NA NA NA NA NA ...
##  $ SSI_mo_pa  : num  NA NA NA NA NA NA NA NA NA NA ...
##  $ SSI_mo_pa_th: num  NA NA NA NA NA NA NA NA NA NA ...
##  $ SSI_fa_pa  : num  NA NA NA NA NA NA NA NA NA NA ...
##  $ SSI_fa_mo_pa: num  NA NA NA NA NA NA NA NA NA NA ...
##  $ SSI_fa_pa_th: num  NA NA NA NA NA NA NA NA NA NA ...
```

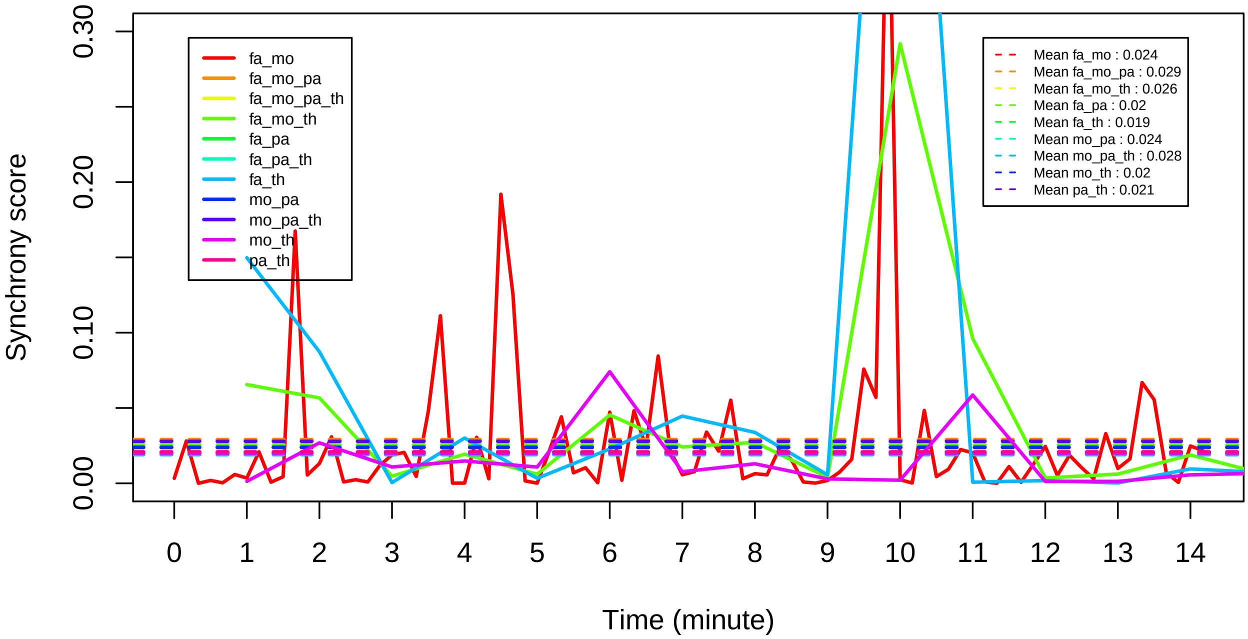
Synchrony scores for each dyad, triad and for the whole group

In legend, mean for all the video.

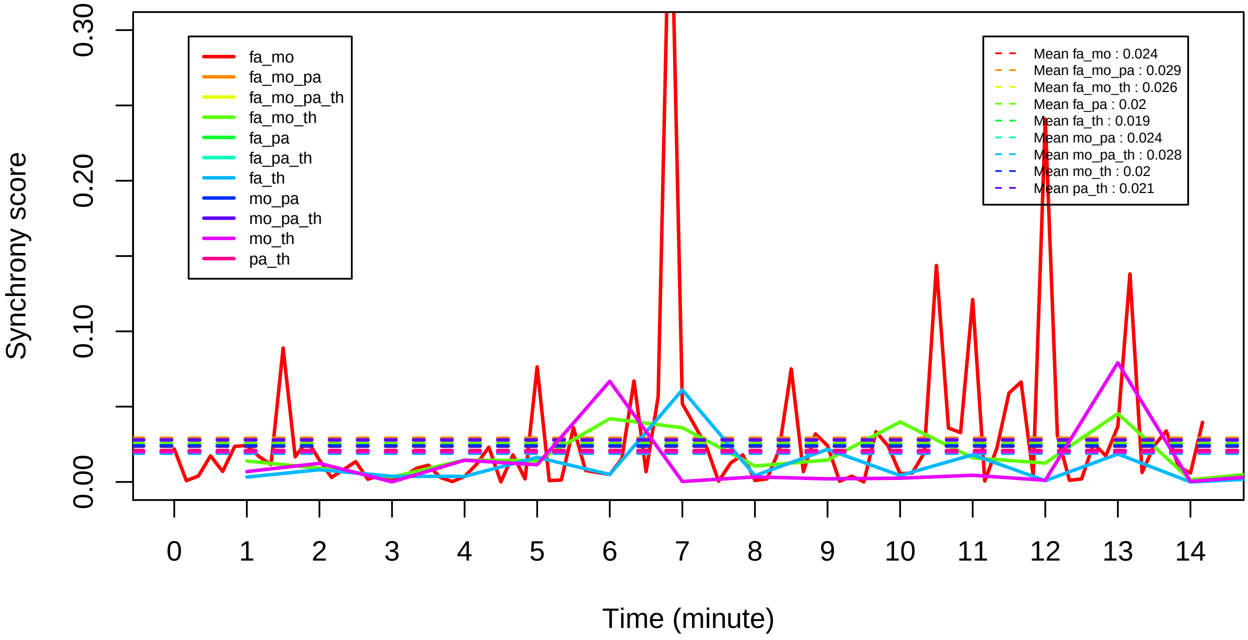
```
for (i in unique(SSIdataFrame$video))
      {par(mar=c(4,4,4,3), mfrow=c(1,1))
      plot(SSIdataFrame[which(SSIdataFrame$video==i),]$Time_min,
           SSIdataFrame[which(SSIdataFrame$video==i),]$SSI_fa_mo,
           type="l", ylim=c(0, 0.3), col=rainbow(4)[1],
           main=paste("Synchrony scores for each dyad and for \n the whole group in", i, "video"),
           xlab = "Time (minute)", ylab="Synchrony score", lwd=2,
xaxp=c(0,length(SSIdataFrame$Time_min), length(SSIdataFrame$Time_min)))
      abline(h=mean(SSIdataFrame$SSI_fa_mo, na.rm=TRUE), col=rainbow(11)[1], lwd=2, lty=2)

      lines(SSIdataFrame[which(SSIdataFrame$video==i),]$SSI_fa_mo_pa, col=rainbow(11)[2], lwd=2)
      abline(h= mean(SSIdataFrame$SSI_fa_mo_pa, na.rm=TRUE), col=rainbow(11)[2], lwd=2, lty=2)

#      lines(SSIdataFrame[which(SSIdataFrame$video==i),]$SSI_fa_mo_pa_th, col=rainbow(11)[3], lwd=2)
#      abline(h= mean(SSIdataFrame$SSI_fa_mo_pa_th, na.rm=TRUE), col=rainbow(11)[3], lwd=2, lty=2)

      lines(SSIdataFrame[which(SSIdataFrame$video==i),]$SSI_fa_mo_th, col=rainbow(11)[4], lwd=2)
      abline(h= mean(SSIdataFrame$SSI_fa_mo_th, na.rm=TRUE), col=rainbow(11)[4], lwd=2, lty=2)

      lines(SSIdataFrame[which(SSIdataFrame$video==i),]$SSI_fa_pa, col=rainbow(11)[5], lwd=2)
      abline(h= mean(SSIdataFrame$SSI_fa_pa, na.rm=TRUE), col=rainbow(11)[5], lwd=2, lty=2)

#      lines(SSIdataFrame[which(SSIdataFrame$video==i),]$SSI_fa_pa_th, col=rainbow(11)[6], lwd=2)
#      abline(h= mean(SSIdataFrame$SSI_fa_pa_th, na.rm=TRUE), col=rainbow(11)[6], lwd=2, lty=2)

lines(SSIdataFrame[which(SSIdataFrame$video==i),]$SSI_fa_th, col=rainbow(11)[7], lwd=2)
abline(h= mean(SSIdataFrame$SSI_fa_th, na.rm=TRUE), col=rainbow(11)[7], lwd=2, lty=2)

lines(SSIdataFrame[which(SSIdataFrame$video==i),]$SSI_mo_pa, col=rainbow(11)[8], lwd=2)
```

```r
abline(h= mean(SSIdataFrame$SSI_mo_pa, na.rm=TRUE), col=rainbow(11)[8], lwd=2, lty=2)

lines(SSIdataFrame[which(SSIdataFrame$video==i),]$SSI_mo_pa_th, col=rainbow(11)[9], lwd=2)
abline(h= mean(SSIdataFrame$SSI_mo_pa_th, na.rm=TRUE), col=rainbow(11)[9], lwd=2, lty=2)
lines(SSIdataFrame[which(SSIdataFrame$video==i),]$SSI_mo_th, col=rainbow(11)[10], lwd=2)
abline(h= mean(SSIdataFrame$SSI_mo_th, na.rm=TRUE), col=rainbow(11)[10], lwd=2, lty=2)

      lines(SSIdataFrame[which(SSIdataFrame$video==i),]$SSI_pa_th, col=rainbow(11)[11], lwd=2)
      abline(h= mean(SSIdataFrame$SSI_pa_th, na.rm=TRUE), col=rainbow(11)[11], lwd=2, lty=2)

legend("topleft", inset=.05, c("fa_mo", "fa_mo_pa", "fa_mo_pa_th",
"fa_mo_th", "fa_pa", "fa_pa_th", "fa_th",
"mo_pa", "mo_pa_th", "mo_th", "pa_th"),
col=rainbow(11), cex=0.6, lwd=2)

legend("topright", inset=.05, c(paste ("Mean fa_mo :",
                                       round(mean(SSIdataFrame$SSI_fa_mo, na.rm=TRUE),3)),
      paste ("Mean fa_mo_pa :", round(mean(SSIdataFrame$SSI_fa_mo_pa,na.rm=TRUE),3)),
#      paste ("Mean fa_mo_pa_th :", #round(mean(SSIdataFrame$SSI_fa_mo_pa_th),3)),
      paste ("Mean fa_mo_th :", round(mean(SSIdataFrame$SSI_fa_mo_th,na.rm=TRUE),3)),
      paste ("Mean fa_pa :", round(mean(SSIdataFrame$SSI_fa_pa, na.rm=TRUE),3)),
#      paste ("Mean fa_pa_th :", round(mean(SSIdataFrame$SSI_fa_pa_th,na.rm=TRUE),3)),
      paste ("Mean fa_th :", round(mean(SSIdataFrame$SSI_fa_th,na.rm=TRUE),3)),
      paste ("Mean mo_pa :", round(mean(SSIdataFrame$SSI_mo_pa,na.rm=TRUE),3)),
      paste ("Mean mo_pa_th :", round(mean(SSIdataFrame$SSI_mo_pa_th,na.rm=TRUE),3)),
      paste ("Mean mo_th :", round(mean(SSIdataFrame$SSI_mo_th,na.rm=TRUE),3)),
      paste ("Mean pa_th :", round(mean(SSIdataFrame$SSI_pa_th,na.rm=TRUE),3))),
col=rainbow(11), cex=0.5, lty=2, lwd=1)}
```

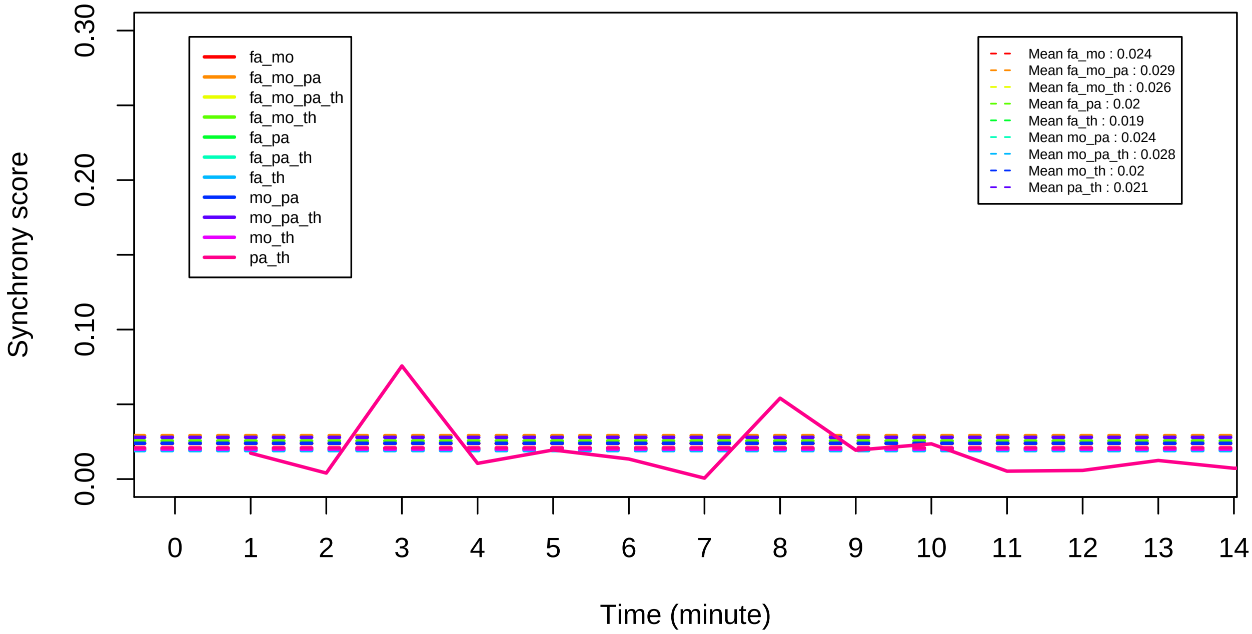
Synchrony scores for each dyad and for
the whole group in F1002A1 video



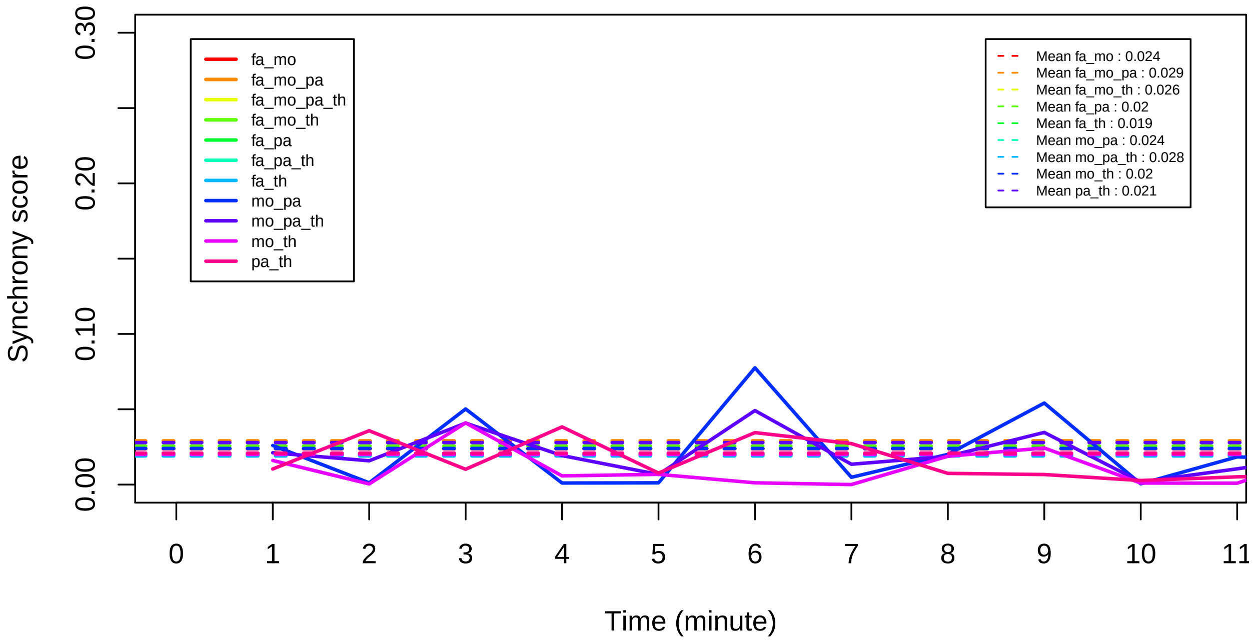
Synchrony scores for each dyad and for
the whole group in F1002A2 video

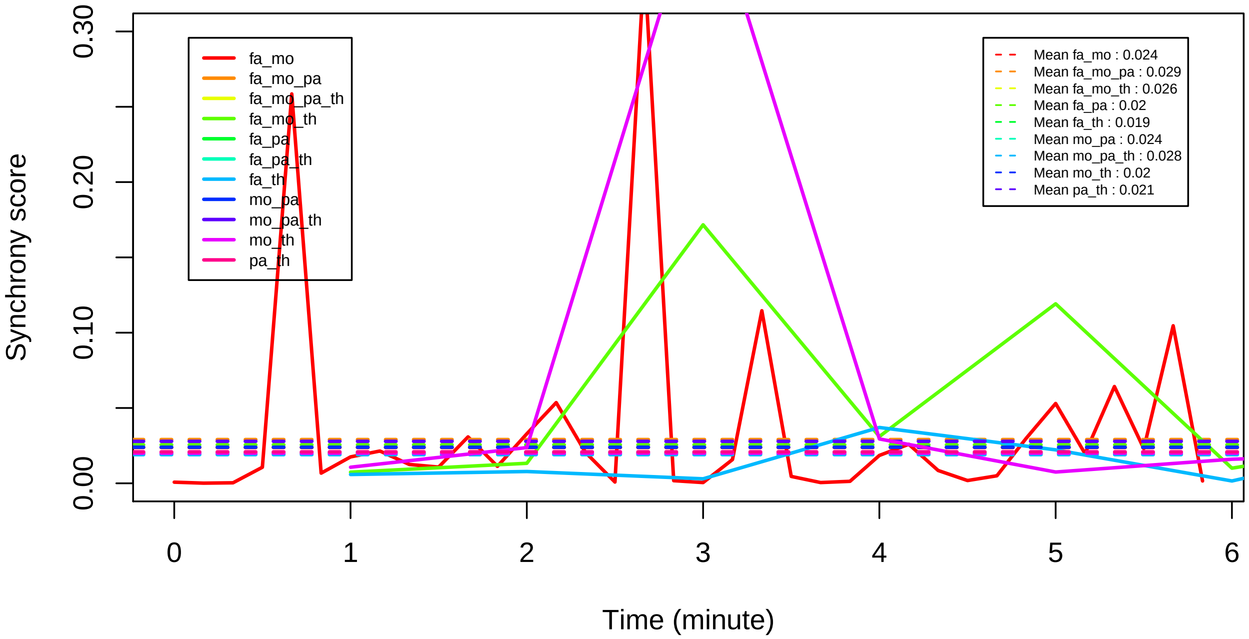


Synchrony scores for each dyad and for the whole group in F1002B2 video

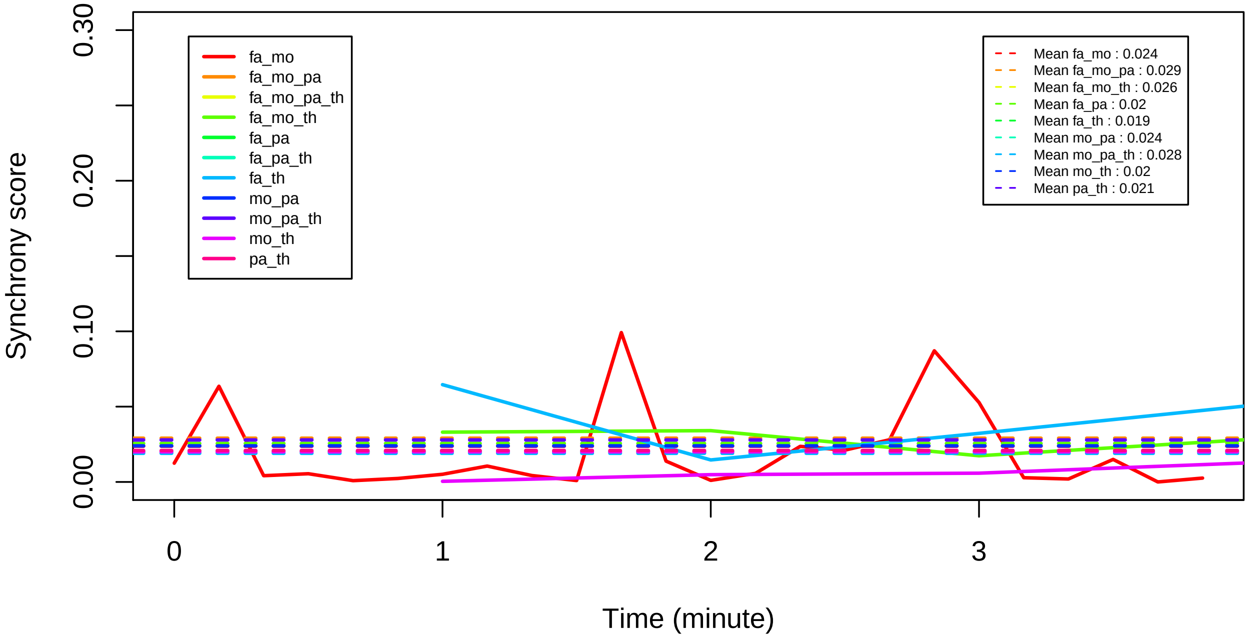


Synchrony scores for each dyad and for the whole group in F1002C1 video

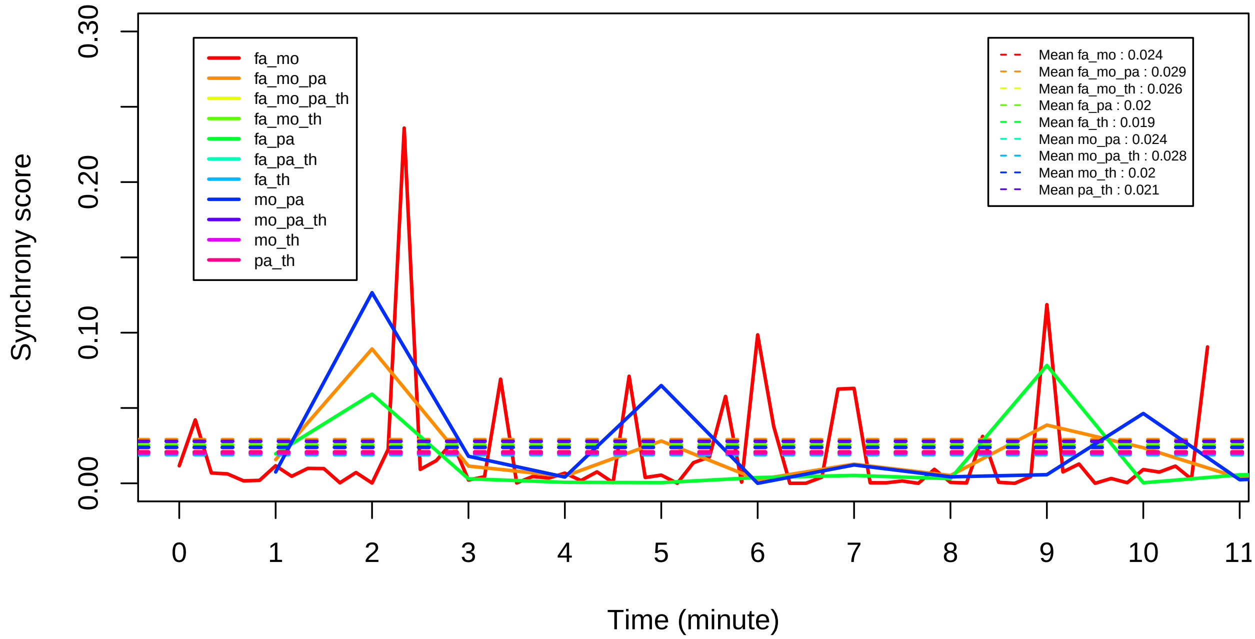




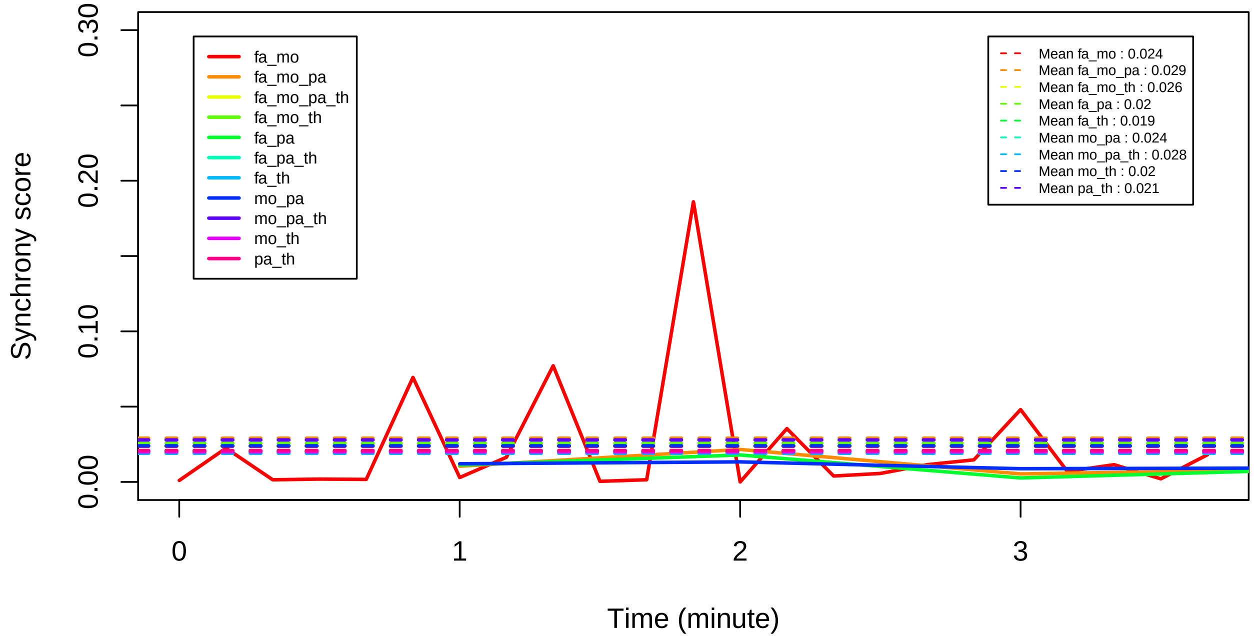
Synchrony scores for each dyad and for the whole group in F1044C1 video



Synchrony scores for each dyad and for the whole group in F1044C2 video

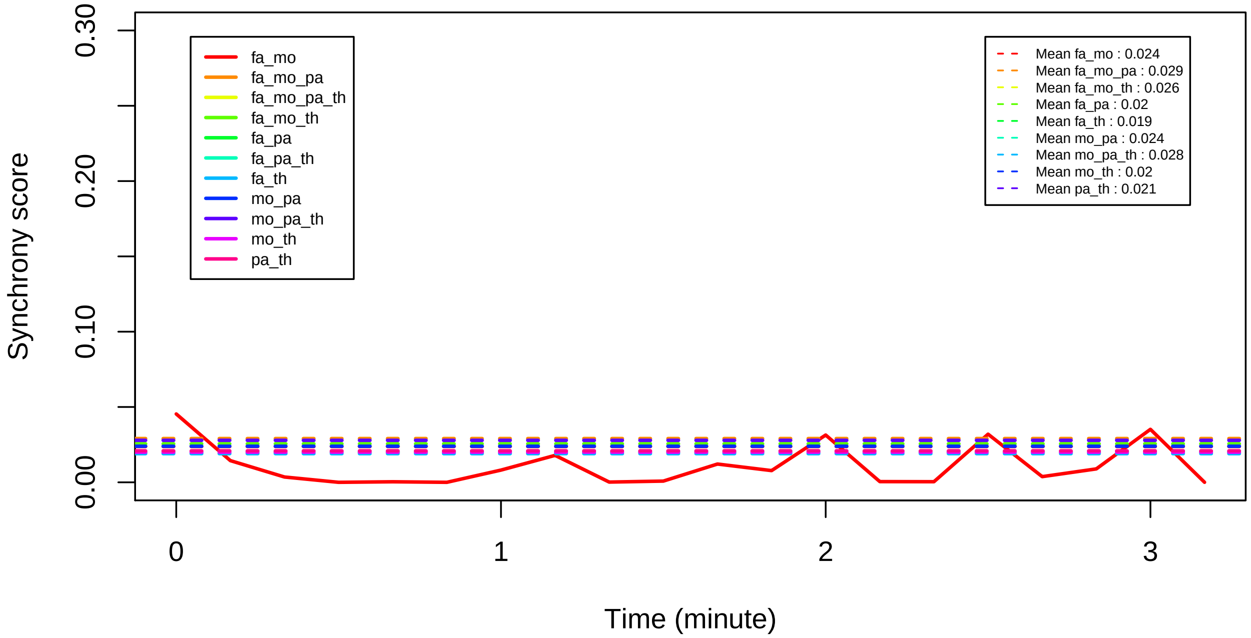


Synchrony scores for each dyad and for the whole group in F1044D1 video

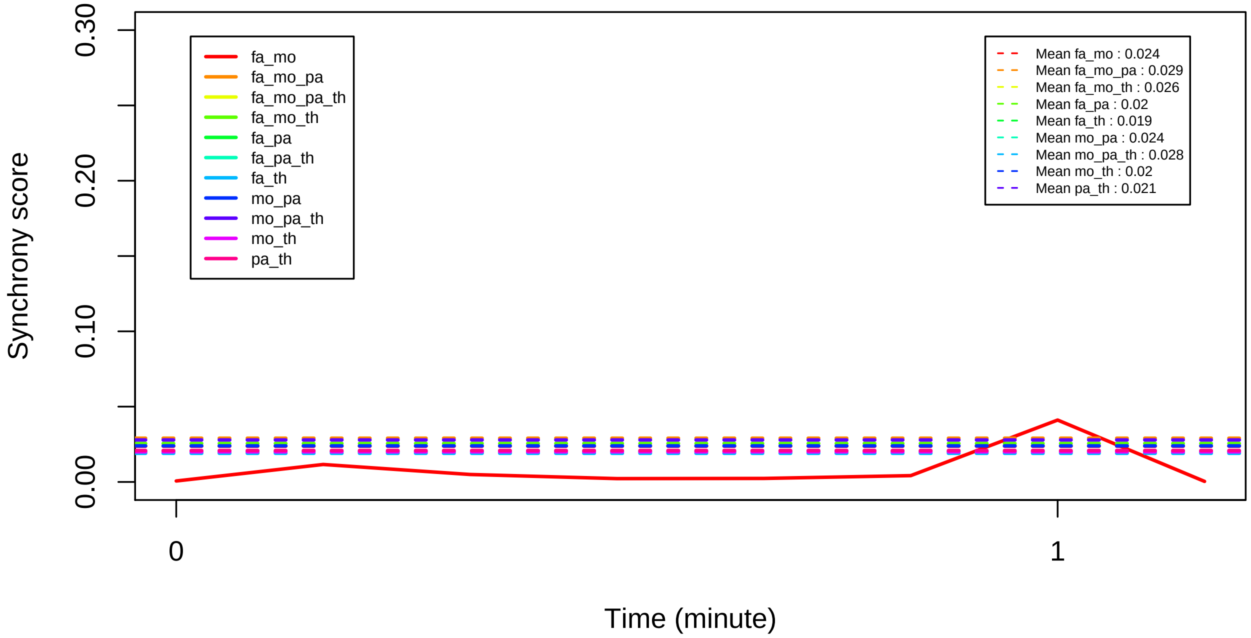


Synchrony scores for each dyad and for the whole group in F1044D2 video

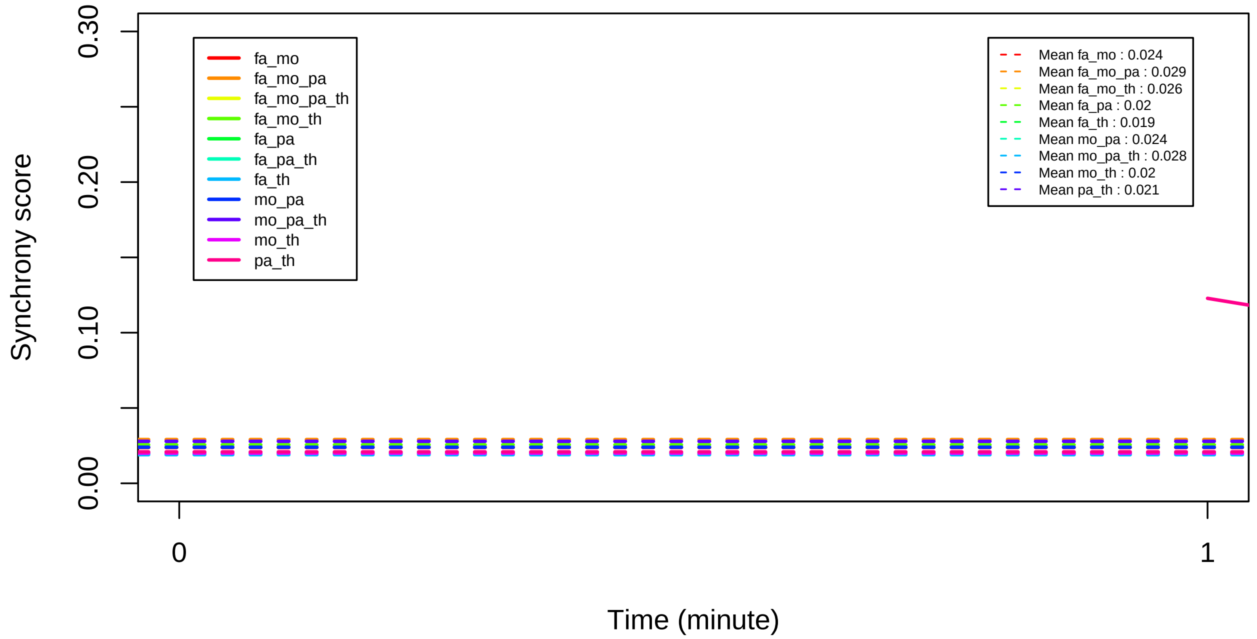
Synchrony scores for each dyad and for the whole group in F1044E1 video



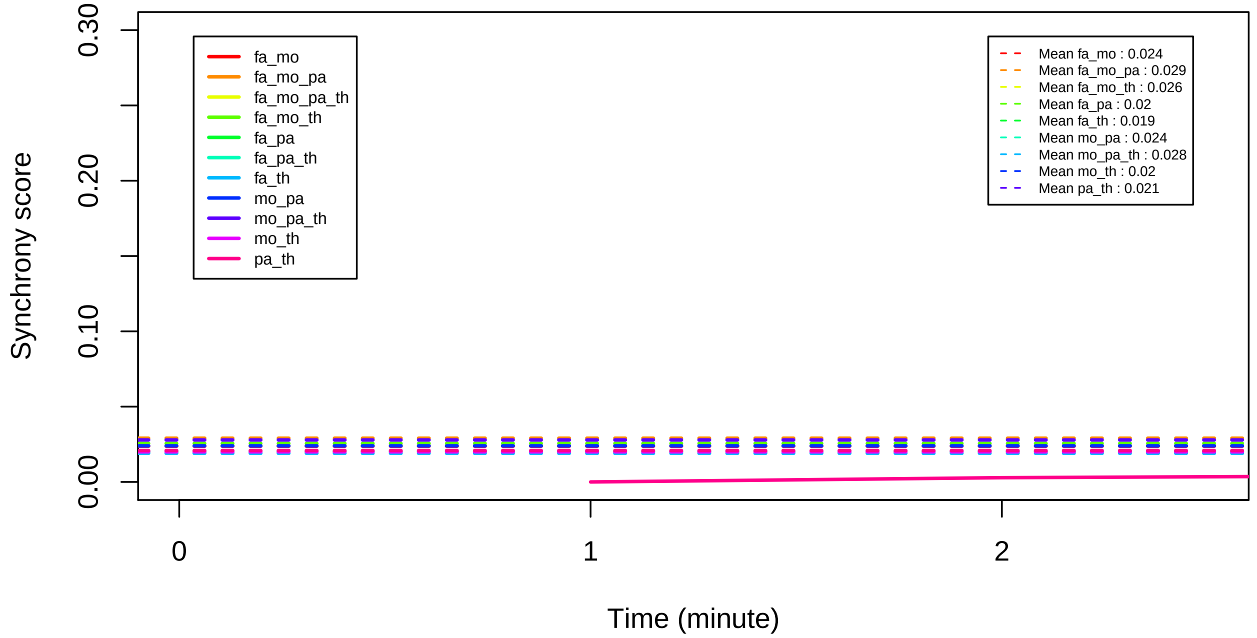
Synchrony scores for each dyad and for the whole group in F1044E2 video



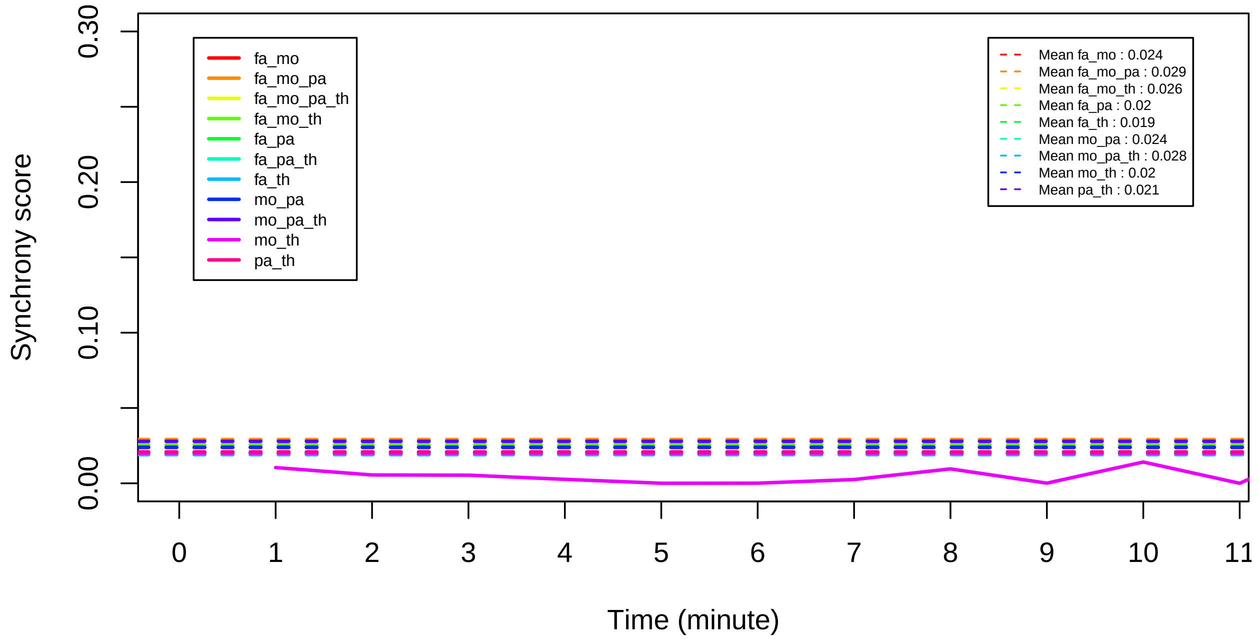
Synchrony scores for each dyad and for the whole group in F1044F1 video



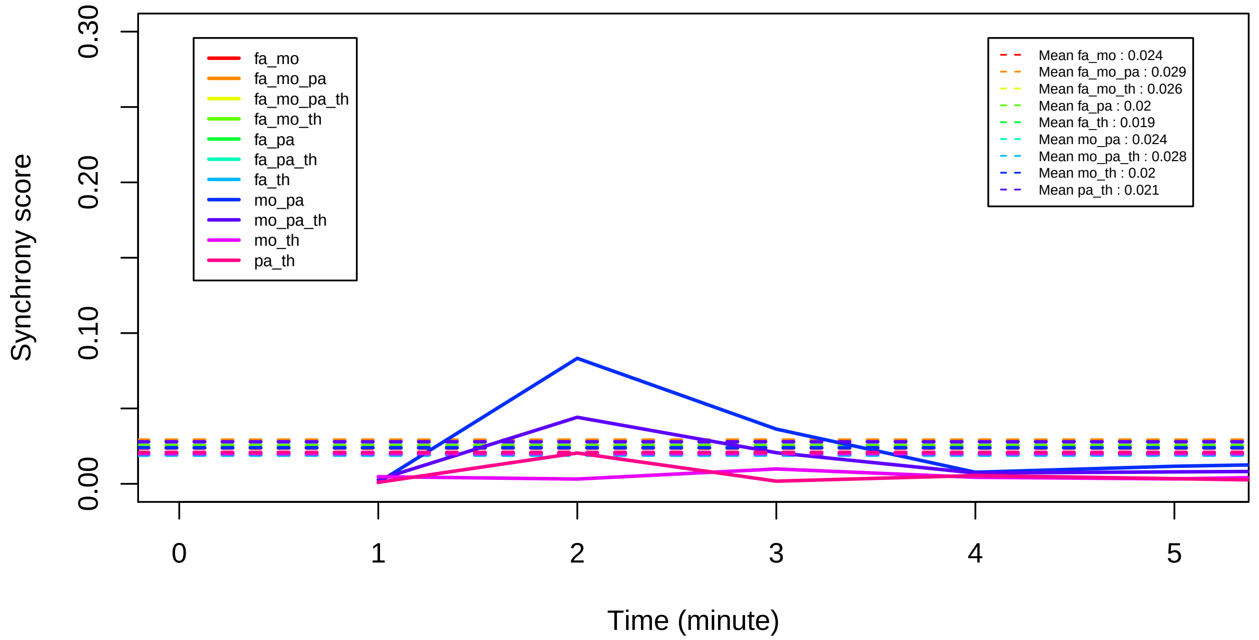
Synchrony scores for each dyad and for the whole group in F1044F2 video

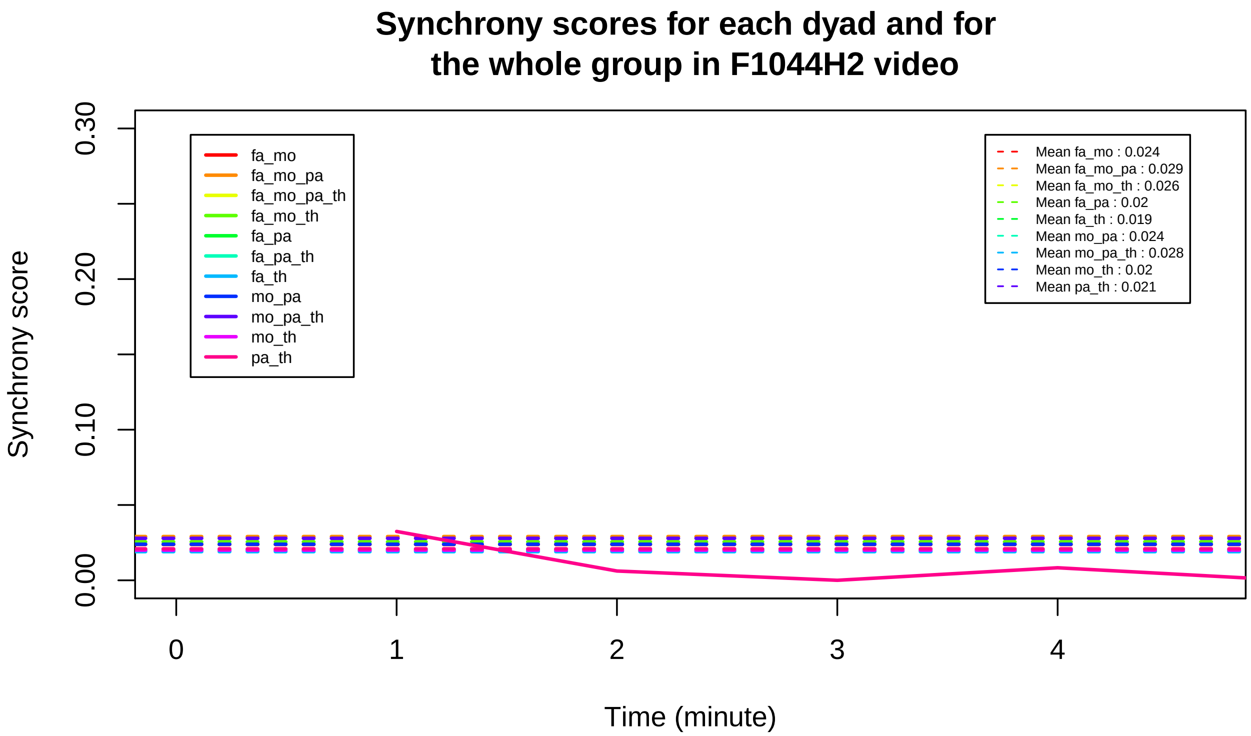


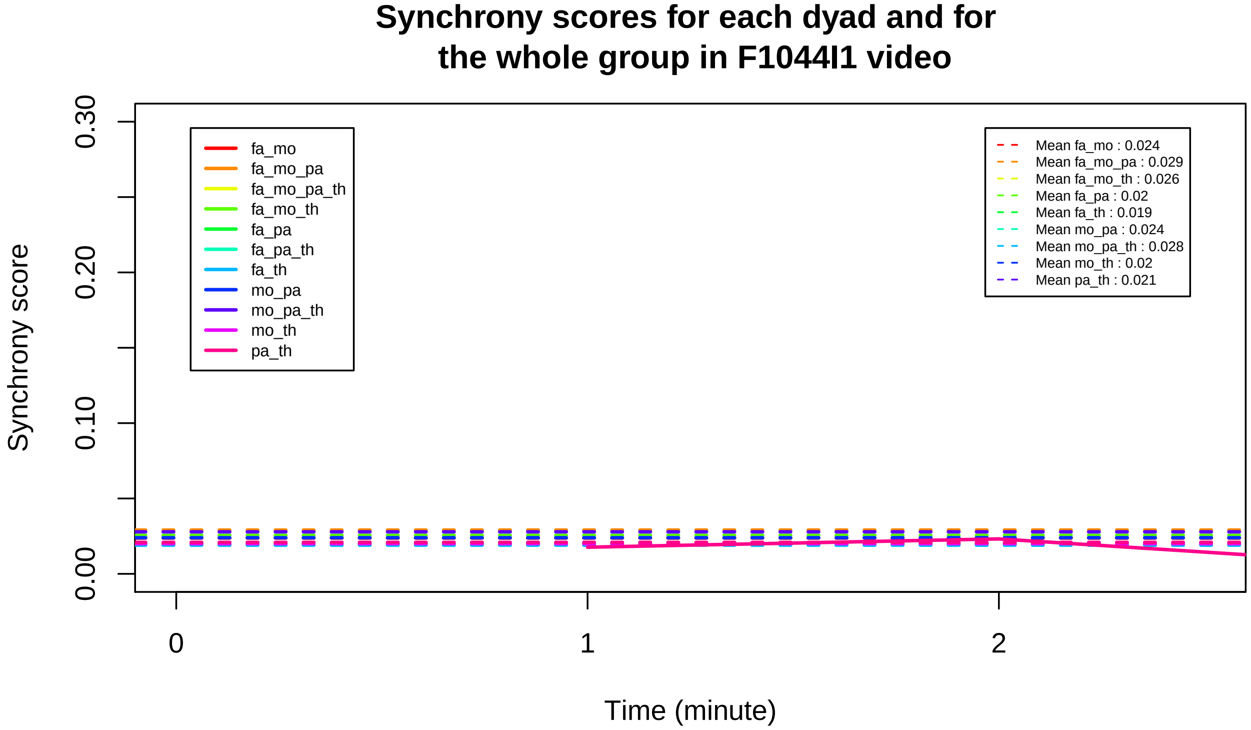
Synchrony scores for each dyad and for the whole group in F1044G video



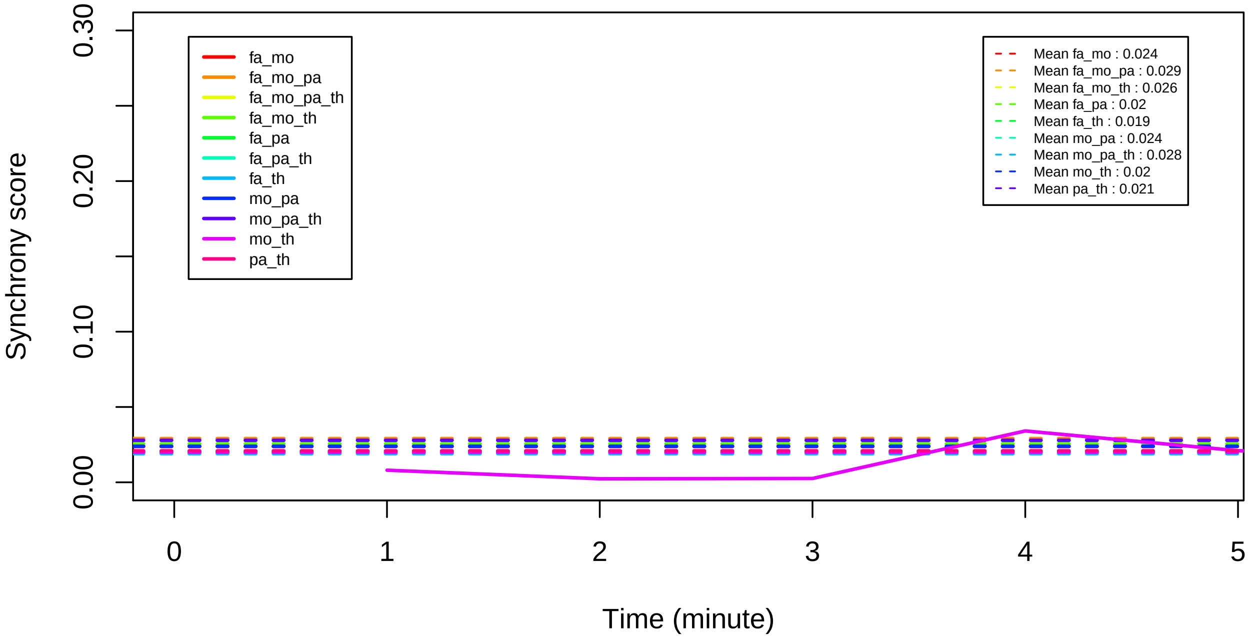
Synchrony scores for each dyad and for the whole group in F1044H1 video



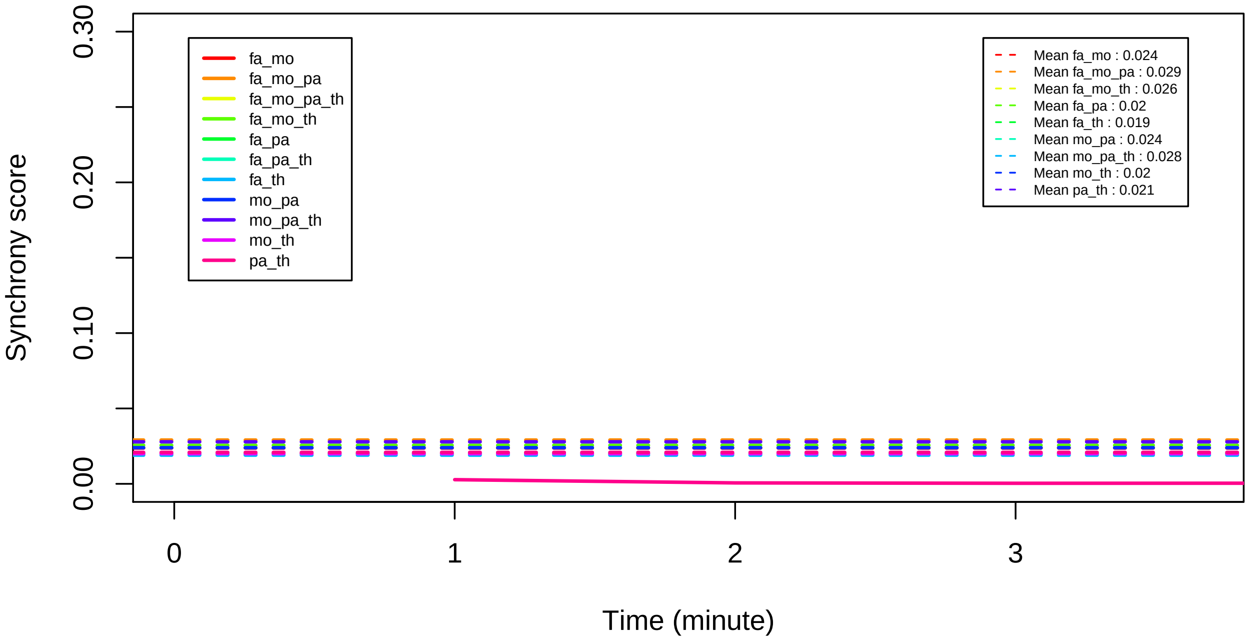

Synchrony scores for each dyad and for the whole group in F1044H2 video
Synchrony score
0.00
0.10
0.20
0.30
0
1
2
3
4
Time (minute)
fa_mo
fa_mo_pa
fa_mo_pa_th
fa_mo_th
fa_pa
fa_pa_th
fa_th
mo_pa
mo_pa_th
mo_th
pa_th
Mean fa_mo : 0.024
Mean fa_mo_pa : 0.029
Mean fa_mo_th : 0.026
Mean fa_pa : 0.02
Mean fa_th : 0.019
Mean mo_pa : 0.024
Mean mo_pa_th : 0.028
Mean mo_th : 0.02
Mean pa_th : 0.021

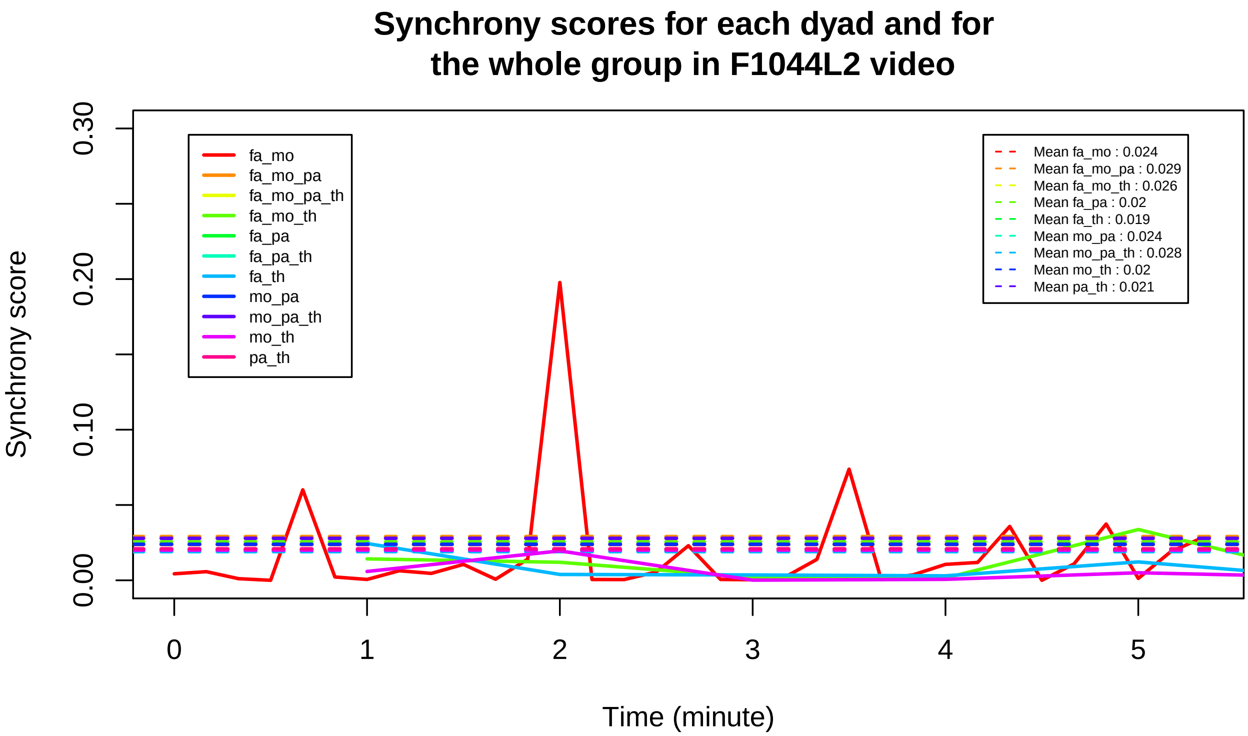

Synchrony scores for each dyad and for the whole group in F1044I1 video
Synchrony score
0.00
0.10
0.20
0.30
0
1
2
Time (minute)
fa_mo
fa_mo_pa
fa_mo_pa_th
fa_mo_th
fa_pa
fa_pa_th
fa_th
mo_pa
mo_pa_th
mo_th
pa_th
Mean fa_mo : 0.024
Mean fa_mo_pa : 0.029
Mean fa_mo_th : 0.026
Mean fa_pa : 0.02
Mean fa_th : 0.019
Mean mo_pa : 0.024
Mean mo_pa_th : 0.028
Mean mo_th : 0.02
Mean pa_th : 0.021

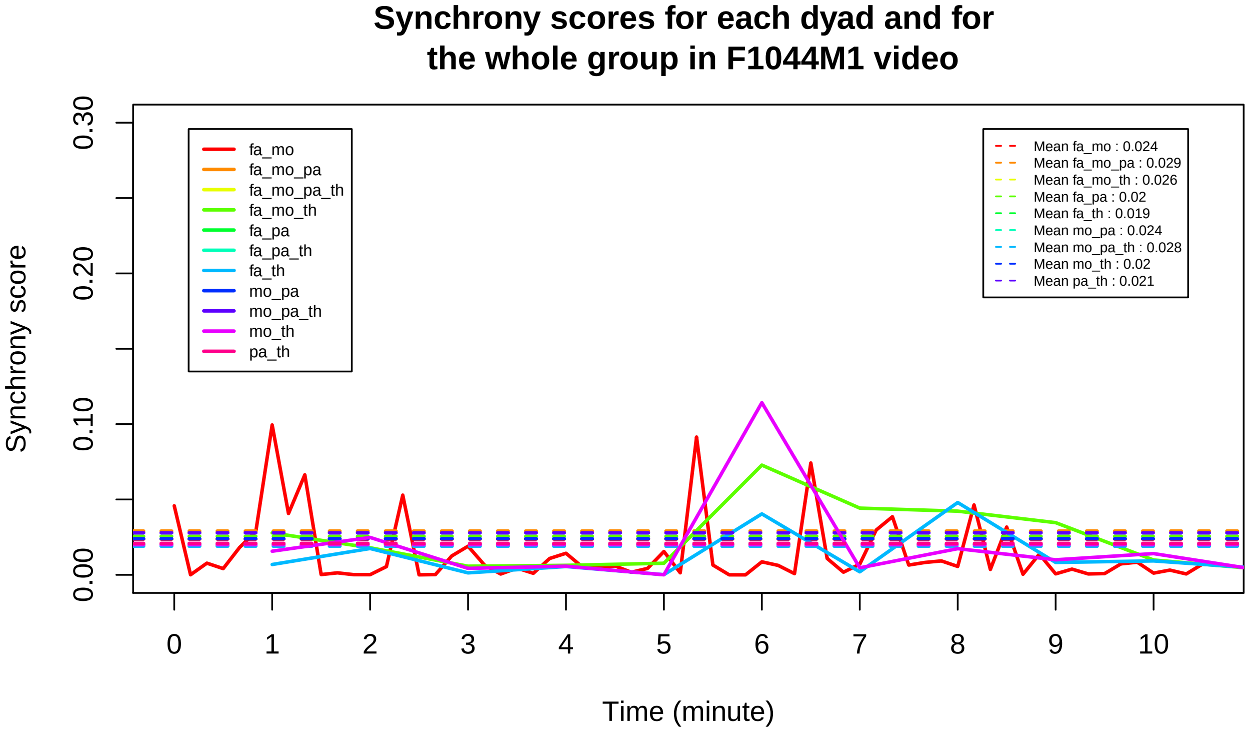
Synchrony scores for each dyad and for the whole group in F1044I2 video

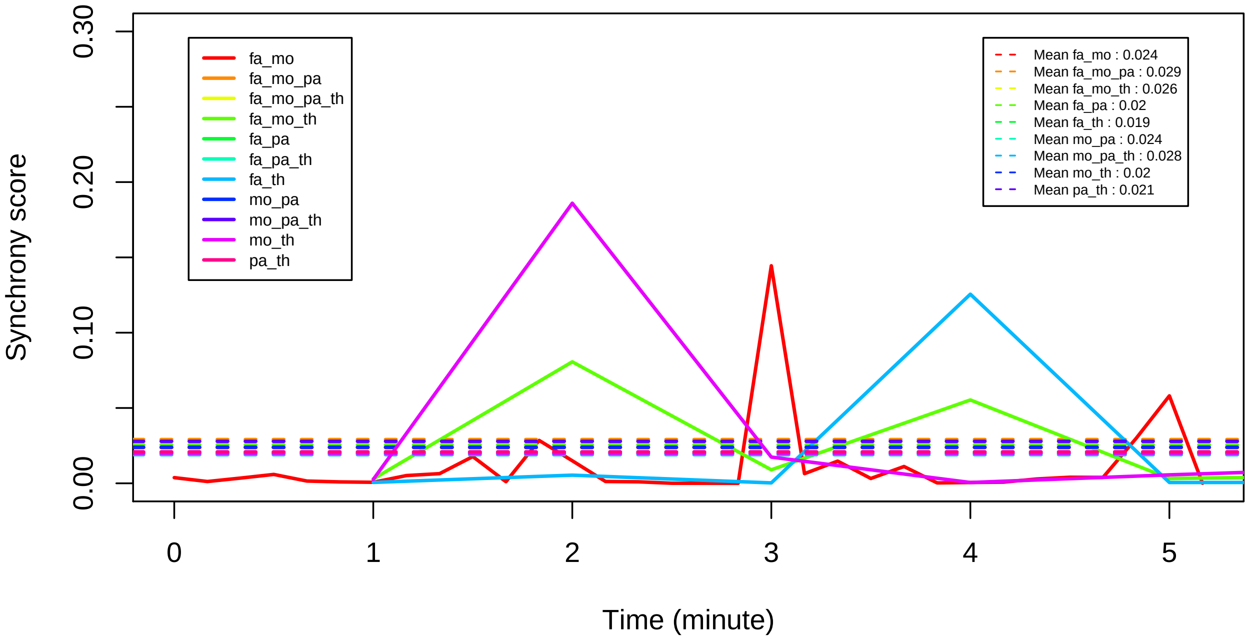


Synchrony scores for each dyad and for the whole group in F1044L1 video

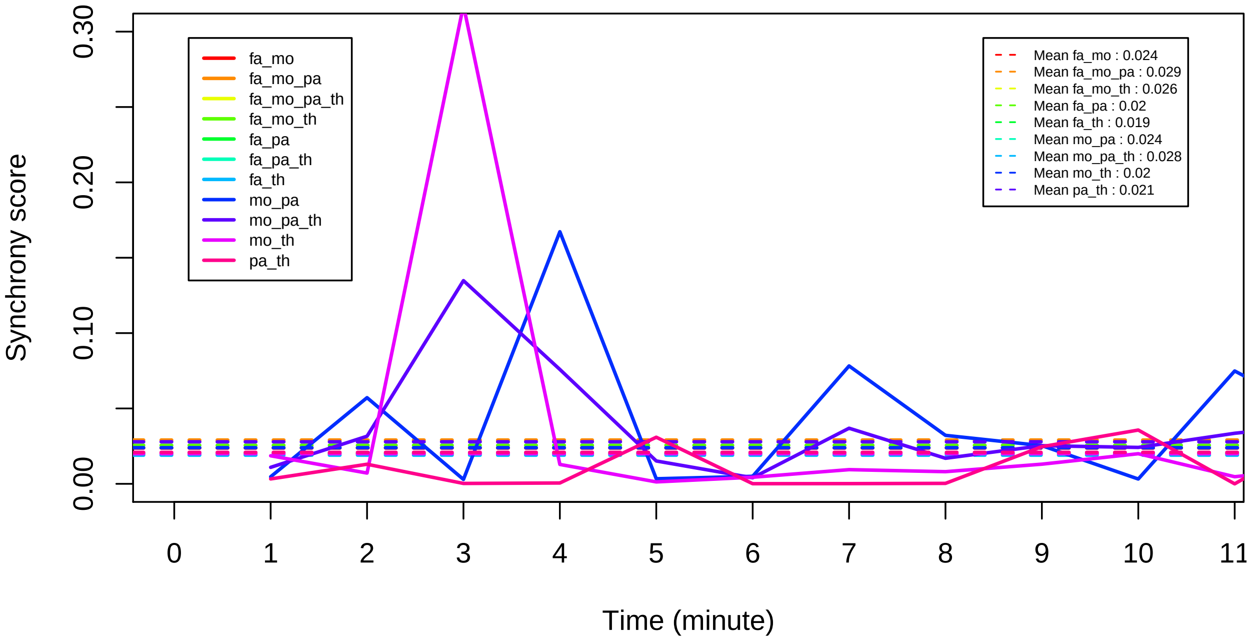



Synchrony scores for each dyad and for the whole group in F1044L2 video

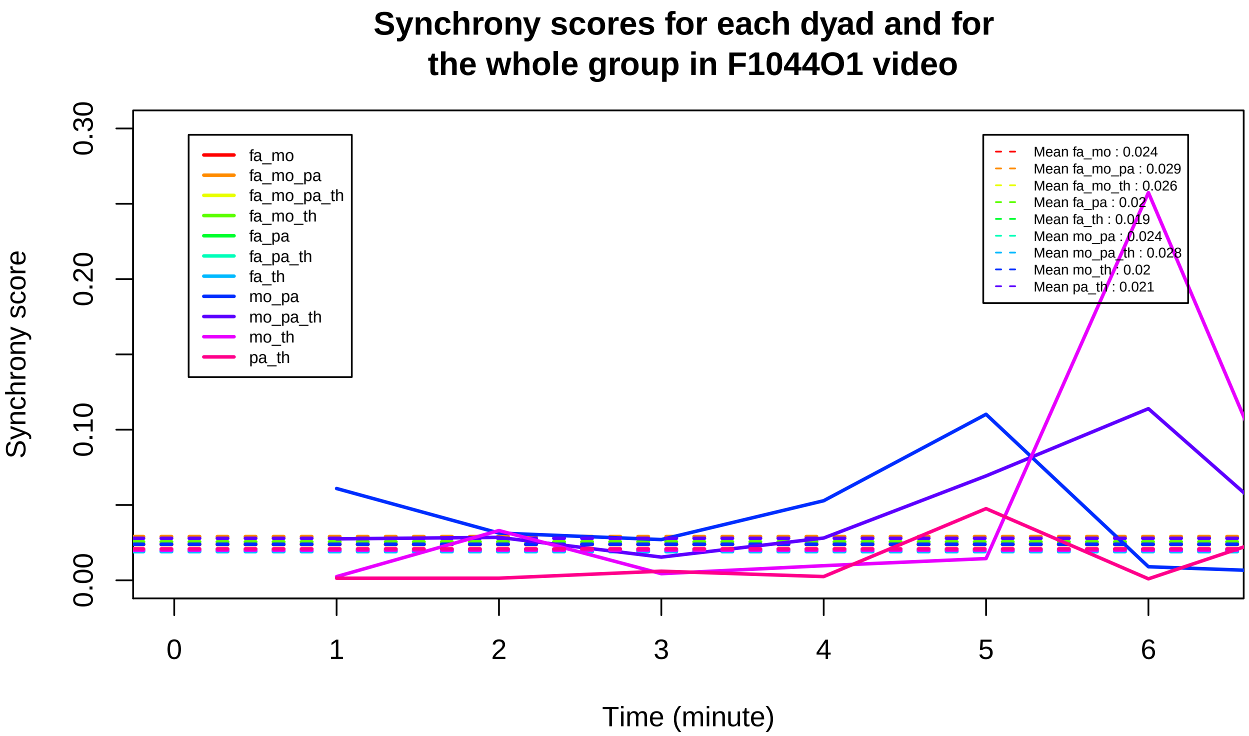

Synchrony scores for each dyad and for the whole group in F1044M1 video

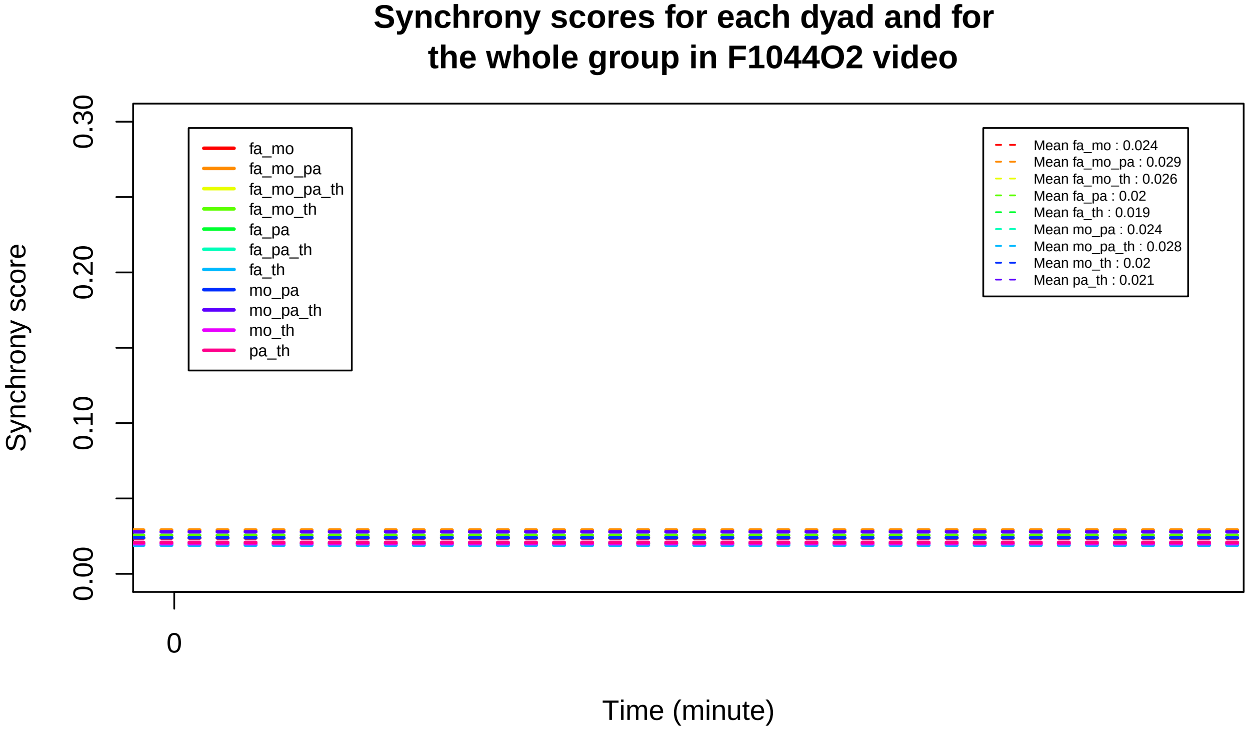


Synchrony scores for each dyad and for the whole group in F1044M2 video

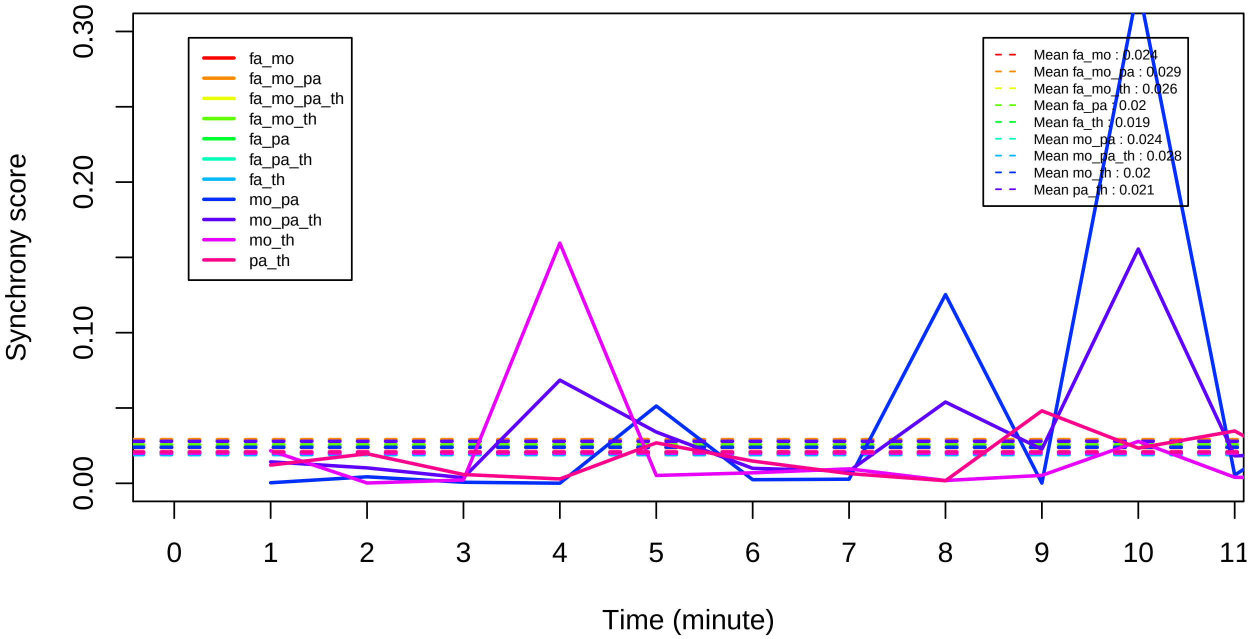


Synchrony scores for each dyad and for the whole group in F1044N video

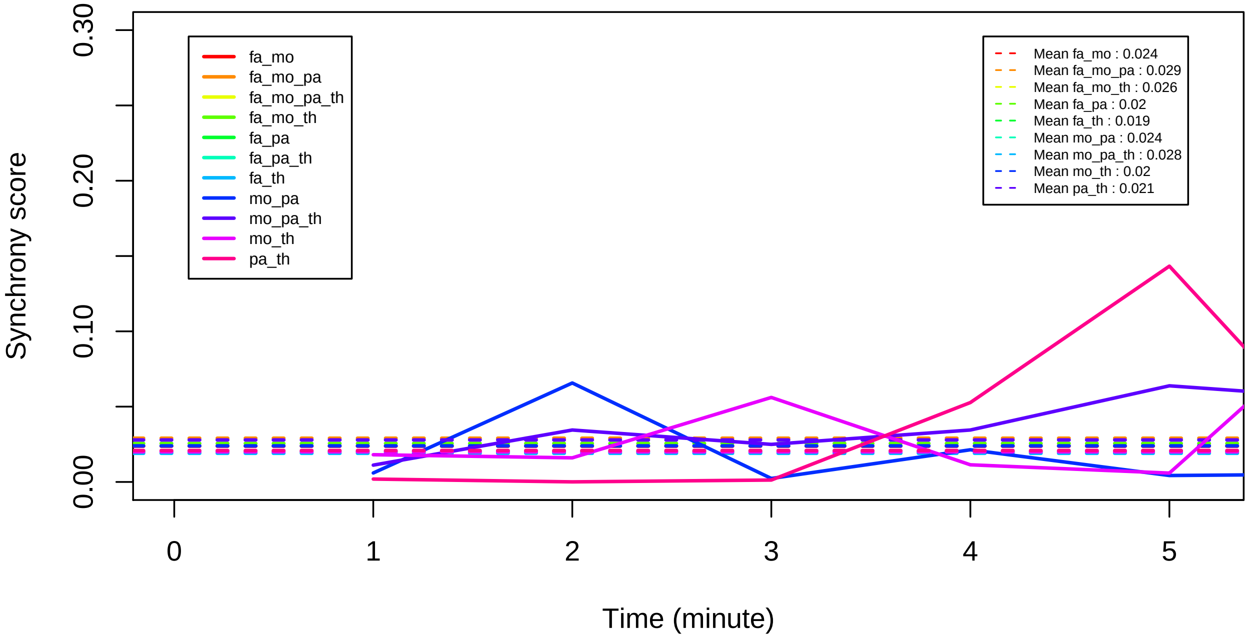

Synchrony scores for each dyad and for
the whole group in F1044O1 video
Synchrony score
0.00
0.10
0.20
0.30
Time (minute)
0
1
2
3
4
5
6
fa_mo
fa_mo_pa
fa_mo_pa_th
fa_mo_th
fa_pa
fa_pa_th
fa_th
mo_pa
mo_pa_th
mo_th
pa_th
Mean fa_mo : 0.024
Mean fa_mo_pa : 0.029
Mean fa_mo_th : 0.026
Mean fa_pa : 0.02
Mean fa_th : 0.019
Mean mo_pa : 0.024
Mean mo_pa_th : 0.028
Mean mo_th : 0.02
Mean pa_th : 0.021


Synchrony scores for each dyad and for
the whole group in F1044O2 video
Synchrony score
0.00
0.10
0.20
0.30
Time (minute)
0
fa_mo
fa_mo_pa
fa_mo_pa_th
fa_mo_th
fa_pa
fa_pa_th
fa_th
mo_pa
mo_pa_th
mo_th
pa_th
Mean fa_mo : 0.024
Mean fa_mo_pa : 0.029
Mean fa_mo_th : 0.026
Mean fa_pa : 0.02
Mean fa_th : 0.019
Mean mo_pa : 0.024
Mean mo_pa_th : 0.028
Mean mo_th : 0.02
Mean pa_th : 0.021

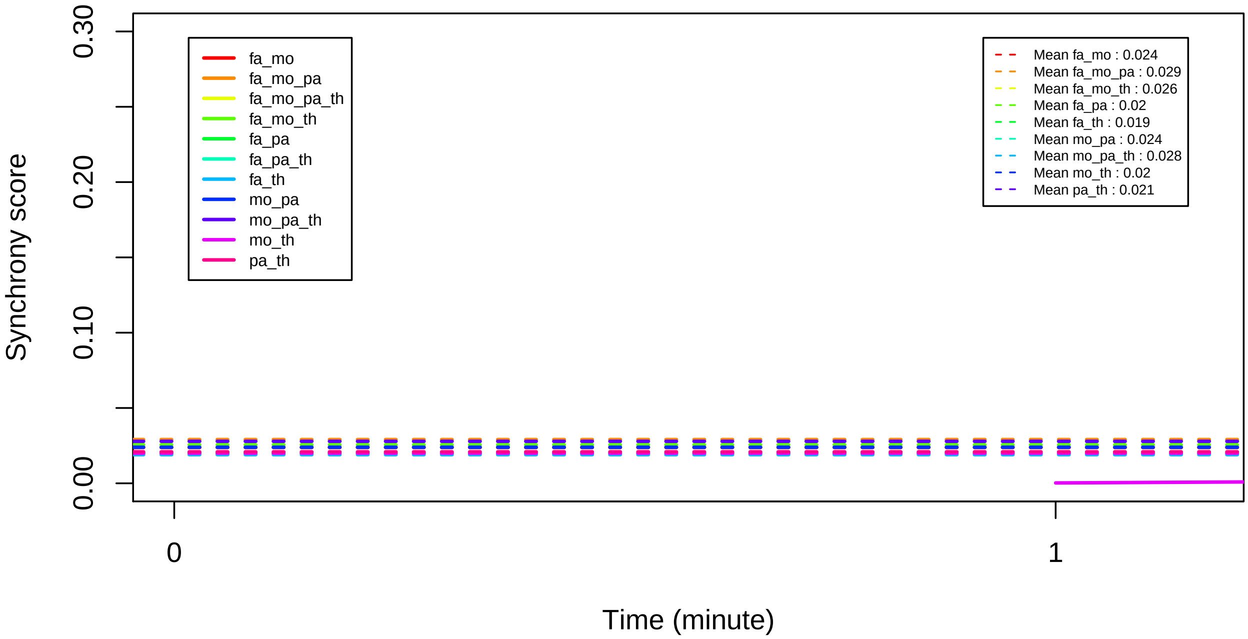
Synchrony scores for each dyad and for the whole group in F1044P video



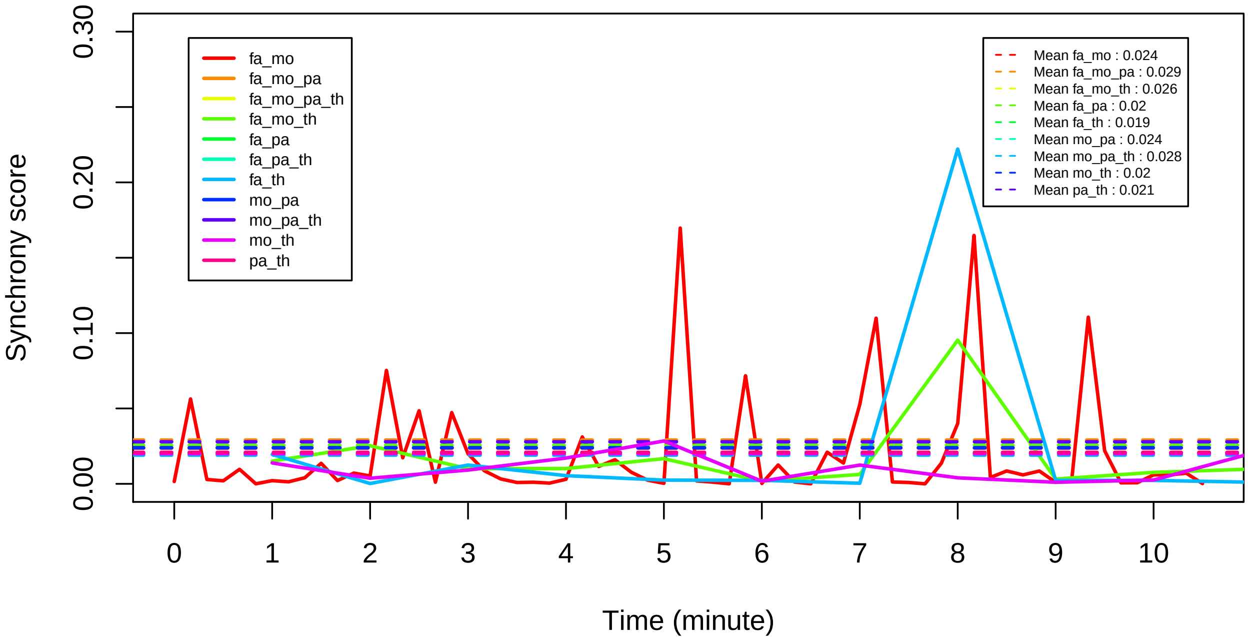
Synchrony scores for each dyad and for the whole group in F1044Q1 video

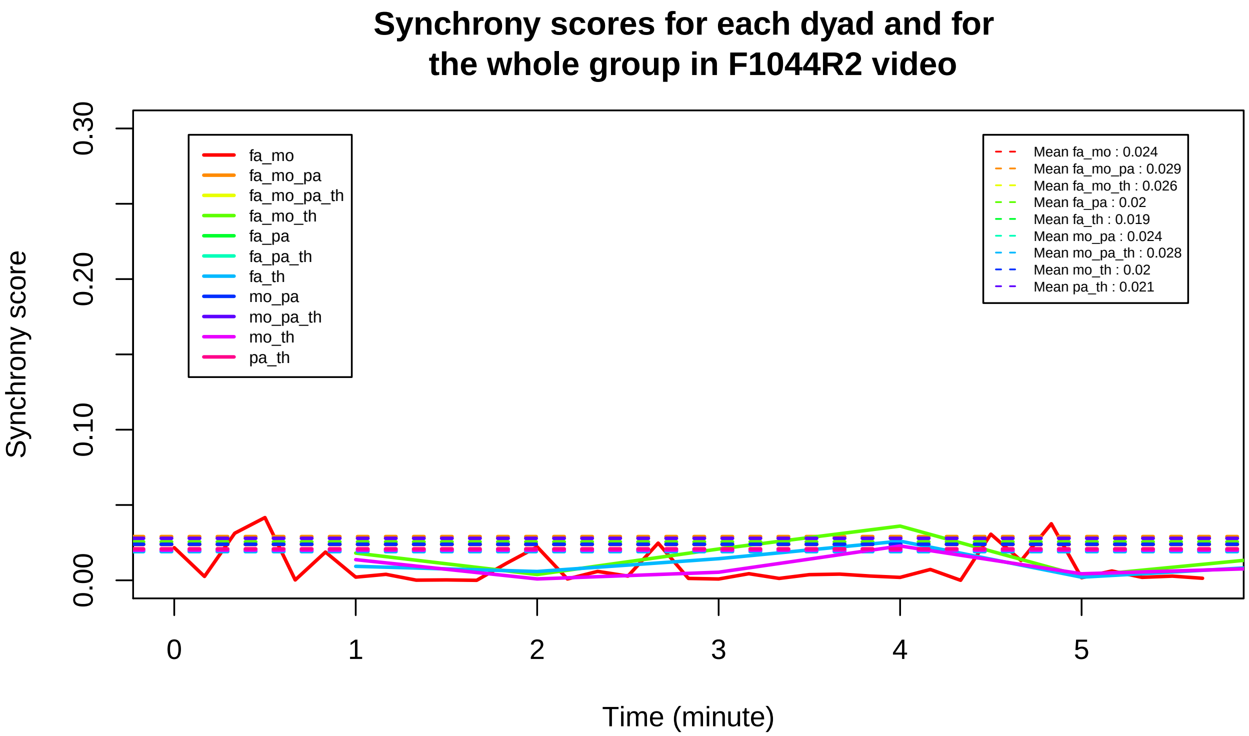


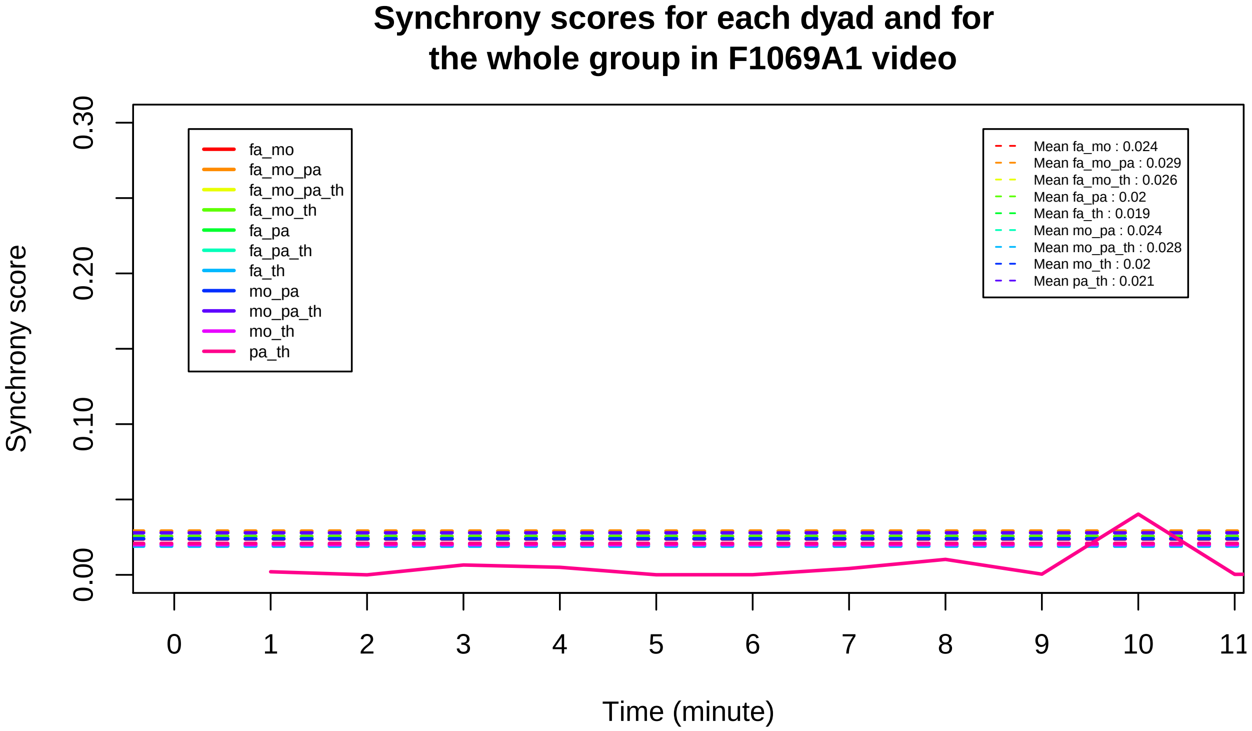
Synchrony scores for each dyad and for the whole group in F1044Q2 video

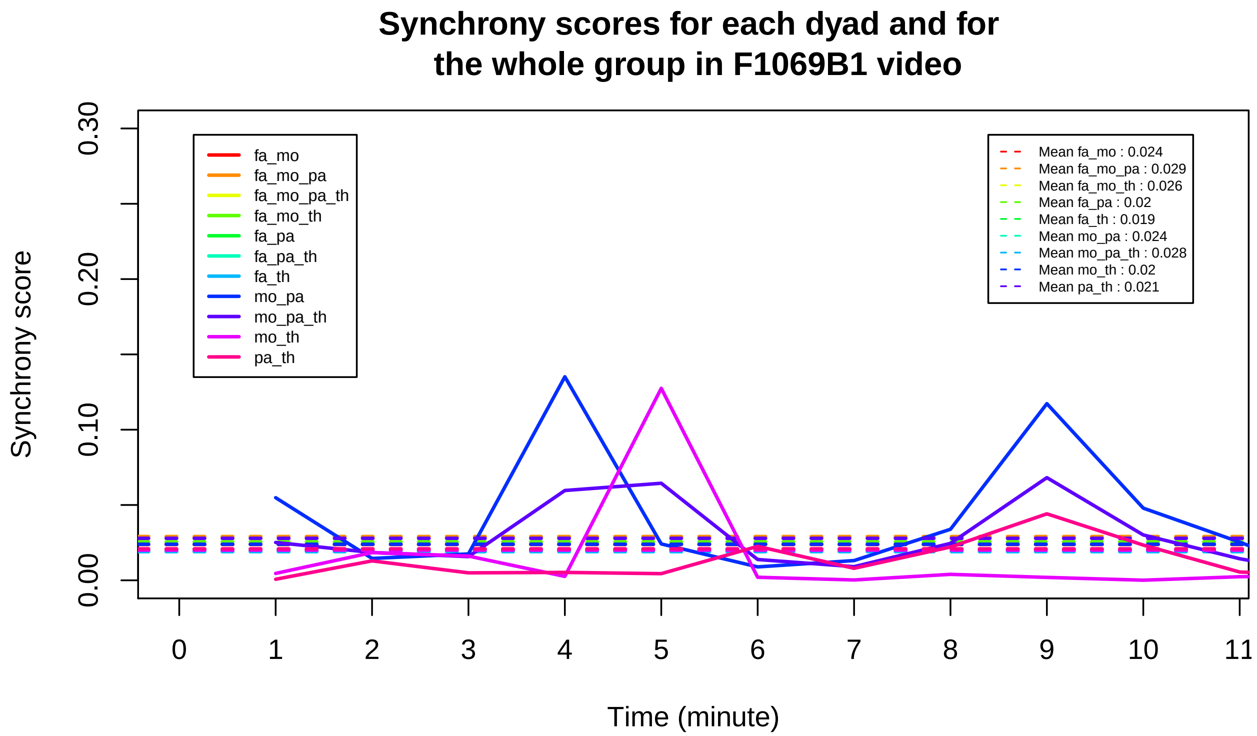


Synchrony scores for each dyad and for the whole group in F1044R1 video

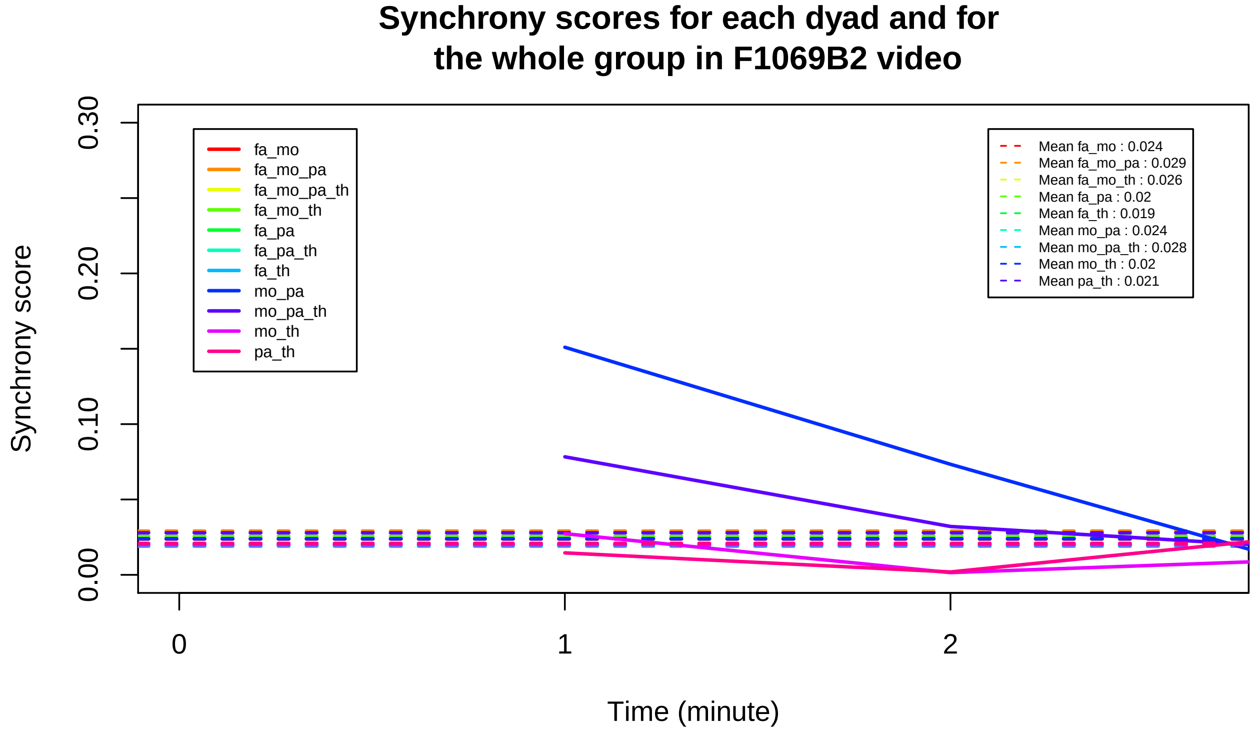



Synchrony scores for each dyad and for
the whole group in F1044R2 video
Synchrony score
0.00
0.10
0.20
0.30
0
1
2
3
4
5
Time (minute)
fa_mo
fa_mo_pa
fa_mo_pa_th
fa_mo_th
fa_pa
fa_pa_th
fa_th
mo_pa
mo_pa_th
mo_th
pa_th
Mean fa_mo : 0.024
Mean fa_mo_pa : 0.029
Mean fa_mo_th : 0.026
Mean fa_pa : 0.02
Mean fa_th : 0.019
Mean mo_pa : 0.024
Mean mo_pa_th : 0.028
Mean mo_th : 0.02
Mean pa_th : 0.021

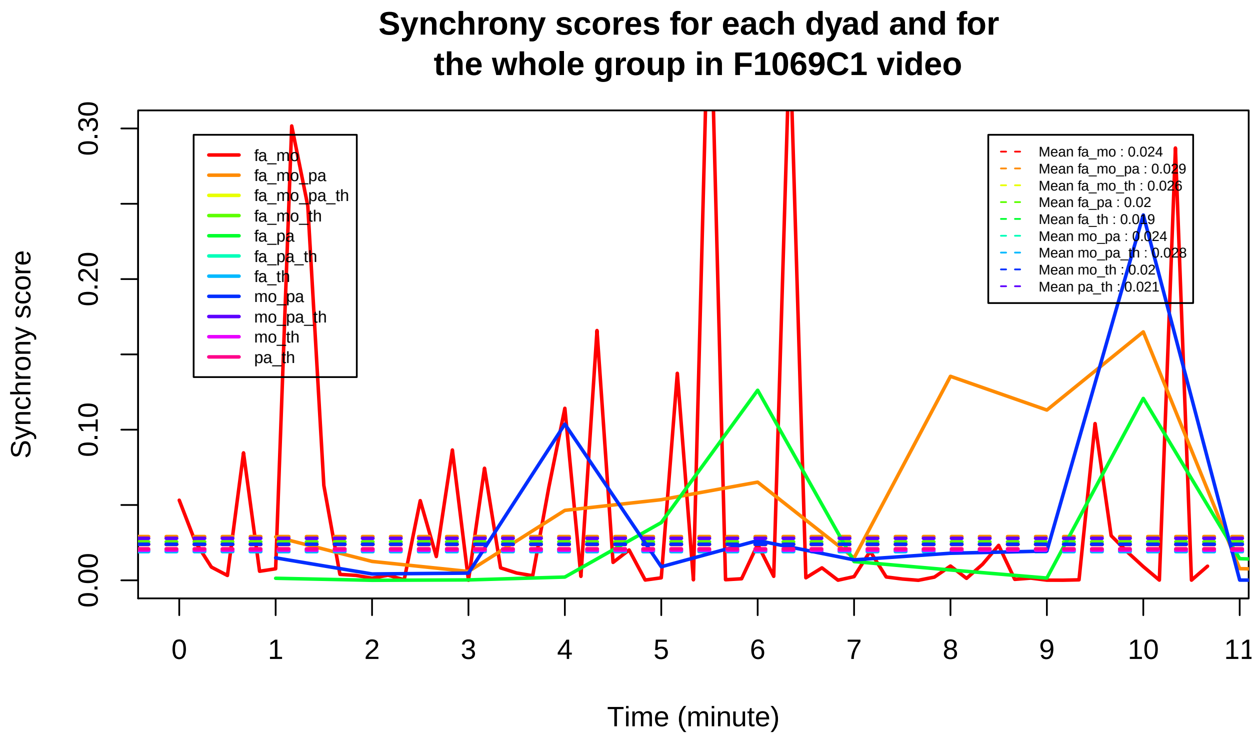

Synchrony scores for each dyad and for
the whole group in F1069A1 video
Synchrony score
0.00
0.10
0.20
0.30
0
1
2
3
4
5
6
7
8
9
10
11
Time (minute)
fa_mo
fa_mo_pa
fa_mo_pa_th
fa_mo_th
fa_pa
fa_pa_th
fa_th
mo_pa
mo_pa_th
mo_th
pa_th
Mean fa_mo : 0.024
Mean fa_mo_pa : 0.029
Mean fa_mo_th : 0.026
Mean fa_pa : 0.02
Mean fa_th : 0.019
Mean mo_pa : 0.024
Mean mo_pa_th : 0.028
Mean mo_th : 0.02
Mean pa_th : 0.021

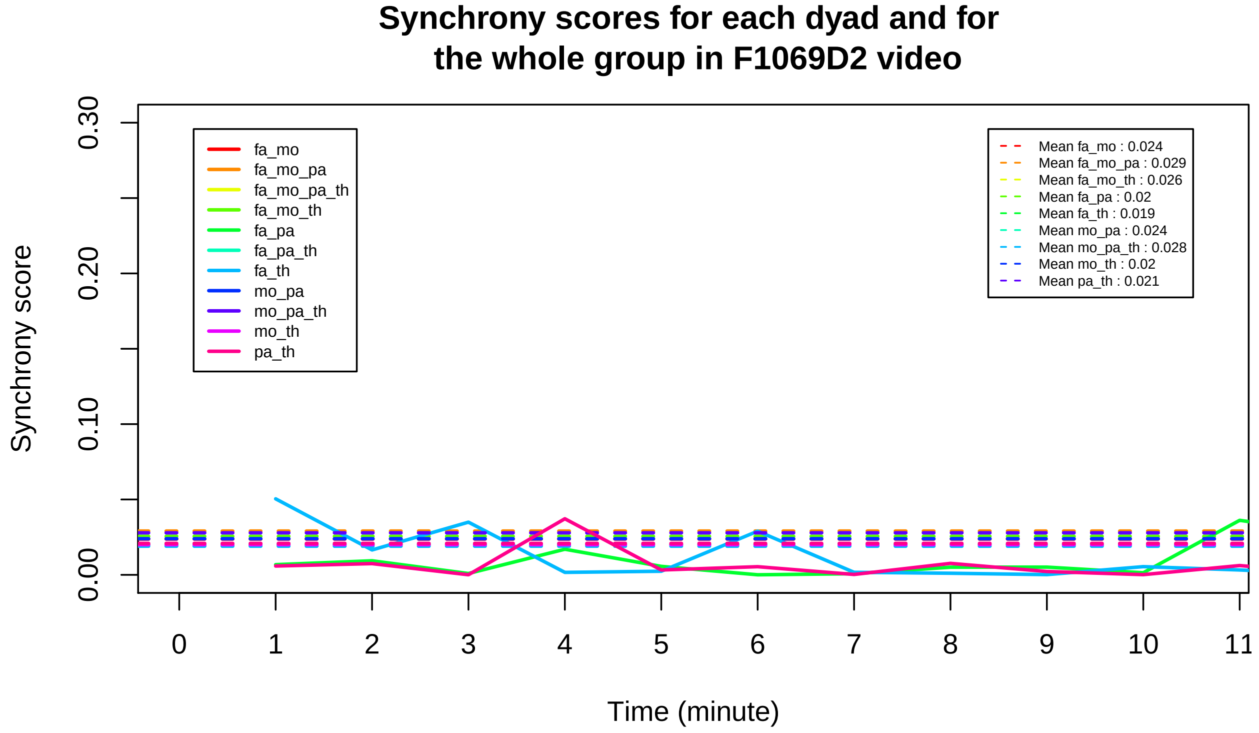


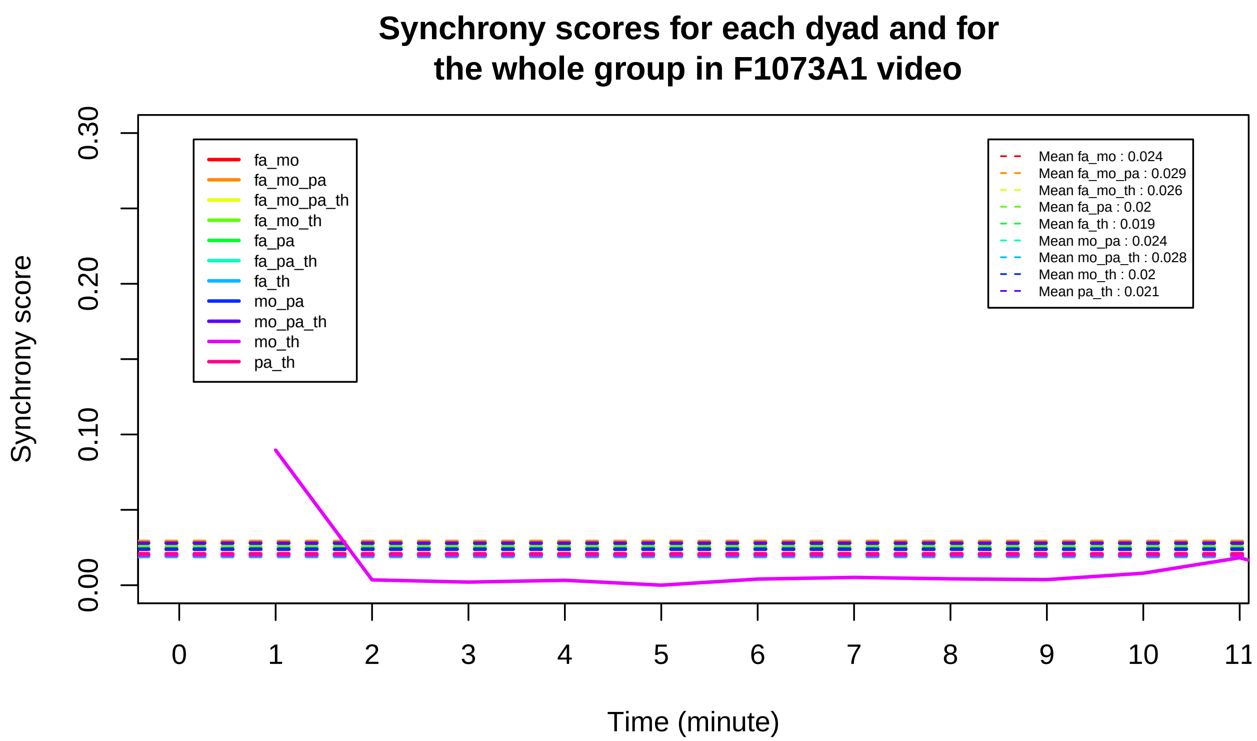
Synchrony scores for each dyad and for the whole group in F1069B1 video

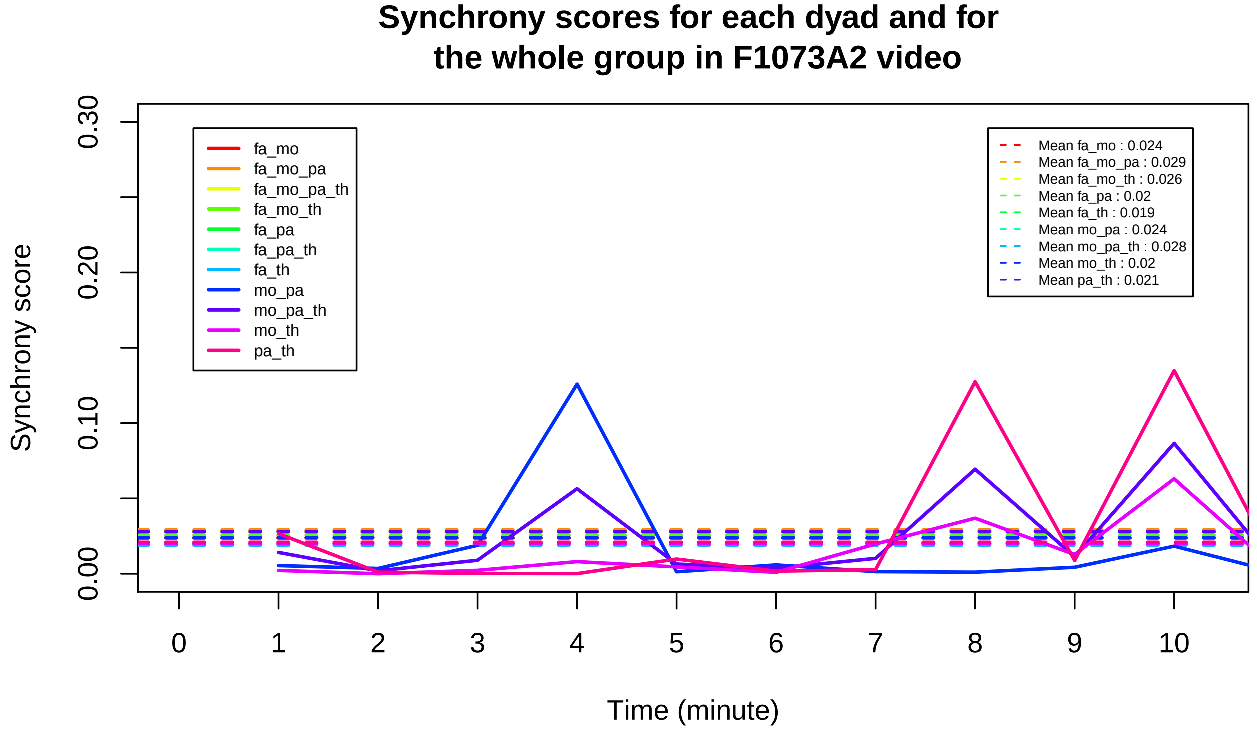


Synchrony scores for each dyad and for the whole group in F1069B2 video


Synchrony scores for each dyad and for
the whole group in F1069C1 video
Synchrony score
0.00
0.10
0.20
0.30
Time (minute)
0
1
2
3
4
5
6
7
8
9
10
11
fa_mo
fa_mo_pa
fa_mo_pa_th
fa_mo_th
fa_pa
fa_pa_th
fa_th
mo_pa
mo_pa_th
mo_th
pa_th
Mean fa_mo : 0.024
Mean fa_mo_pa : 0.029
Mean fa_mo_th : 0.026
Mean fa_pa : 0.02
Mean fa_th : 0.019
Mean mo_pa : 0.024
Mean mo_pa_th : 0.028
Mean mo_th : 0.02
Mean pa_th : 0.021


Synchrony scores for each dyad and for
the whole group in F1069D2 video
Synchrony score
0.00
0.10
0.20
0.30
Time (minute)
0
1
2
3
4
5
6
7
8
9
10
11
fa_mo
fa_mo_pa
fa_mo_pa_th
fa_mo_th
fa_pa
fa_pa_th
fa_th
mo_pa
mo_pa_th
mo_th
pa_th
Mean fa_mo : 0.024
Mean fa_mo_pa : 0.029
Mean fa_mo_th : 0.026
Mean fa_pa : 0.02
Mean fa_th : 0.019
Mean mo_pa : 0.024
Mean mo_pa_th : 0.028
Mean mo_th : 0.02
Mean pa_th : 0.021

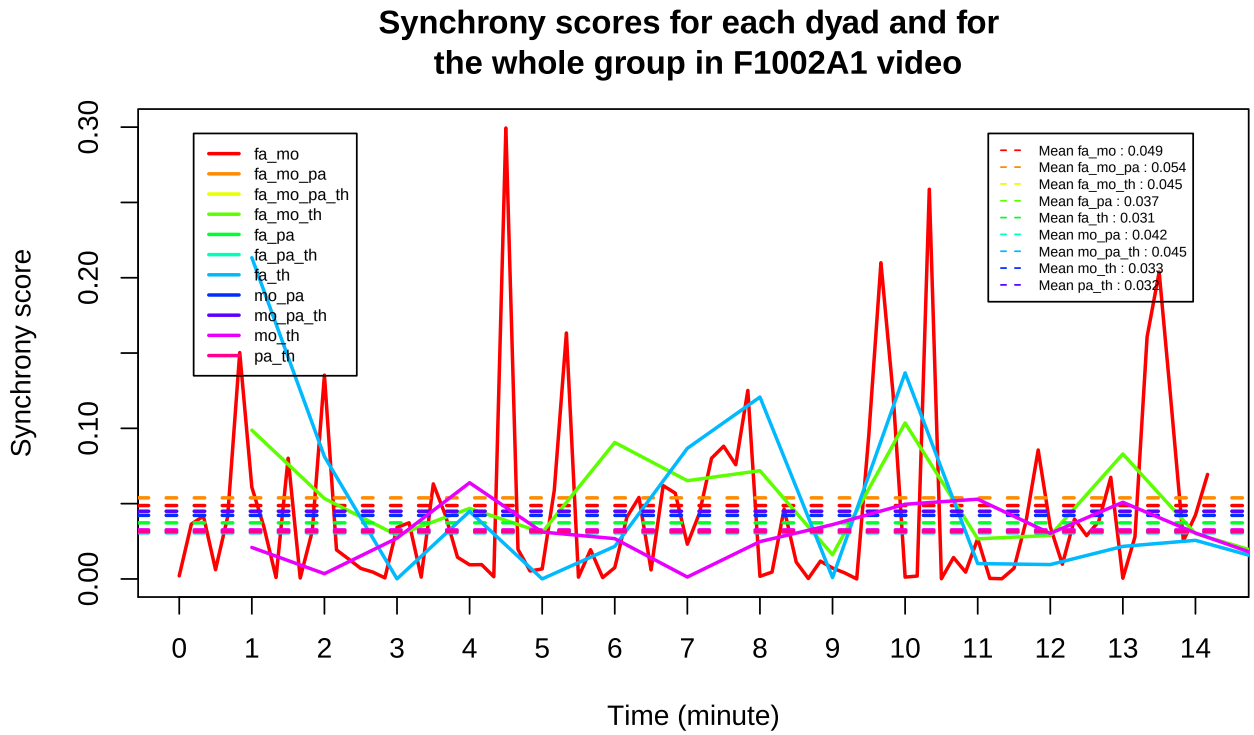

Synchrony scores for each dyad and for the whole group in F1073A1 video

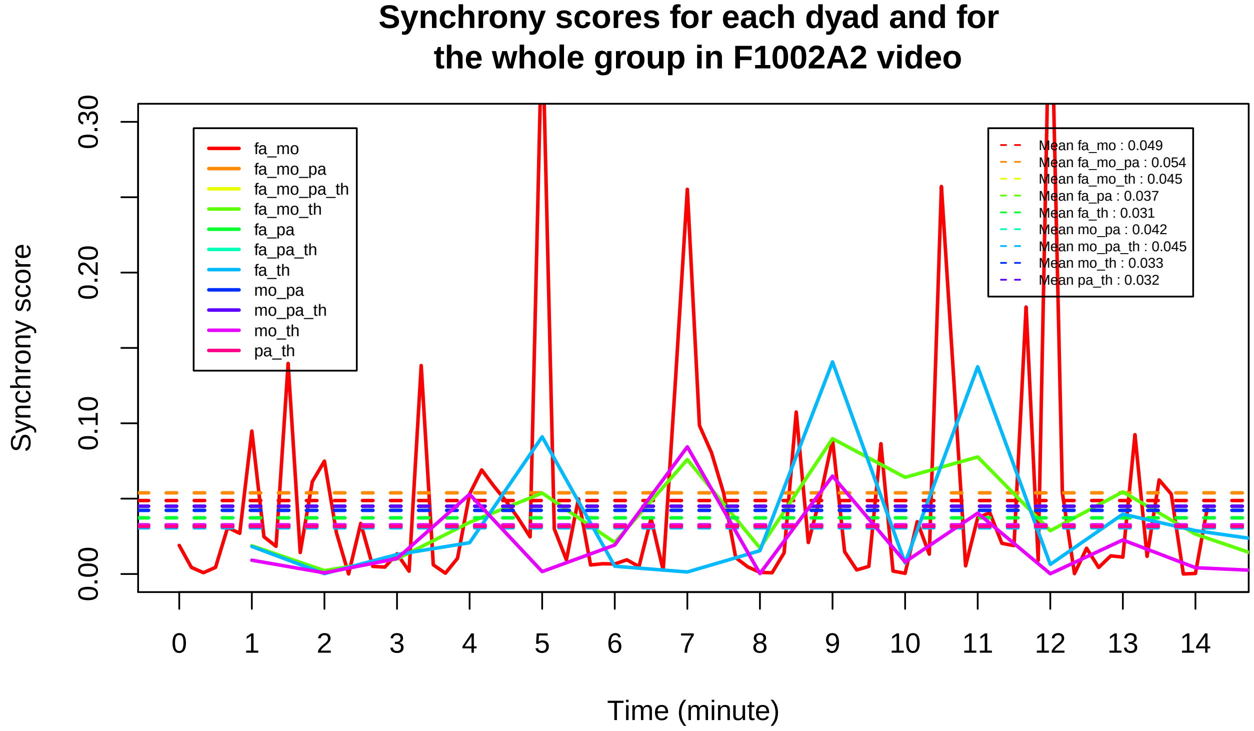

Synchrony scores for each dyad and for the whole group in F1073A2 video

Synchrony scores(log data) for each dyad, triad and for the whole group

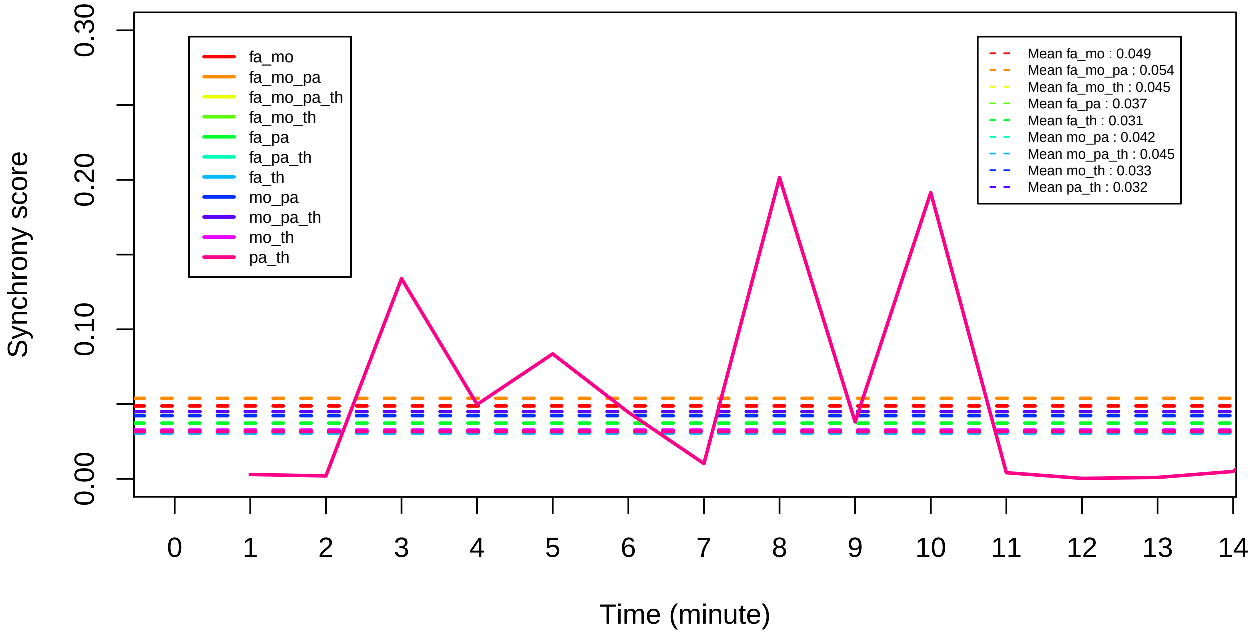
In legend, mean for all the video.

```
for (i in unique(SSIlogdataFrame$video))
      {par(mar=c(4,4,4,3), mfrow=c(1,1))
      plot(SSIlogdataFrame[which(SSIlogdataFrame$video==i),]$Time_min,
           SSIlogdataFrame[which(SSIlogdataFrame$video==i),]$SSI_fa_mo,
           type="l", ylim=c(0, 0.3), col=rainbow(4)[1],
           main=paste("Synchrony scores for each dyad and for \n the whole group in", i, "video"),
           xlab = "Time (minute)", ylab="Synchrony score", lwd=2,
xaxp=c(0,length(SSIlogdataFrame$Time_min), length(SSIlogdataFrame$Time_min)))
      abline(h=mean(SSIlogdataFrame$SSI_fa_mo, na.rm=TRUE), col=rainbow(11)[1], lwd=2, lty=2)

      lines(SSIlogdataFrame[which(SSIlogdataFrame$video==i),]$SSI_fa_mo_pa, col=rainbow(11)[2], lwd=2)
      abline(h= mean(SSIlogdataFrame$SSI_fa_mo_pa, na.rm=TRUE), col=rainbow(11)[2], lwd=2, lty=2)

#      lines(SSIlogdataFrame[which(SSIlogdataFrame$video==i),]$SSI_fa_mo_pa_th, col=rainbow(11)[3], lwd
#      abline(h= mean(SSIlogdataFrame$SSI_fa_mo_pa_th, na.rm=TRUE), col=rainbow(11)[3], lwd=2, lty=2)

      lines(SSIlogdataFrame[which(SSIlogdataFrame$video==i),]$SSI_fa_mo_th, col=rainbow(11)[4], lwd=2)
      abline(h= mean(SSIlogdataFrame$SSI_fa_mo_th, na.rm=TRUE), col=rainbow(11)[4], lwd=2, lty=2)

      lines(SSIlogdataFrame[which(SSIlogdataFrame$video==i),]$SSI_fa_pa, col=rainbow(11)[5], lwd=2)
      abline(h= mean(SSIlogdataFrame$SSI_fa_pa, na.rm=TRUE), col=rainbow(11)[5], lwd=2, lty=2)

#      lines(SSIlogdataFrame[which(SSIlogdataFrame$video==i),]$SSI_fa_pa_th, col=rainbow(11)[6], lwd=2)
#      abline(h= mean(SSIlogdataFrame$SSI_fa_pa_th, na.rm=TRUE), col=rainbow(11)[6], lwd=2, lty=2)

lines(SSIlogdataFrame[which(SSIlogdataFrame$video==i),]$SSI_fa_th, col=rainbow(11)[7], lwd=2)
abline(h= mean(SSIlogdataFrame$SSI_fa_th, na.rm=TRUE), col=rainbow(11)[7], lwd=2, lty=2)

lines(SSIlogdataFrame[which(SSIlogdataFrame$video==i),]$SSI_mo_pa, col=rainbow(11)[8], lwd=2)
abline(h= mean(SSIlogdataFrame$SSI_mo_pa, na.rm=TRUE), col=rainbow(11)[8], lwd=2, lty=2)

lines(SSIlogdataFrame[which(SSIlogdataFrame$video==i),]$SSI_mo_pa_th, col=rainbow(11)[9], lwd=2)
abline(h= mean(SSIlogdataFrame$SSI_mo_pa_th, na.rm=TRUE), col=rainbow(11)[9], lwd=2, lty=2)
lines(SSIlogdataFrame[which(SSIlogdataFrame$video==i),]$SSI_mo_th, col=rainbow(11)[10], lwd=2)
abline(h= mean(SSIlogdataFrame$SSI_mo_th, na.rm=TRUE), col=rainbow(11)[10], lwd=2, lty=2)

      lines(SSIlogdataFrame[which(SSIlogdataFrame$video==i),]$SSI_pa_th, col=rainbow(11)[11], lwd=2)
      abline(h= mean(SSIlogdataFrame$SSI_pa_th, na.rm=TRUE), col=rainbow(11)[11], lwd=2, lty=2)

legend("topleft", inset=.05, c("fa_mo", "fa_mo_pa", "fa_mo_pa_th",
"fa_mo_th", "fa_pa", "fa_pa_th", "fa_th",
"mo_pa", "mo_pa_th", "mo_th", "pa_th"),
col=rainbow(11), cex=0.6, lwd=2)

legend("topright", inset=.05, c(paste ("Mean fa_mo :",
                                       round(mean(SSIlogdataFrame$SSI_fa_mo, na.rm=TRUE),3)),
      paste ("Mean fa_mo_pa :", round(mean(SSIlogdataFrame$SSI_fa_mo_pa,na.rm=TRUE),3)),
#      paste ("Mean fa_mo_pa_th :", #round(mean(SSIlogdataFrame$SSI_fa_mo_pa_th),3)),
      paste ("Mean fa_mo_th :", round(mean(SSIlogdataFrame$SSI_fa_mo_th,na.rm=TRUE),3)),
      paste ("Mean fa_pa :", round(mean(SSIlogdataFrame$SSI_fa_pa, na.rm=TRUE),3)),
#      paste ("Mean fa_pa_th :", round(mean(SSIlogdataFrame$SSI_fa_pa_th,na.rm=TRUE),3)),
      paste ("Mean fa_th :", round(mean(SSIlogdataFrame$SSI_fa_th,na.rm=TRUE),3)),
      paste ("Mean mo_pa :", round(mean(SSIlogdataFrame$SSI_mo_pa,na.rm=TRUE),3)),
      paste ("Mean mo_pa_th :", round(mean(SSIlogdataFrame$SSI_mo_pa_th,na.rm=TRUE),3)),
      paste ("Mean mo_th :", round(mean(SSIlogdataFrame$SSI_mo_th,na.rm=TRUE),3)),
      paste ("Mean pa_th :", round(mean(SSIlogdataFrame$SSI_pa_th,na.rm=TRUE),3))),
col=rainbow(11), cex=0.5, lty=2, lwd=1)}
```

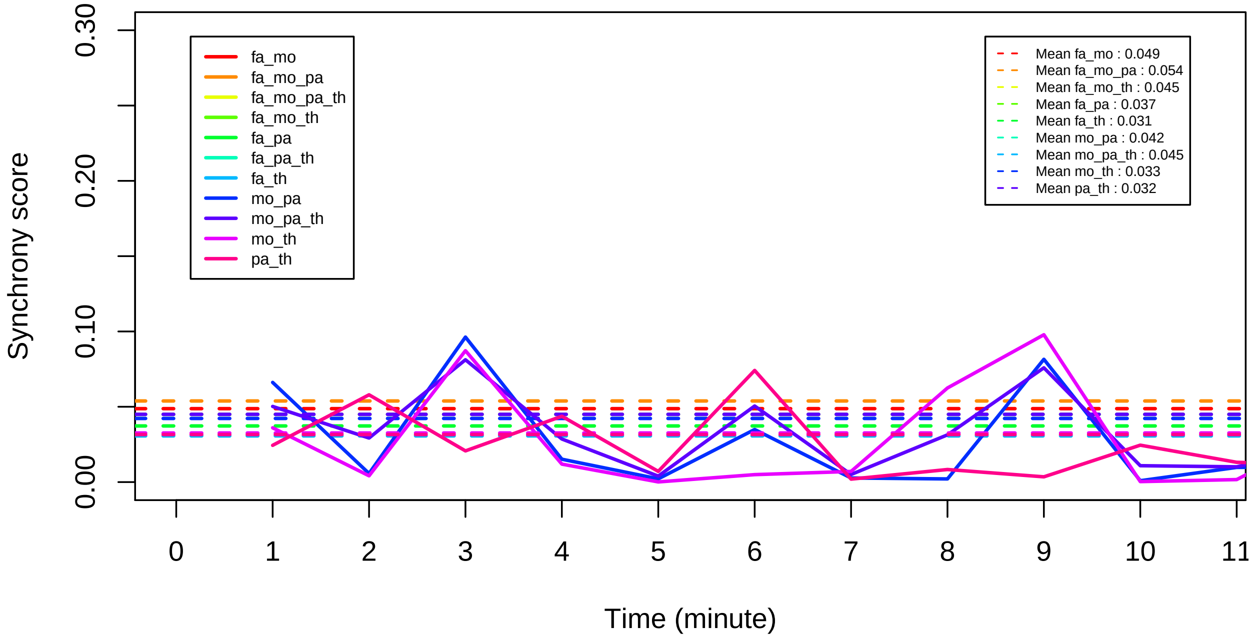


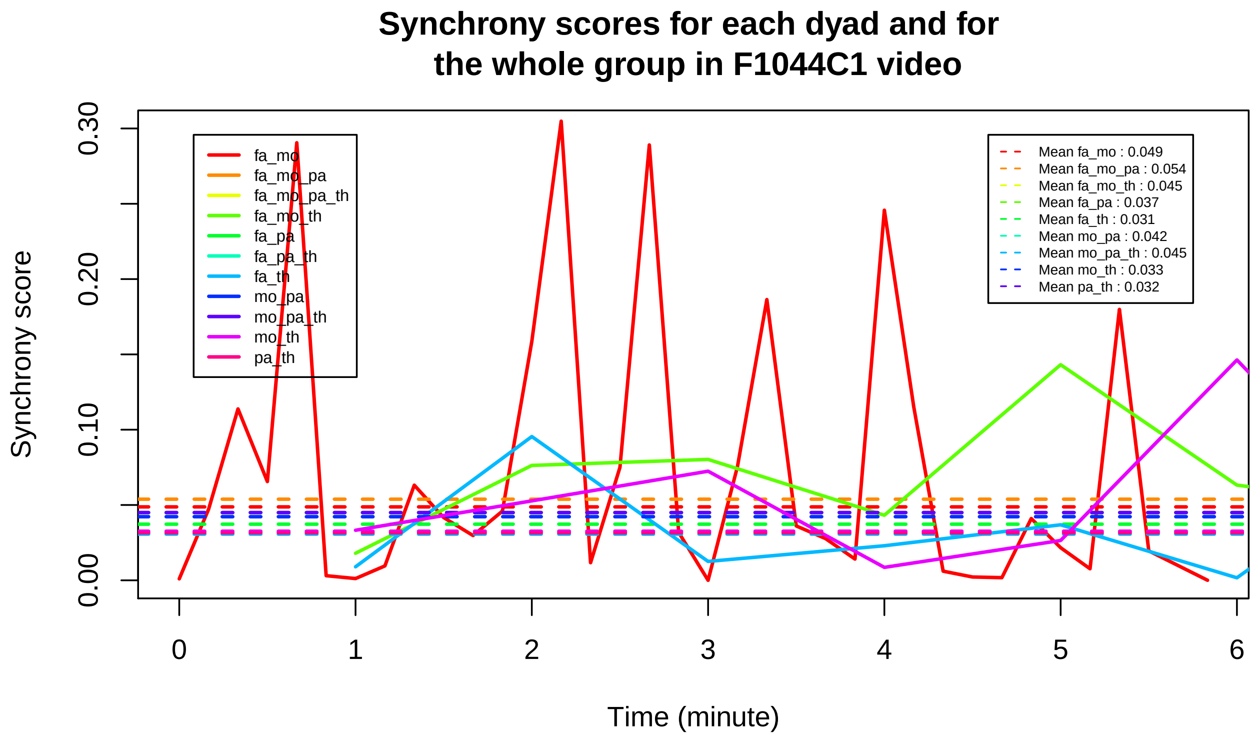


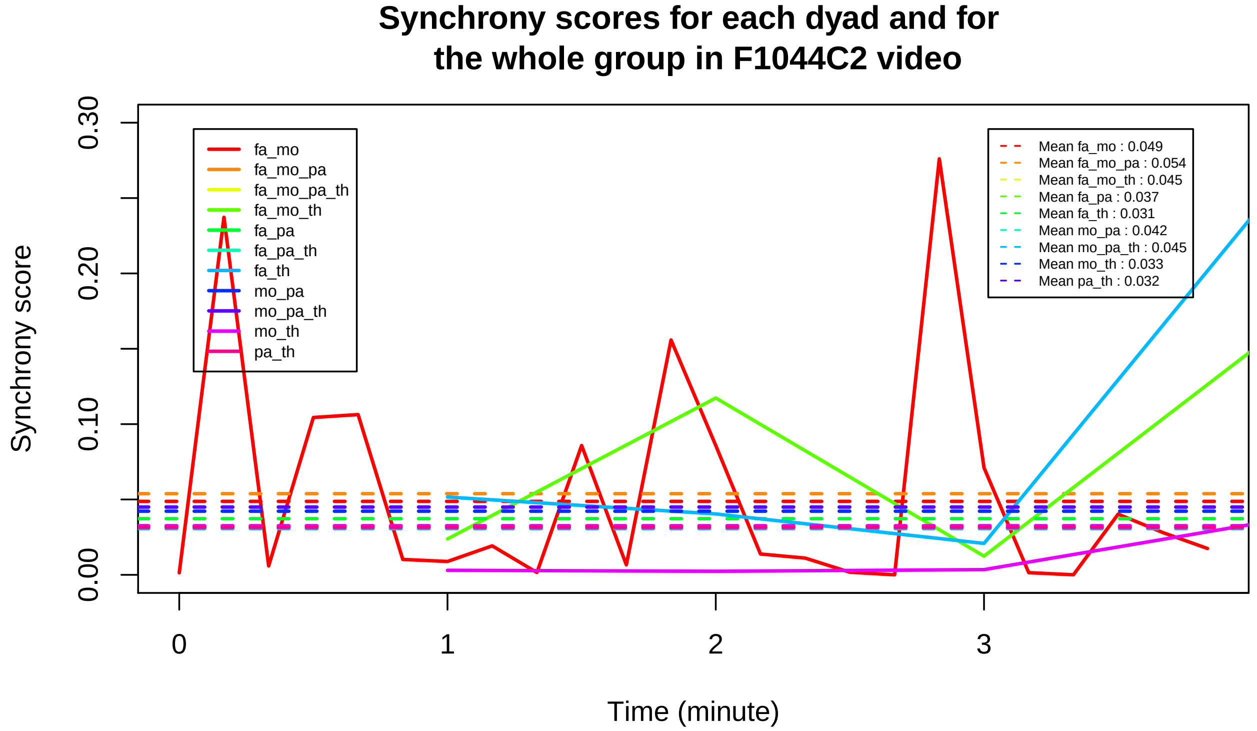
Synchrony scores for each dyad and for the whole group in F1002B2 video

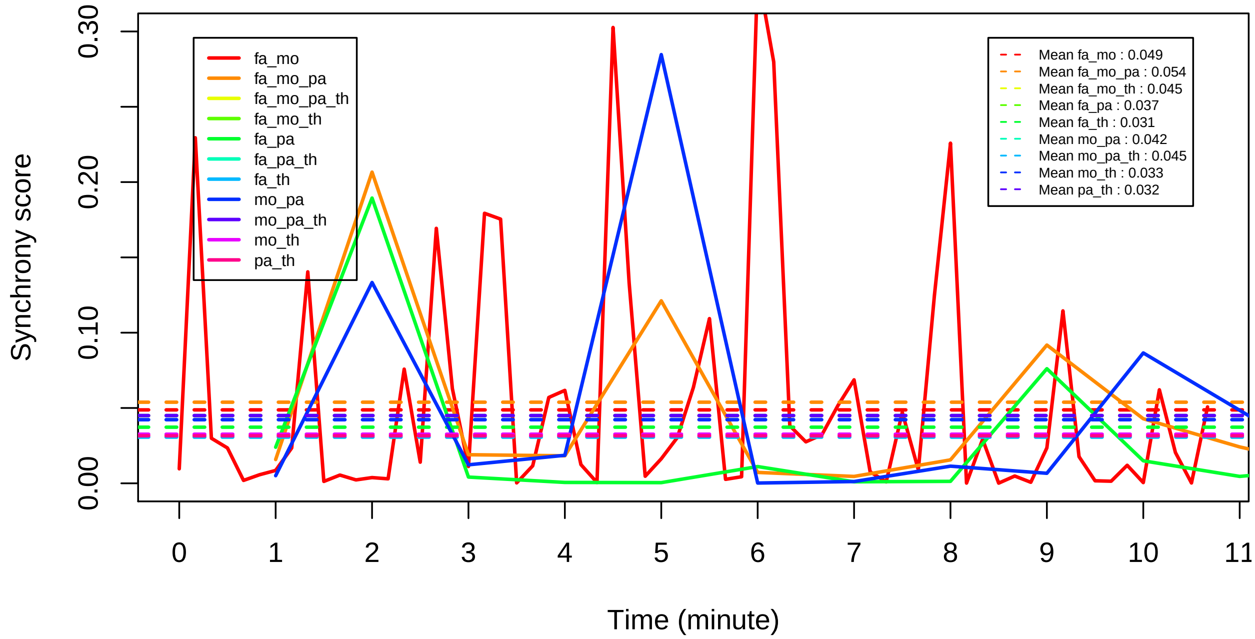


Synchrony scores for each dyad and for the whole group in F1002C1 video

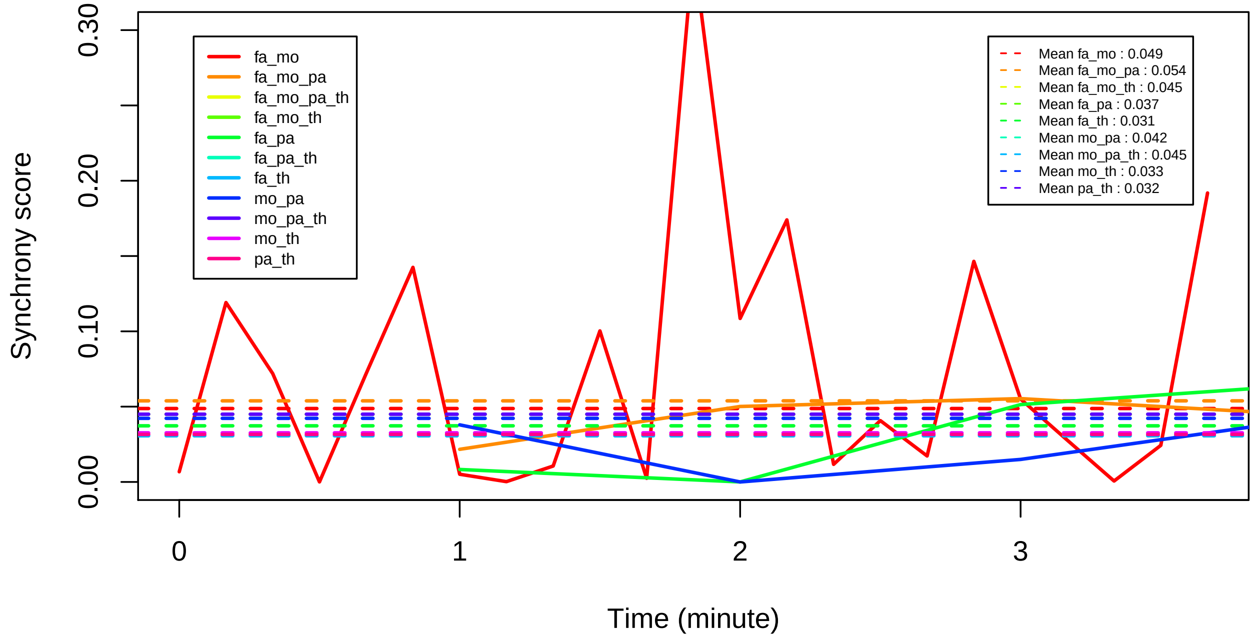



Synchrony scores for each dyad and for
the whole group in F1044C1 video
Synchrony score
0.00
0.10
0.20
0.30
Time (minute)
0
1
2
3
4
5
6
fa_mo
fa_mo_pa
fa_mo_pa_th
fa_mo_th
fa_pa
fa_pa_th
fa_th
mo_pa
mo_pa_th
mo_th
pa_th
Mean fa_mo : 0.049
Mean fa_mo_pa : 0.054
Mean fa_mo_th : 0.045
Mean fa_pa : 0.037
Mean fa_th : 0.031
Mean mo_pa : 0.042
Mean mo_pa_th : 0.045
Mean mo_th : 0.033
Mean pa_th : 0.032


Synchrony scores for each dyad and for
the whole group in F1044C2 video
Synchrony score
0.00
0.10
0.20
0.30
Time (minute)
0
1
2
3
fa_mo
fa_mo_pa
fa_mo_pa_th
fa_mo_th
fa_pa
fa_pa_th
fa_th
mo_pa
mo_pa_th
mo_th
pa_th
Mean fa_mo : 0.049
Mean fa_mo_pa : 0.054
Mean fa_mo_th : 0.045
Mean fa_pa : 0.037
Mean fa_th : 0.031
Mean mo_pa : 0.042
Mean mo_pa_th : 0.045
Mean mo_th : 0.033
Mean pa_th : 0.032

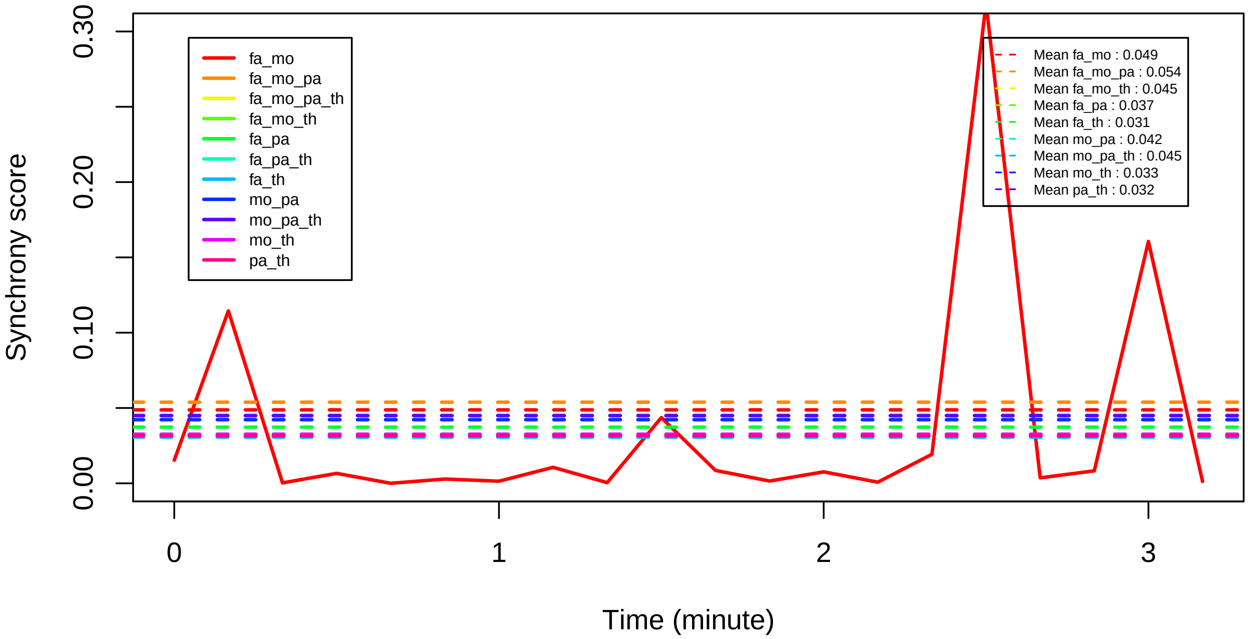


Synchrony scores for each dyad and for the whole group in F1044D1 video

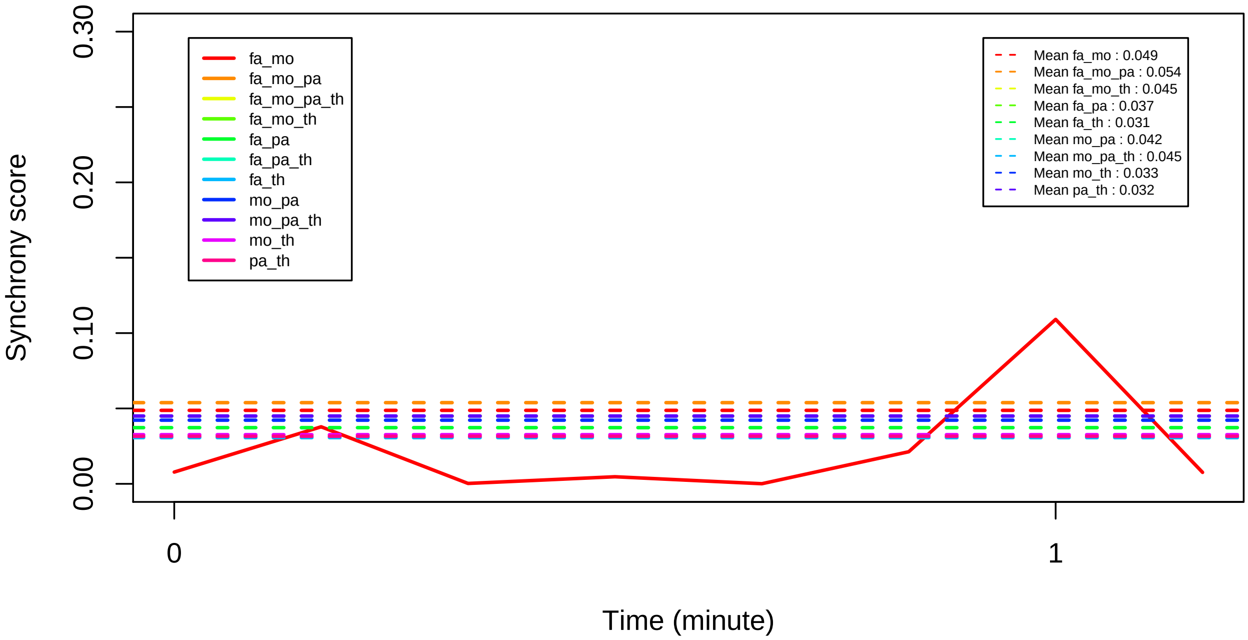


Synchrony scores for each dyad and for the whole group in F1044D2 video

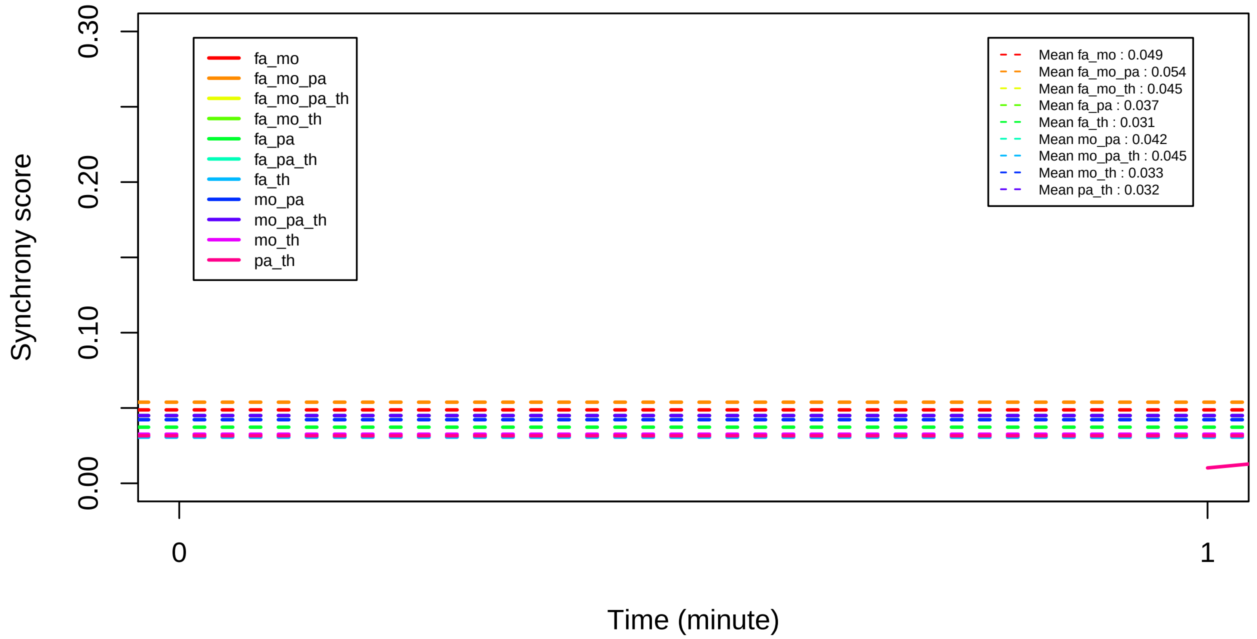
Synchrony scores for each dyad and for the whole group in F1044E1 video



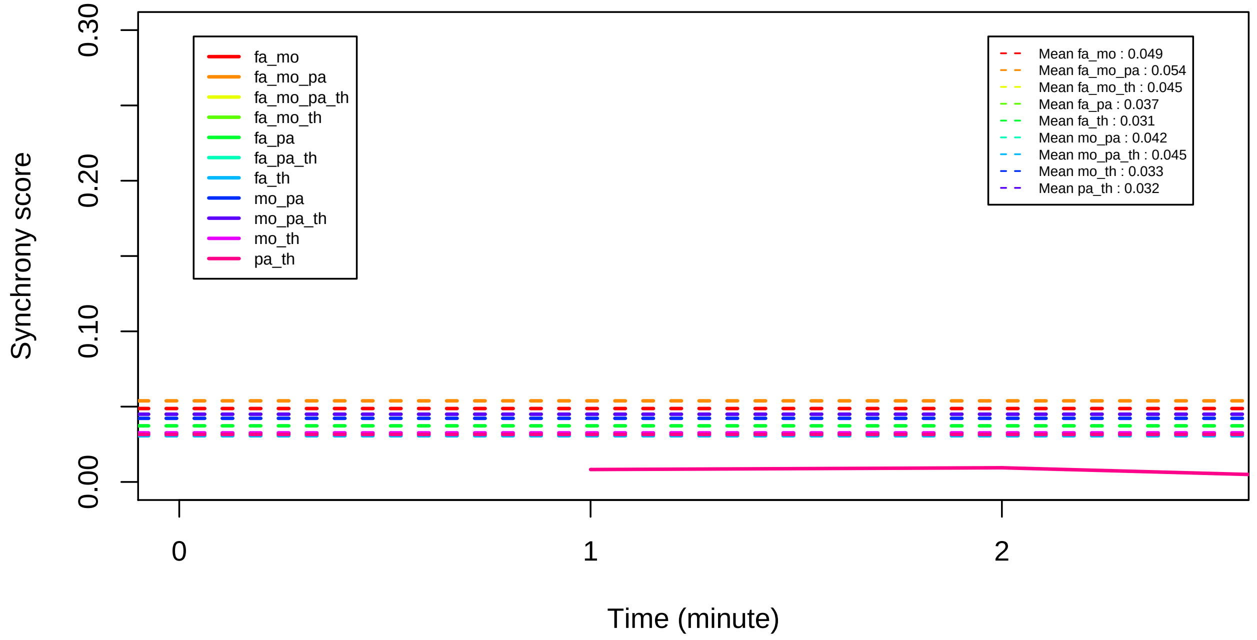
Synchrony scores for each dyad and for the whole group in F1044E2 video

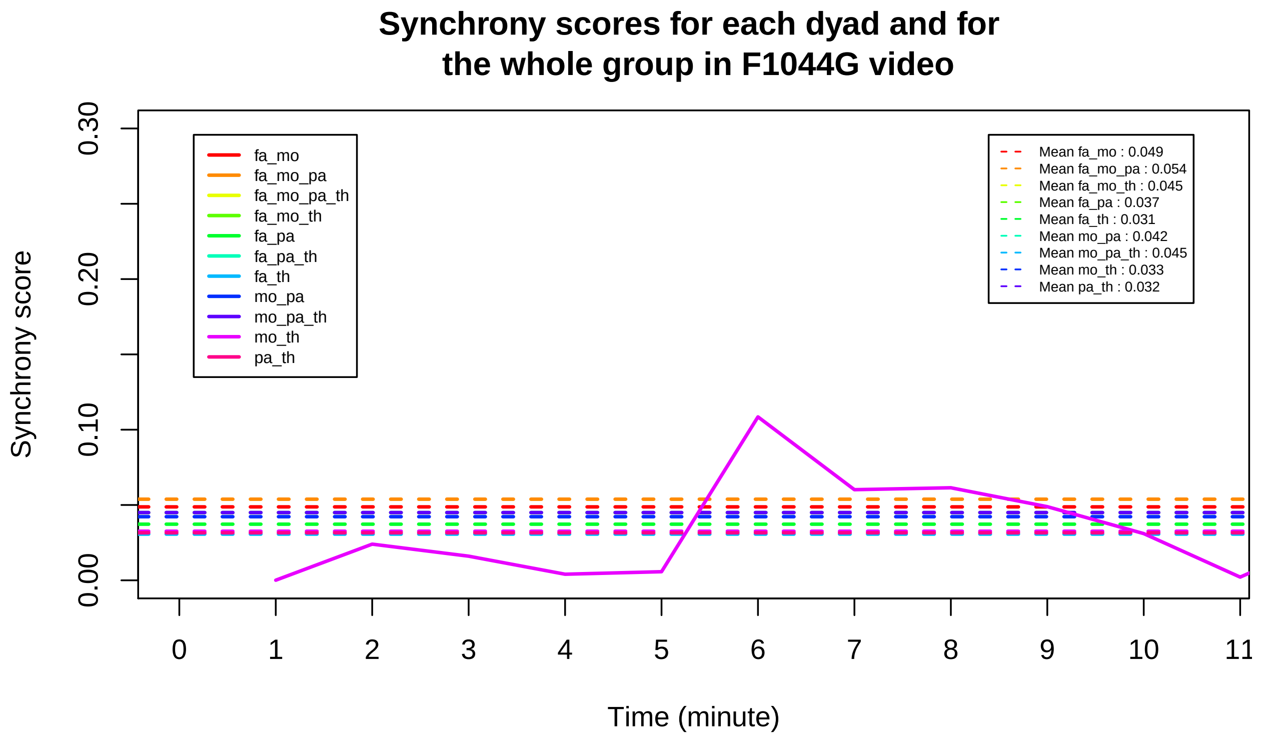


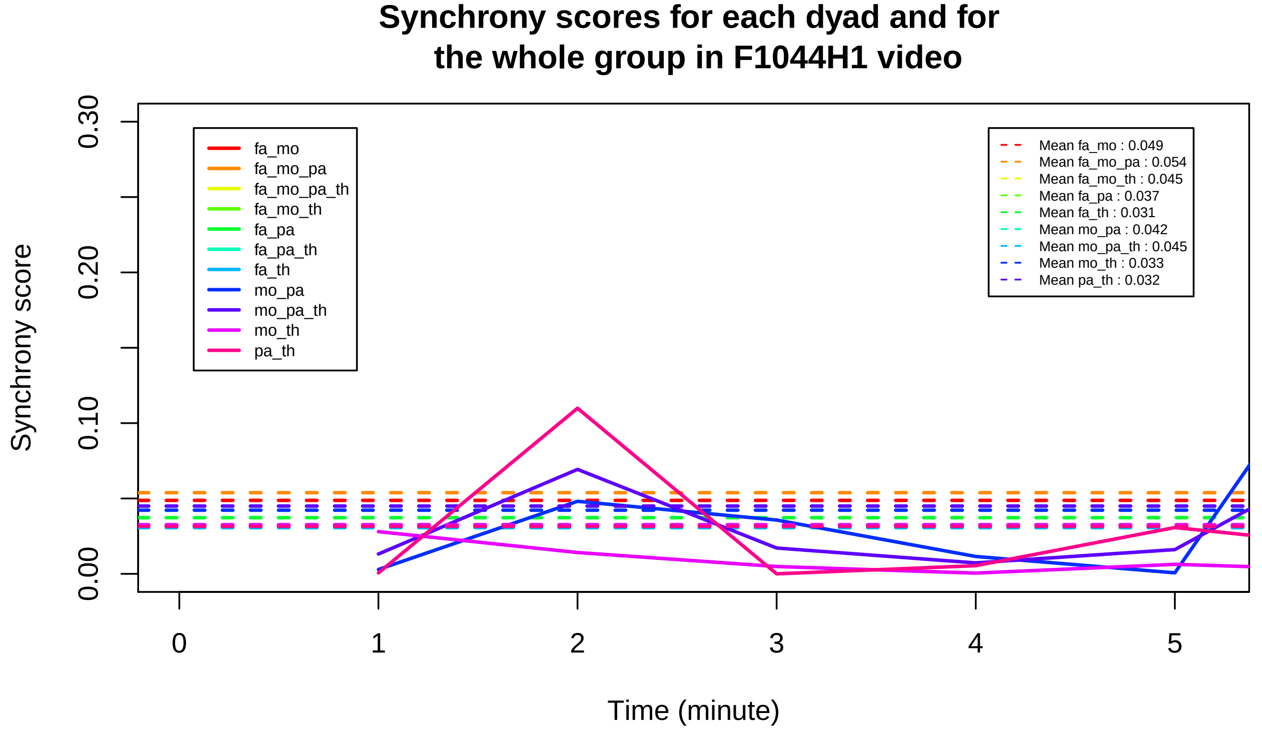
Synchrony scores for each dyad and for the whole group in F1044F1 video



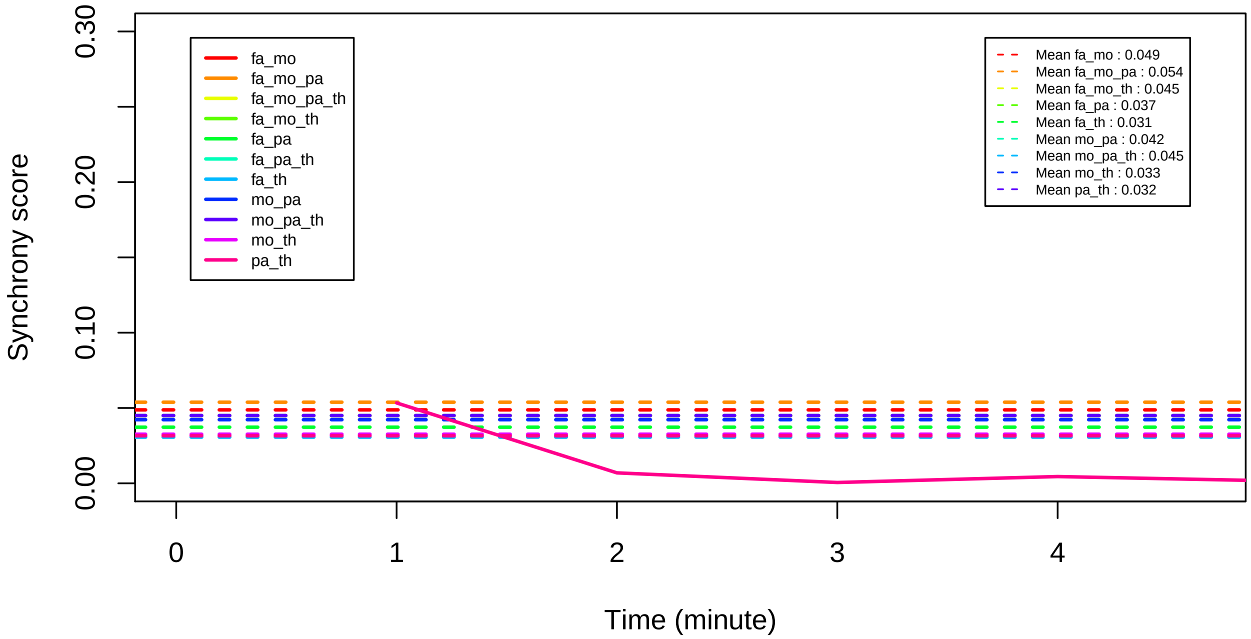
Synchrony scores for each dyad and for the whole group in F1044F2 video



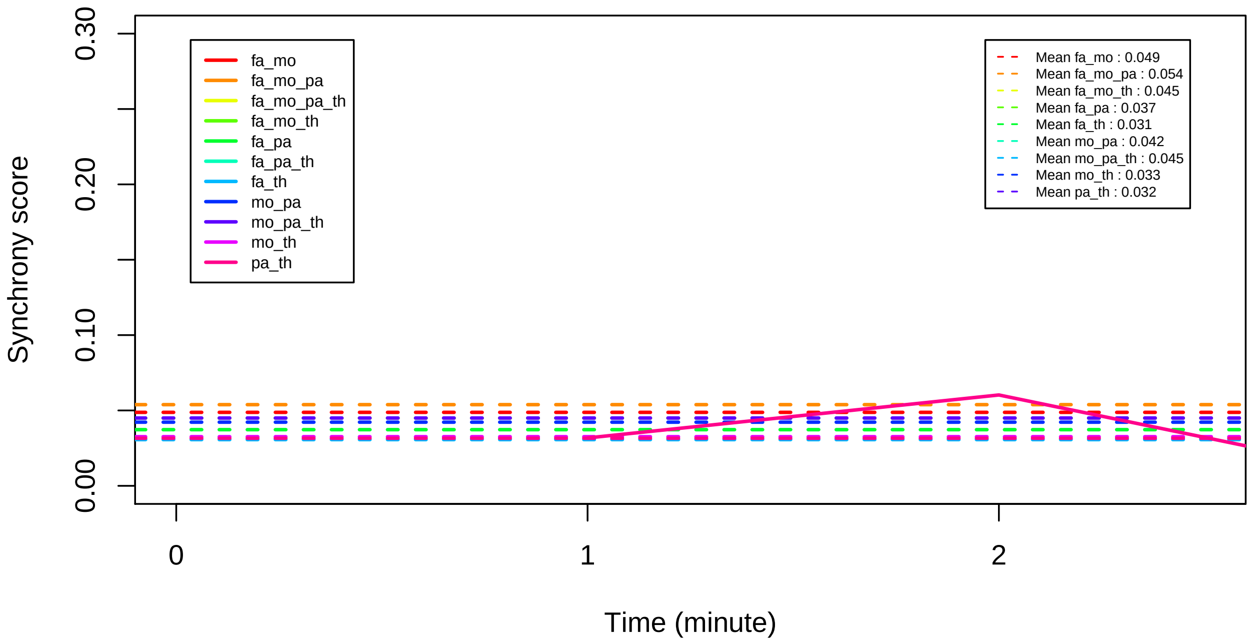

Synchrony scores for each dyad and for
the whole group in F1044G video
Synchrony score
0.00
0.10
0.20
0.30
Time (minute)
0
1
2
3
4
5
6
7
8
9
10
11
fa_mo
fa_mo_pa
fa_mo_pa_th
fa_mo_th
fa_pa
fa_pa_th
fa_th
mo_pa
mo_pa_th
mo_th
pa_th
Mean fa_mo : 0.049
Mean fa_mo_pa : 0.054
Mean fa_mo_th : 0.045
Mean fa_pa : 0.037
Mean fa_th : 0.031
Mean mo_pa : 0.042
Mean mo_pa_th : 0.045
Mean mo_th : 0.033
Mean pa_th : 0.032

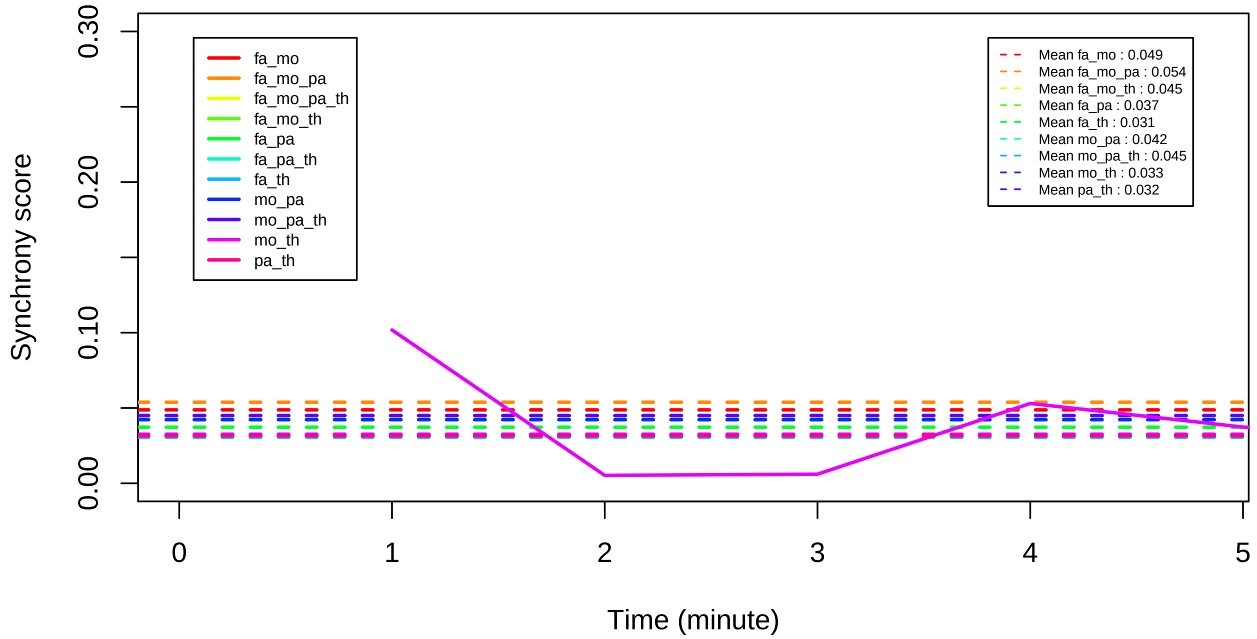

Synchrony scores for each dyad and for
the whole group in F1044H1 video
Synchrony score
0.00
0.10
0.20
0.30
Time (minute)
0
1
2
3
4
5
fa_mo
fa_mo_pa
fa_mo_pa_th
fa_mo_th
fa_pa
fa_pa_th
fa_th
mo_pa
mo_pa_th
mo_th
pa_th
Mean fa_mo : 0.049
Mean fa_mo_pa : 0.054
Mean fa_mo_th : 0.045
Mean fa_pa : 0.037
Mean fa_th : 0.031
Mean mo_pa : 0.042
Mean mo_pa_th : 0.045
Mean mo_th : 0.033
Mean pa_th : 0.032

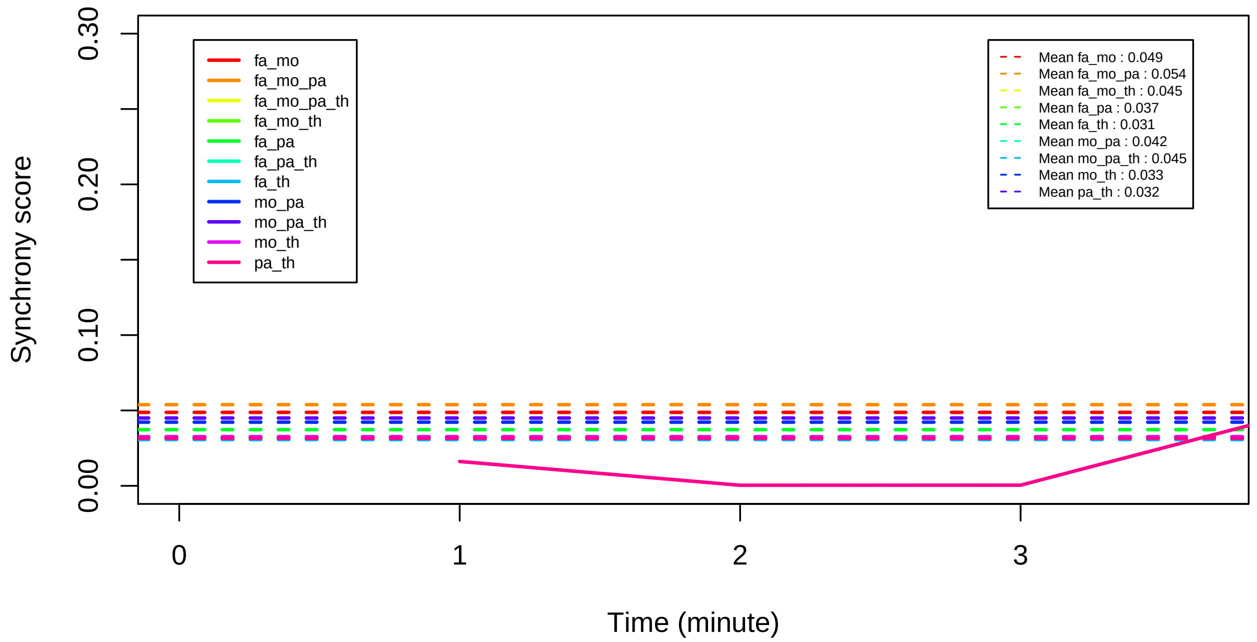
Synchrony scores for each dyad and for
the whole group in F1044H2 video



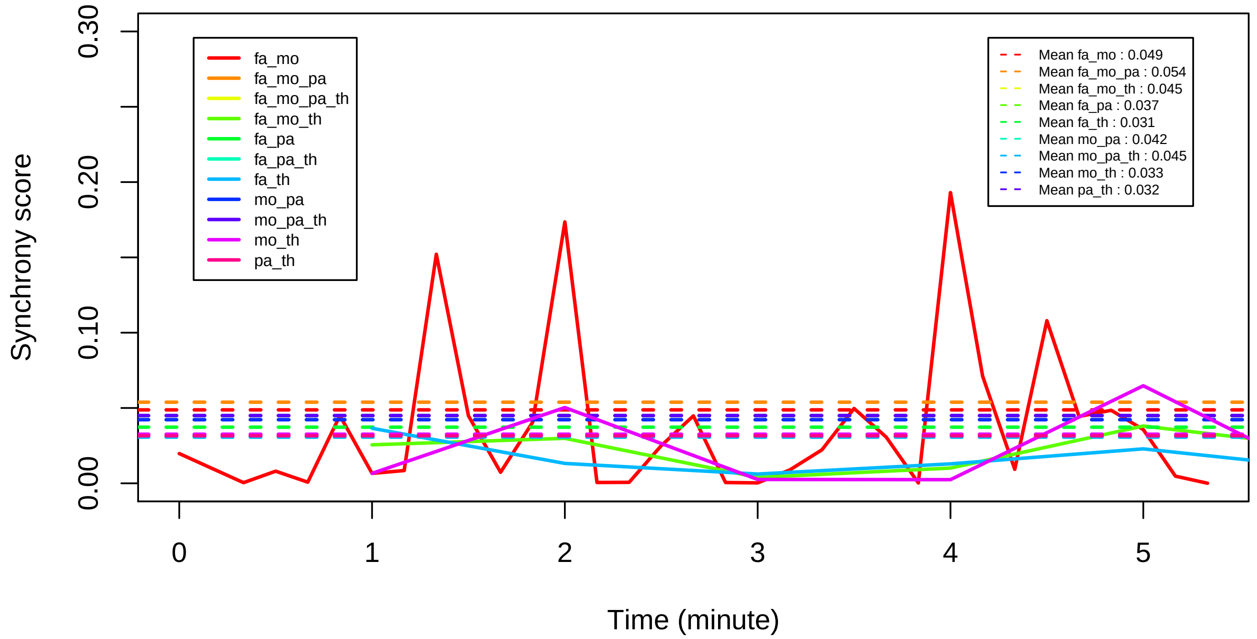
Synchrony scores for each dyad and for
the whole group in F1044I1 video



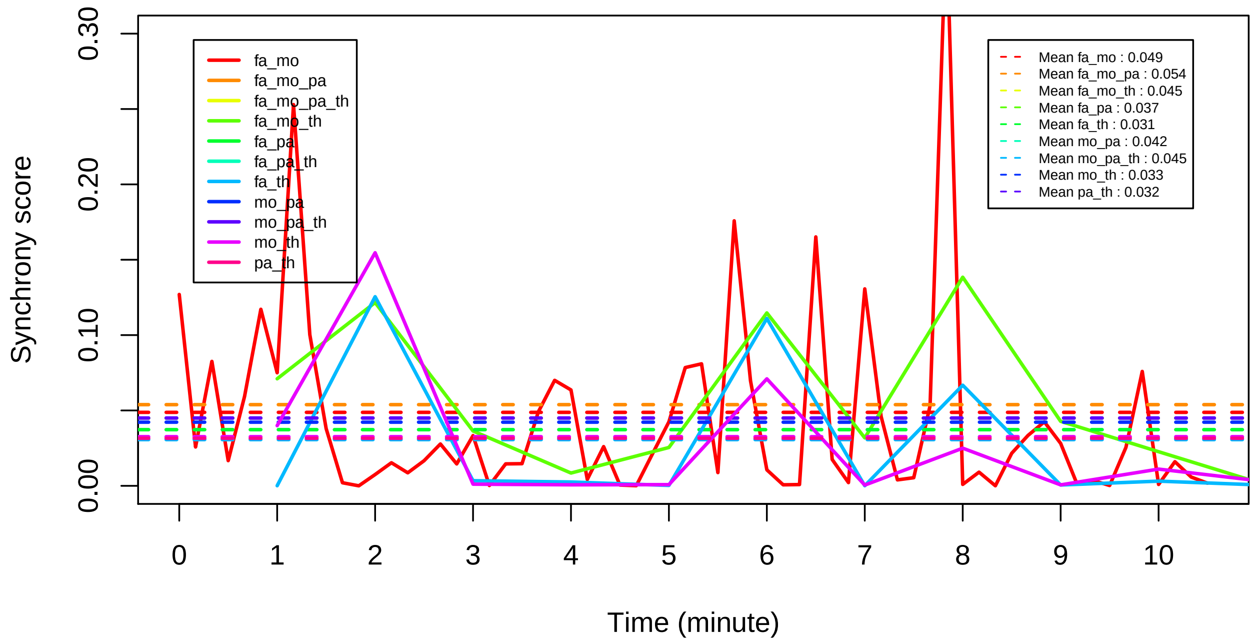

Synchrony scores for each dyad and for the whole group in F1044I2 video

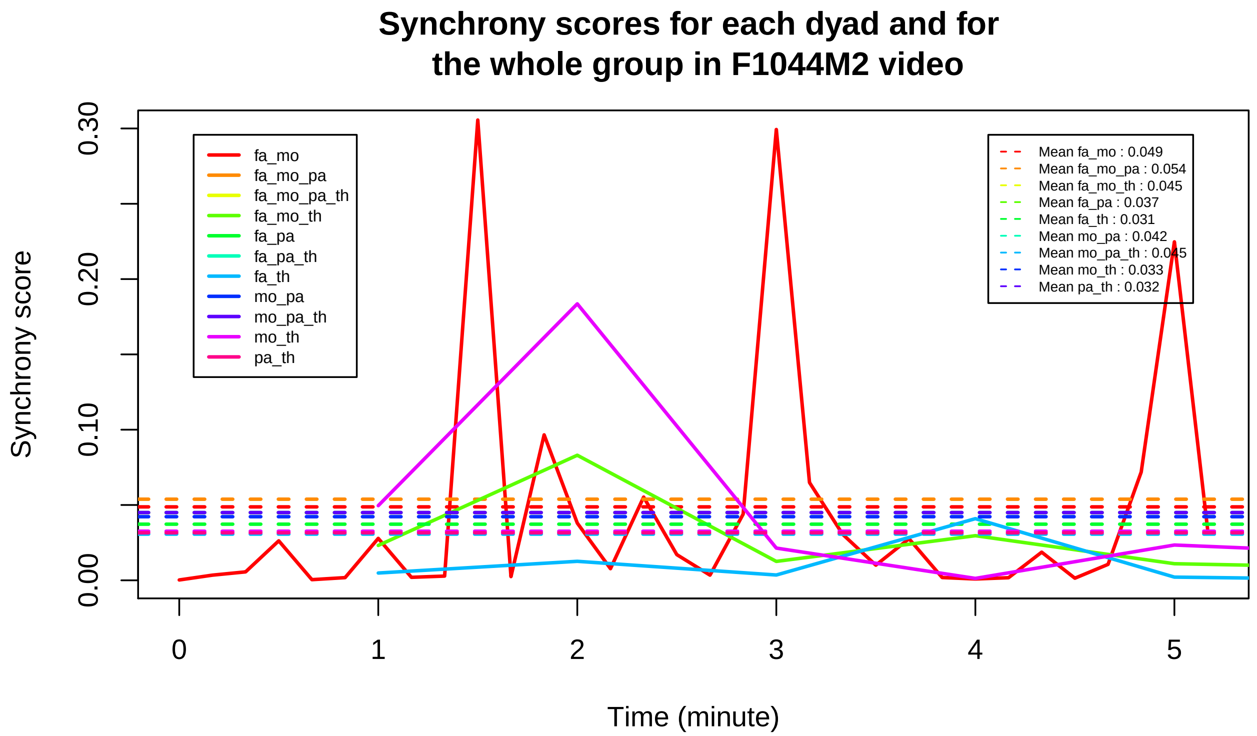

Synchrony scores for each dyad and for the whole group in F1044L1 video

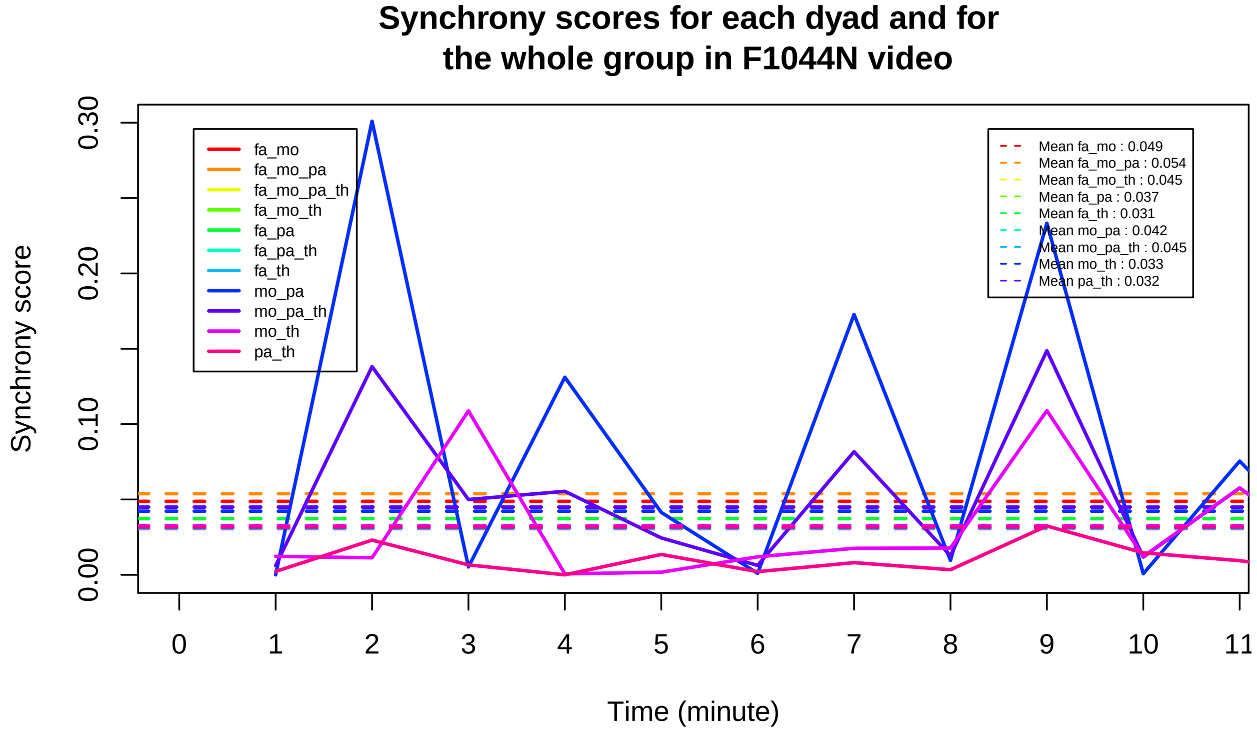
Synchrony scores for each dyad and for
the whole group in F1044L2 video



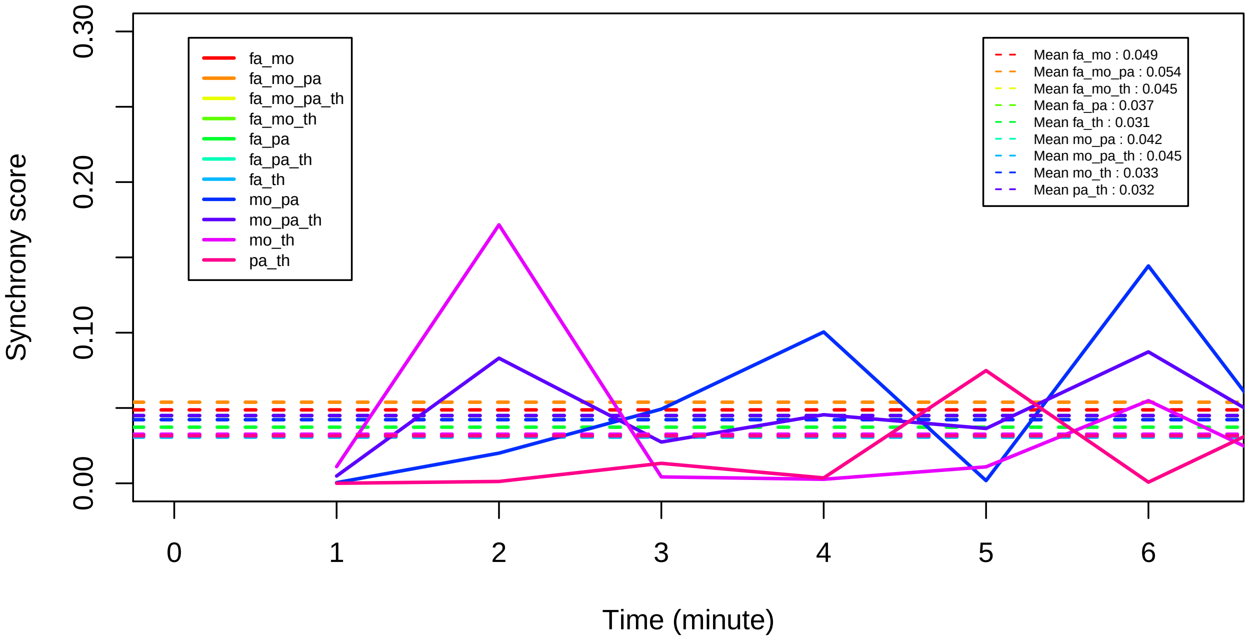
Synchrony scores for each dyad and for
the whole group in F1044M1 video



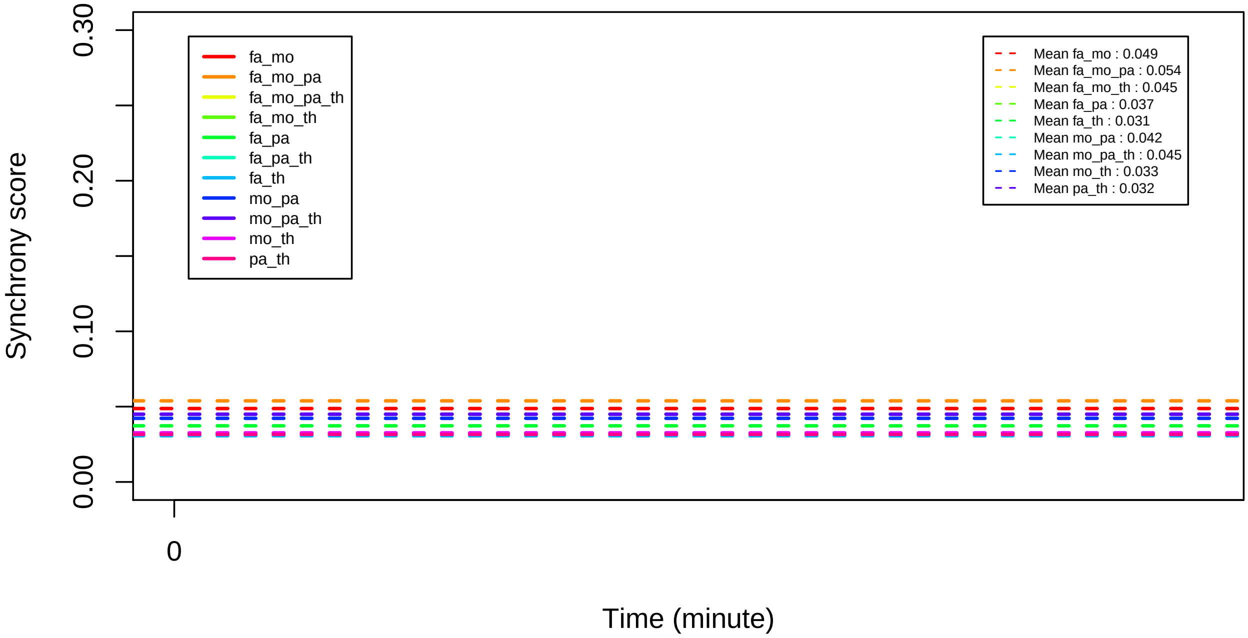

Synchrony scores for each dyad and for
the whole group in F1044M2 video
Synchrony score
0.00
0.10
0.20
0.30
Time (minute)
0
1
2
3
4
5
fa_mo
fa_mo_pa
fa_mo_pa_th
fa_mo_th
fa_pa
fa_pa_th
fa_th
mo_pa
mo_pa_th
mo_th
pa_th
Mean fa_mo : 0.049
Mean fa_mo_pa : 0.054
Mean fa_mo_th : 0.045
Mean fa_pa : 0.037
Mean fa_th : 0.031
Mean mo_pa : 0.042
Mean mo_pa_th : 0.045
Mean mo_th : 0.033
Mean pa_th : 0.032

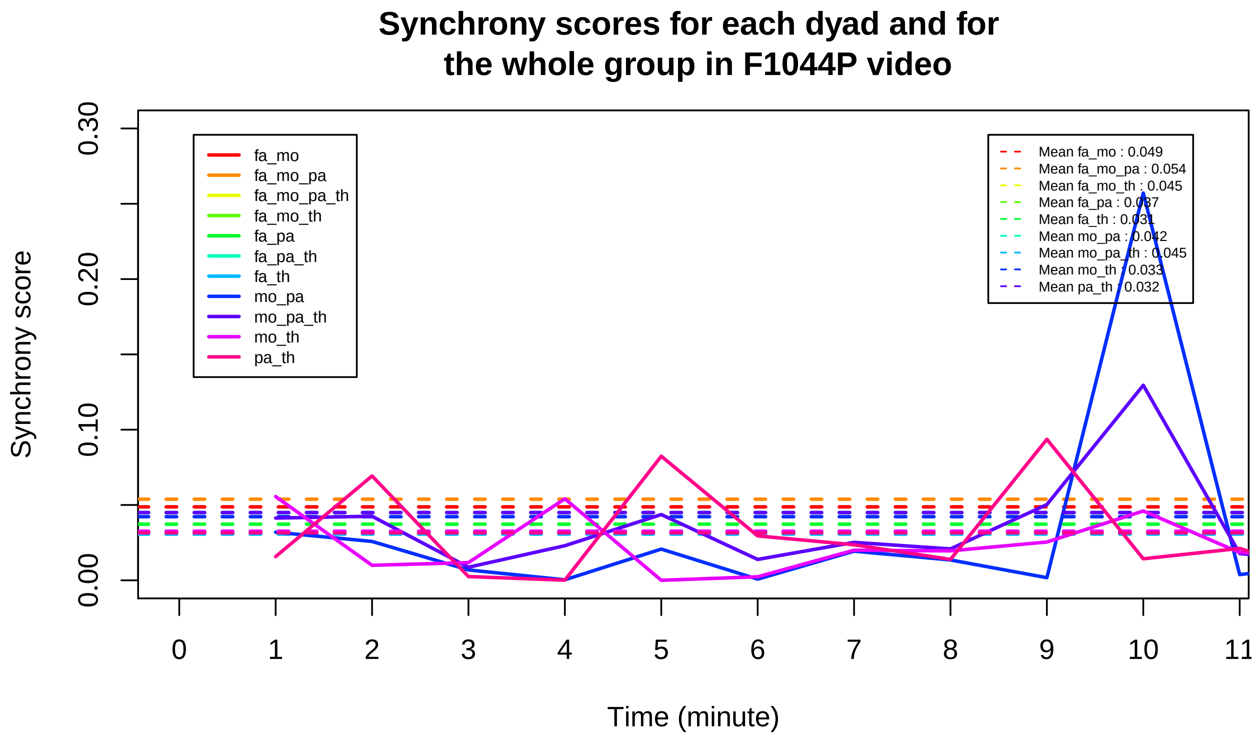

Synchrony scores for each dyad and for
the whole group in F1044N video
Synchrony score
0.00
0.10
0.20
0.30
Time (minute)
0
1
2
3
4
5
6
7
8
9
10
11
fa_mo
fa_mo_pa
fa_mo_pa_th
fa_mo_th
fa_pa
fa_pa_th
fa_th
mo_pa
mo_pa_th
mo_th
pa_th
Mean fa_mo : 0.049
Mean fa_mo_pa : 0.054
Mean fa_mo_th : 0.045
Mean fa_pa : 0.037
Mean fa_th : 0.031
Mean mo_pa : 0.042
Mean mo_pa_th : 0.045
Mean mo_th : 0.033
Mean pa_th : 0.032

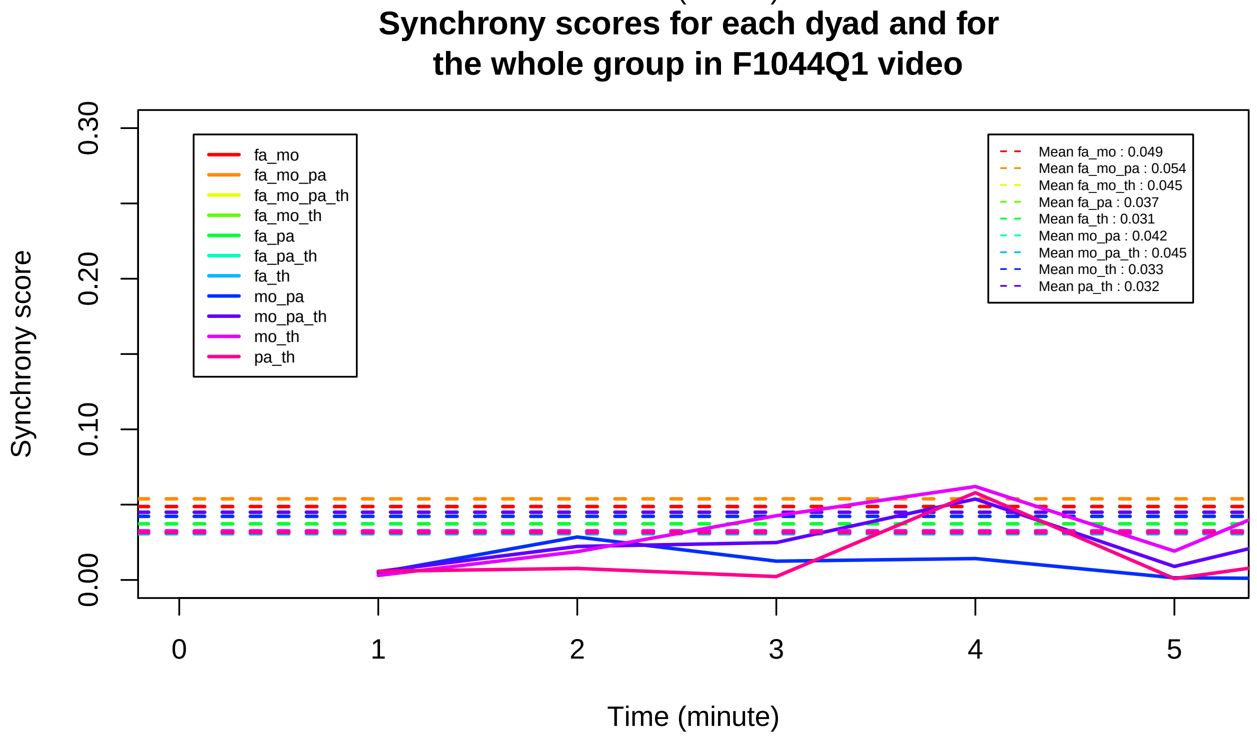
Synchrony scores for each dyad and for the whole group in F1044O1 video



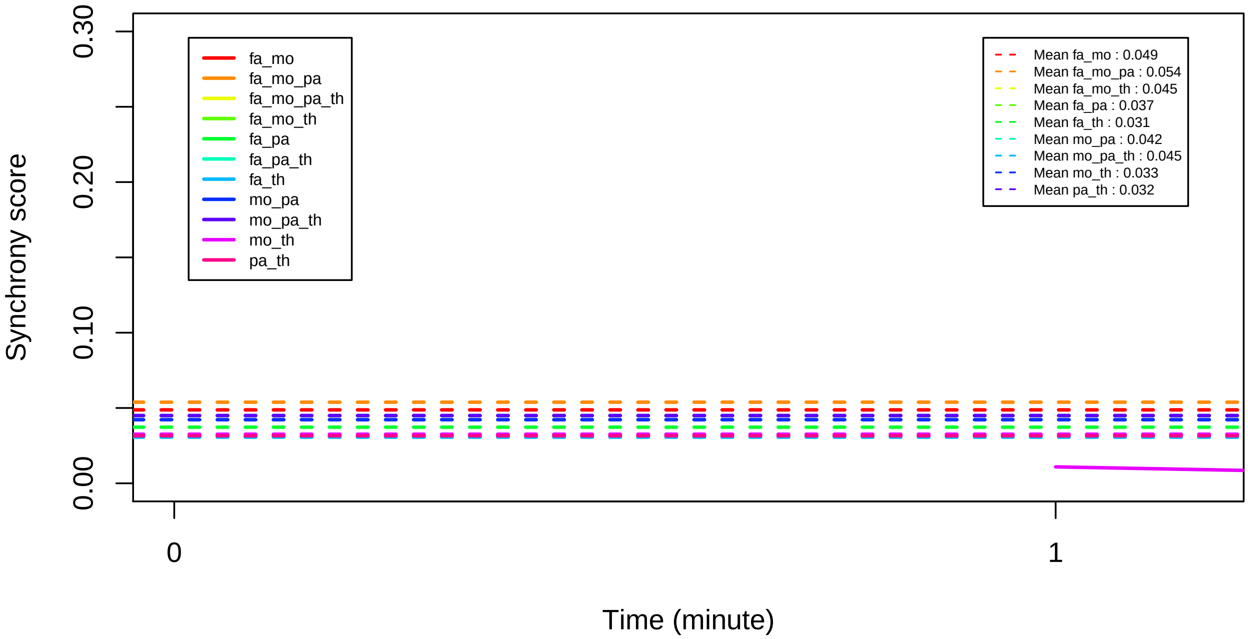
Synchrony scores for each dyad and for the whole group in F1044O2 video



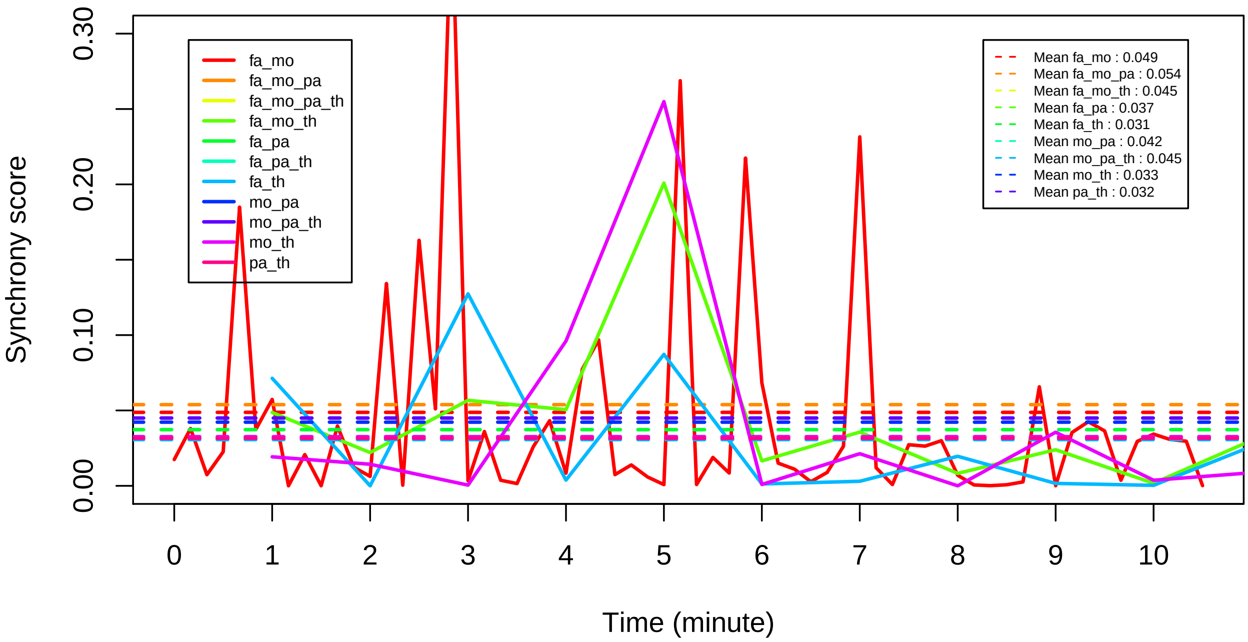

Synchrony scores for each dyad and for the whole group in F1044P video

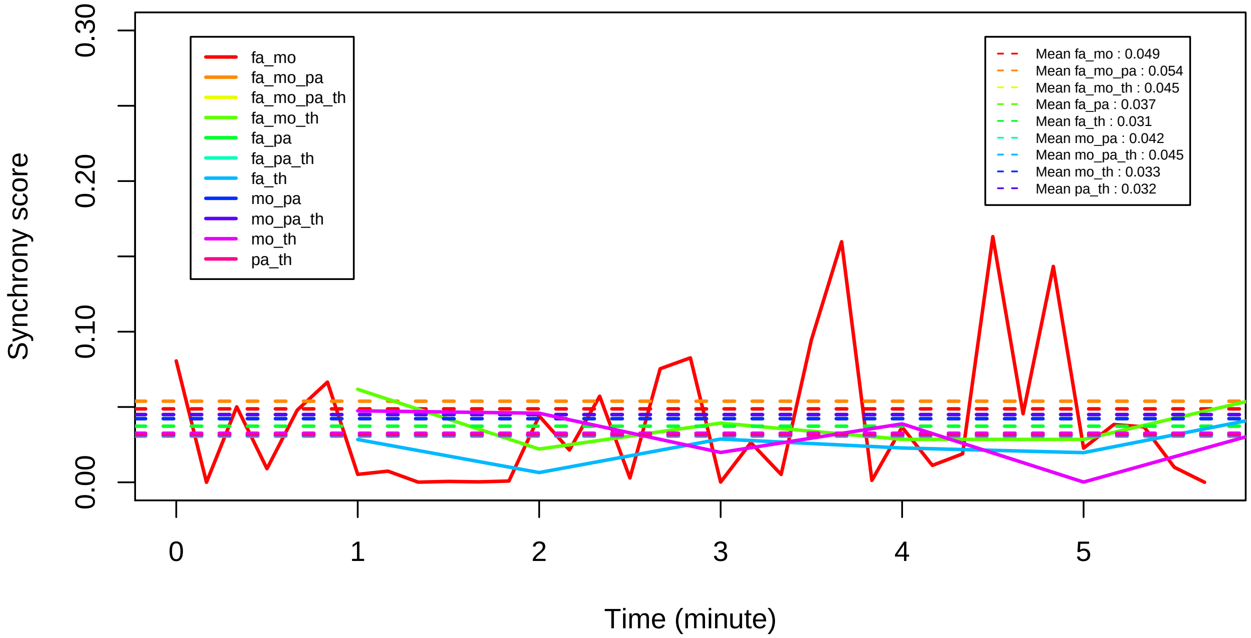

Synchrony scores for each dyad and for the whole group in F1044Q1 video

Synchrony scores for each dyad and for the whole group in F1044Q2 video

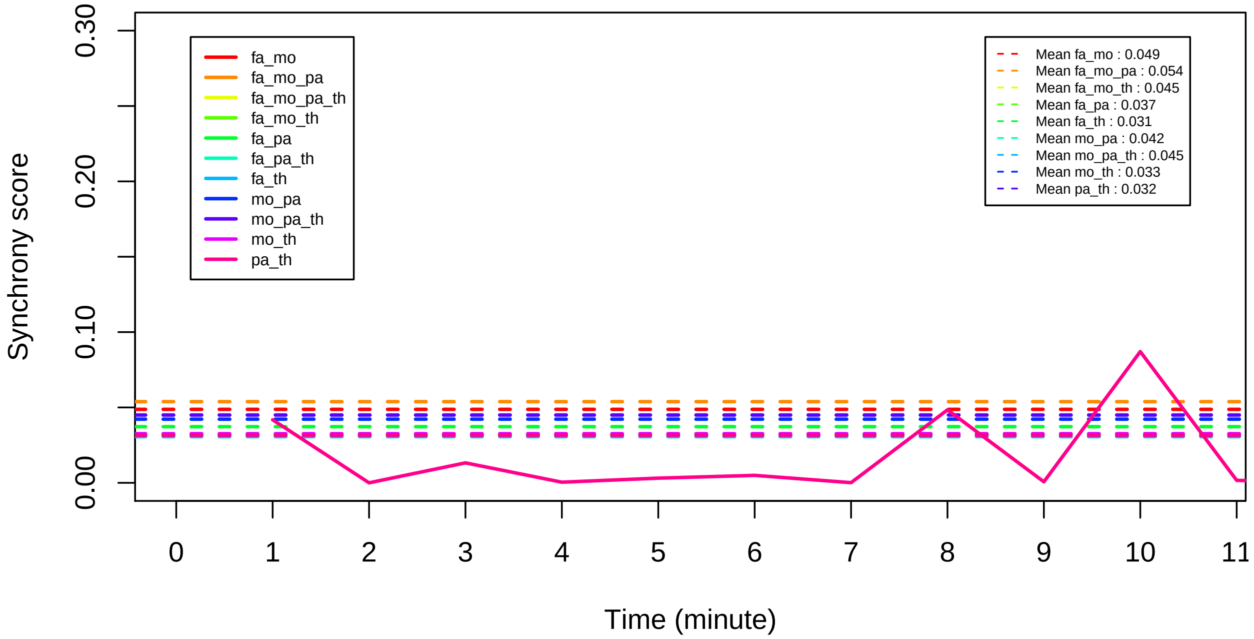


Synchrony scores for each dyad and for the whole group in F1044R1 video



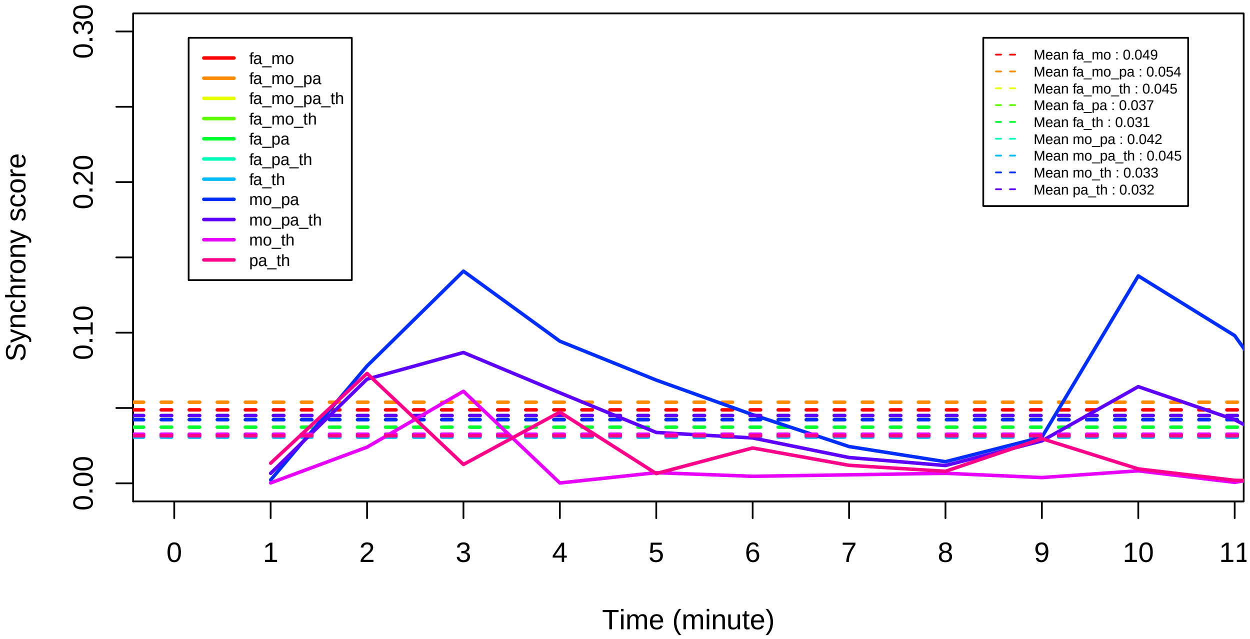


Synchrony scores for each dyad and for the whole group in F1044R2 video

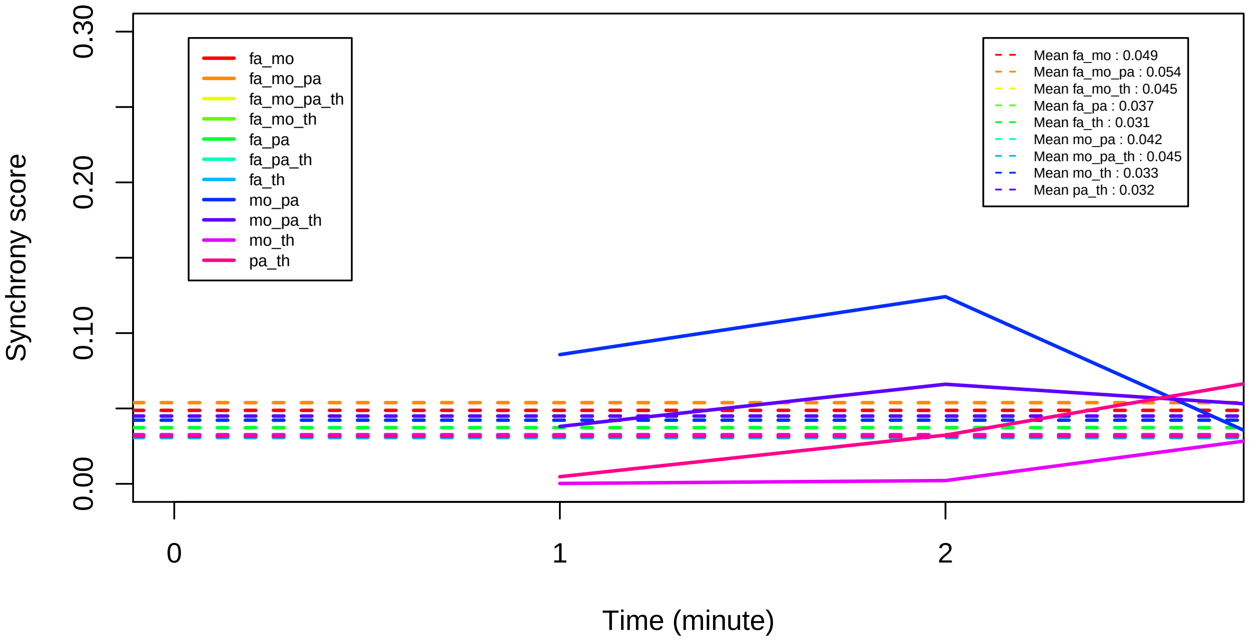


Synchrony scores for each dyad and for the whole group in F1069A1 video

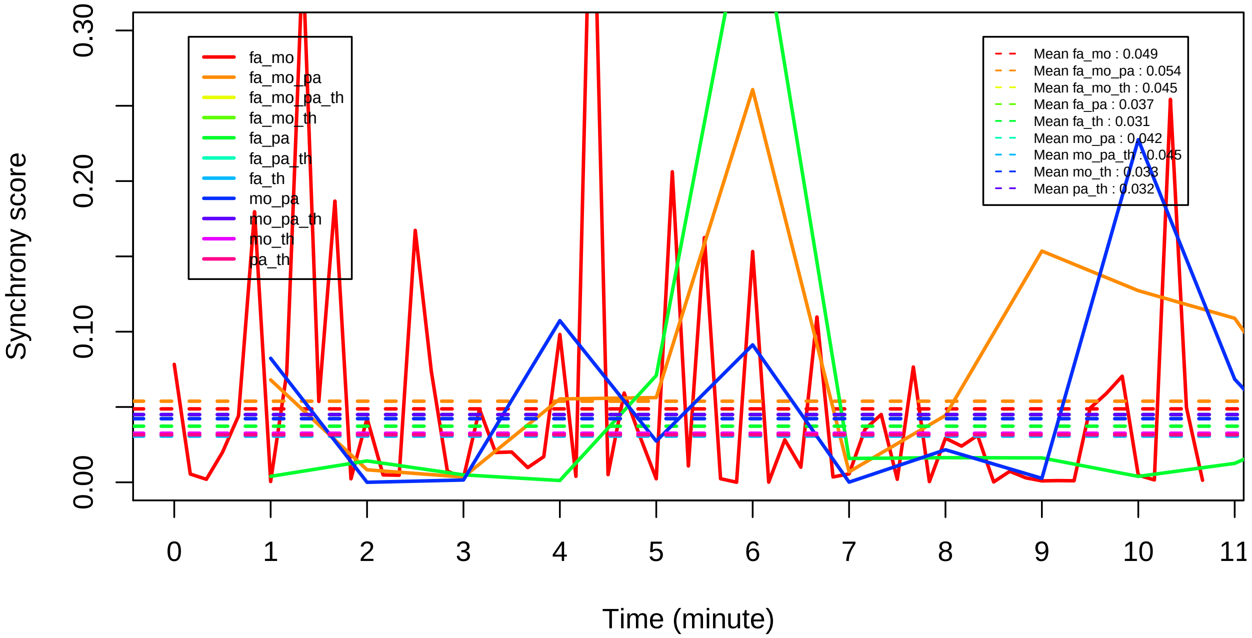
Synchrony scores for each dyad and for the whole group in F1069B1 video



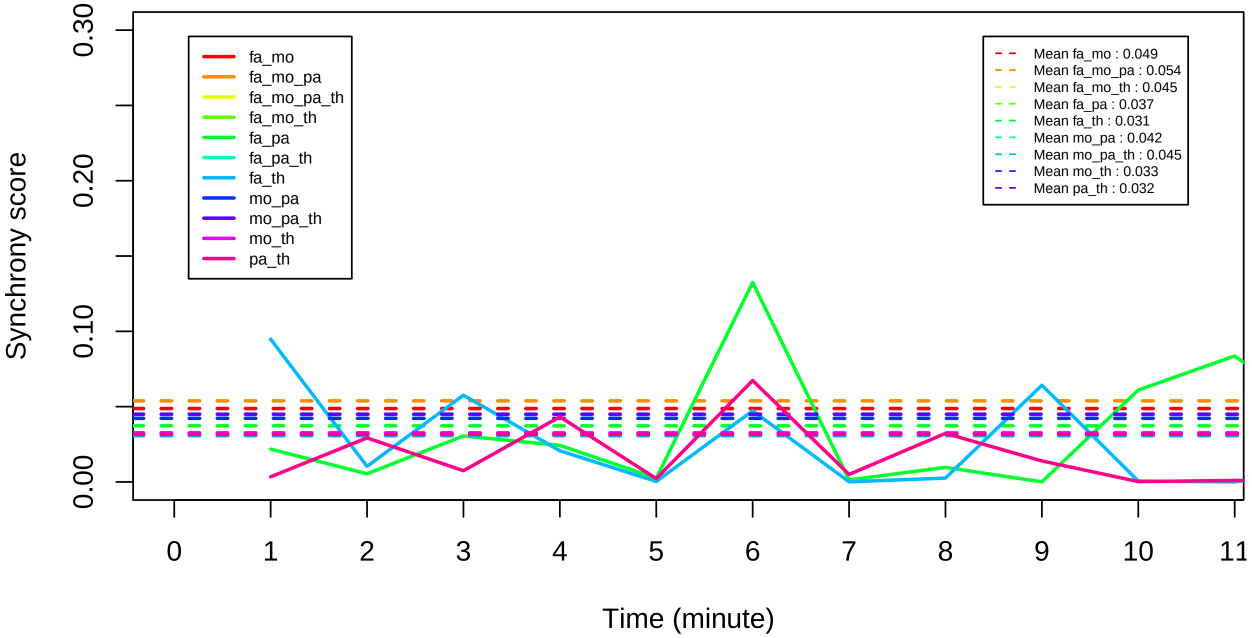
Synchrony scores for each dyad and for the whole group in F1069B2 video

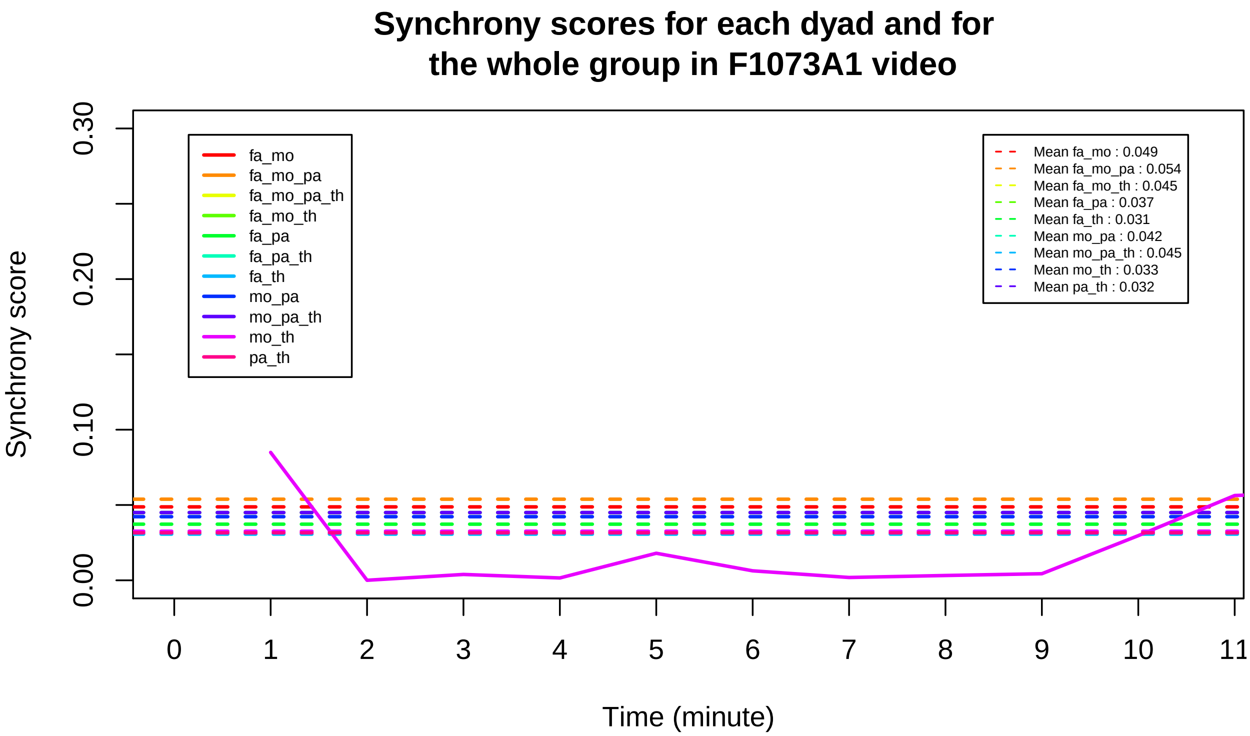


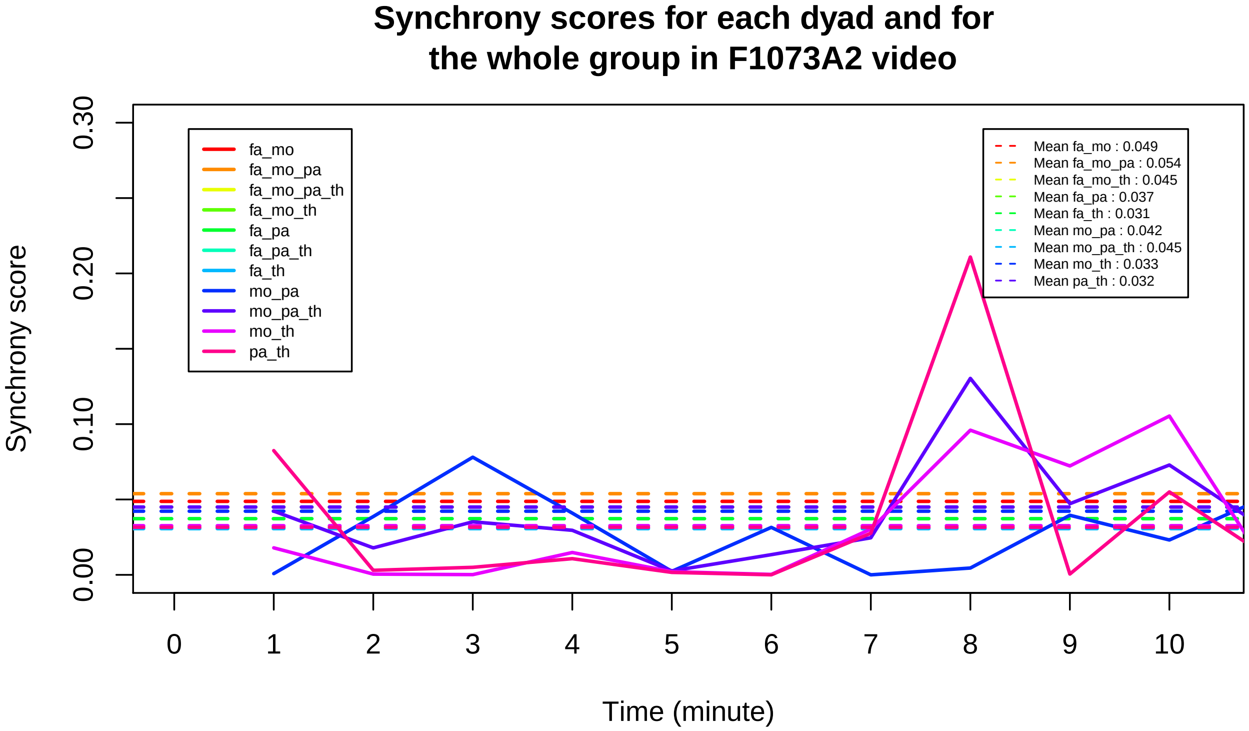
Synchrony scores for each dyad and for the whole group in F1069C1 video

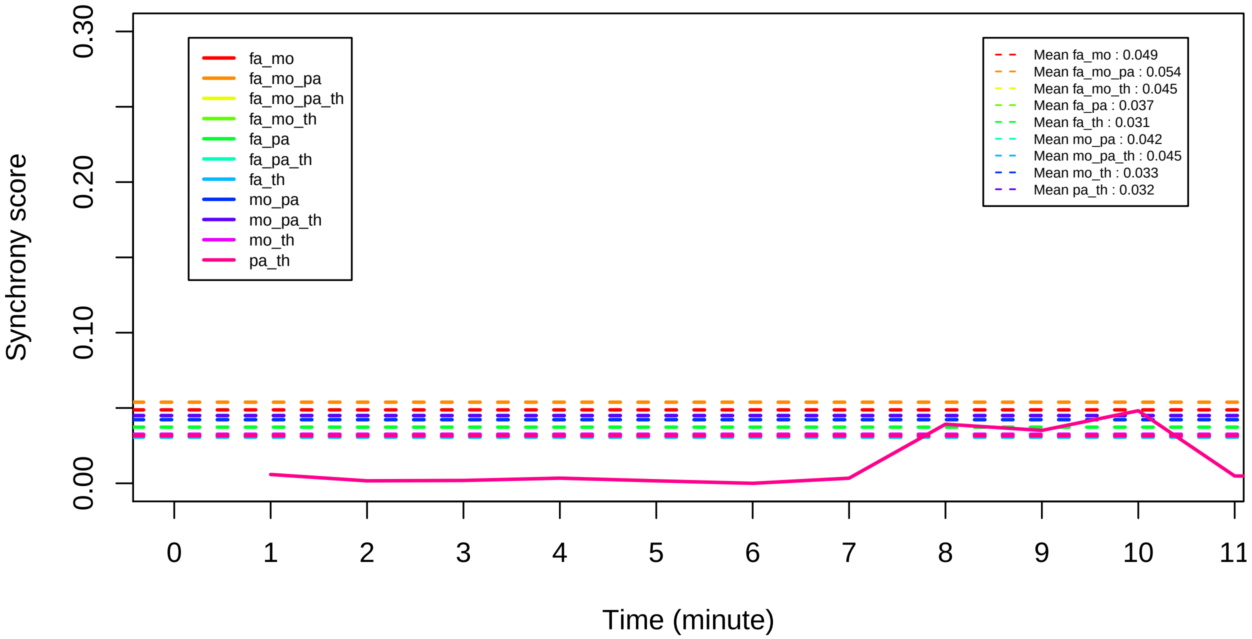


Synchrony scores for each dyad and for the whole group in F1069D2 video

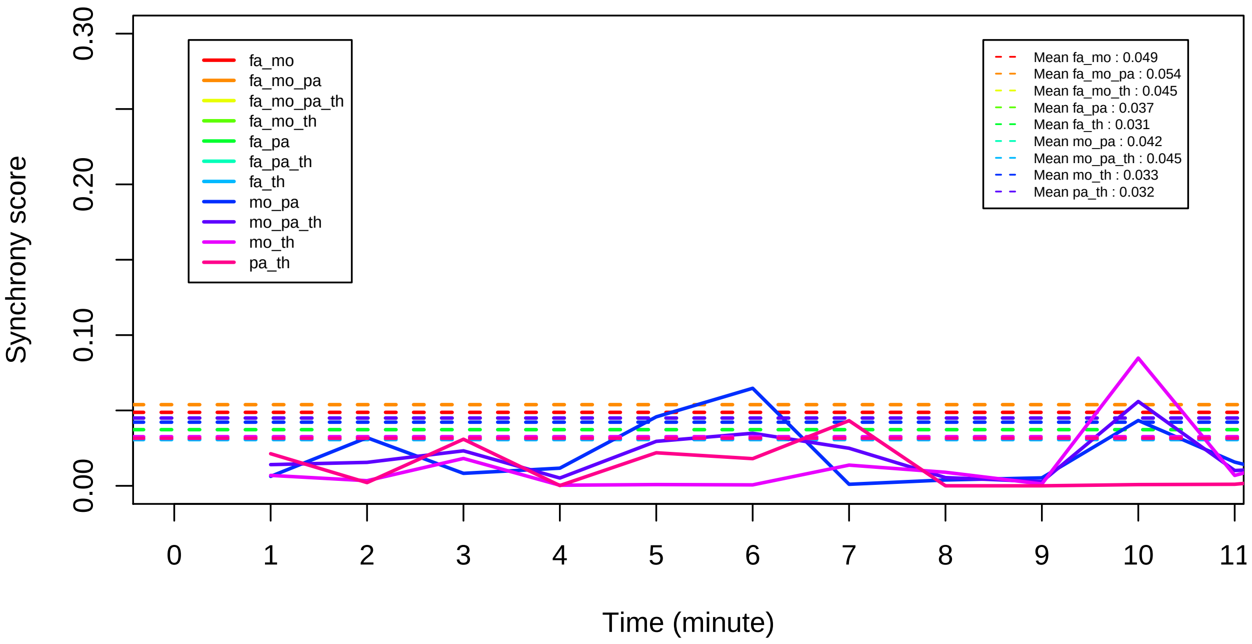



Synchrony scores for each dyad and for the whole group in F1073A1 video

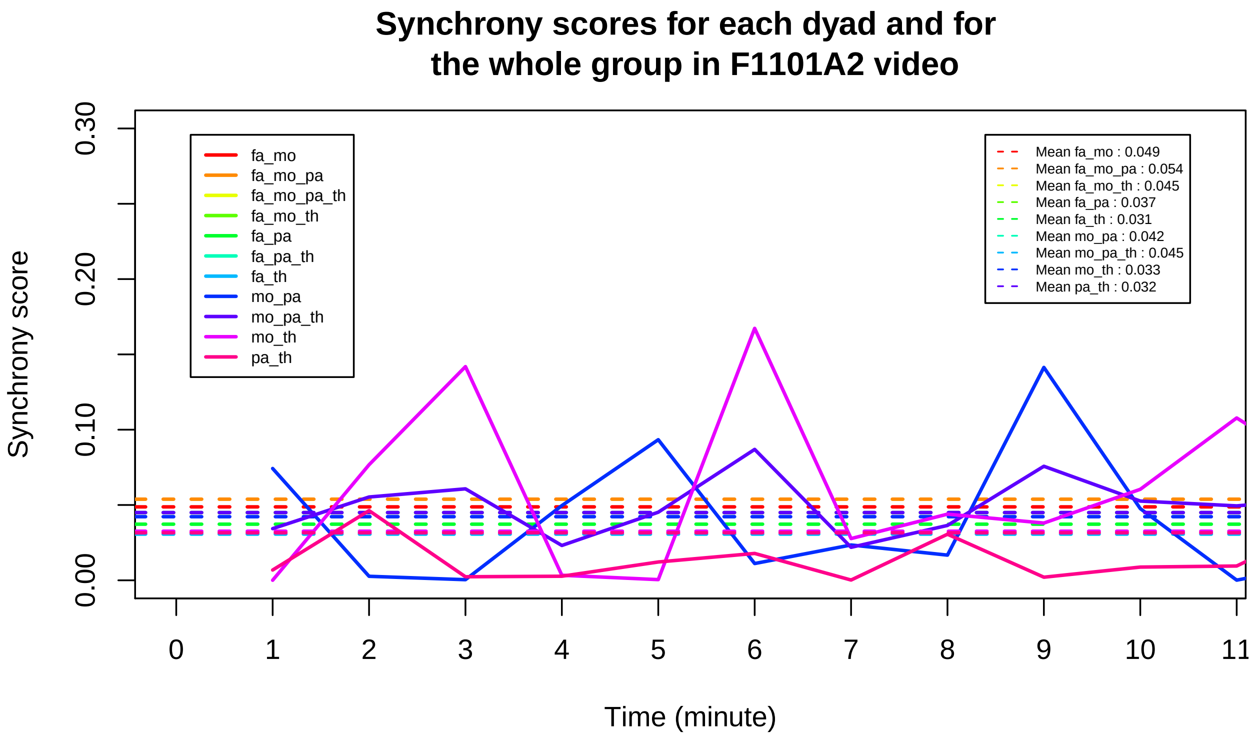

Synchrony scores for each dyad and for the whole group in F1073A2 video

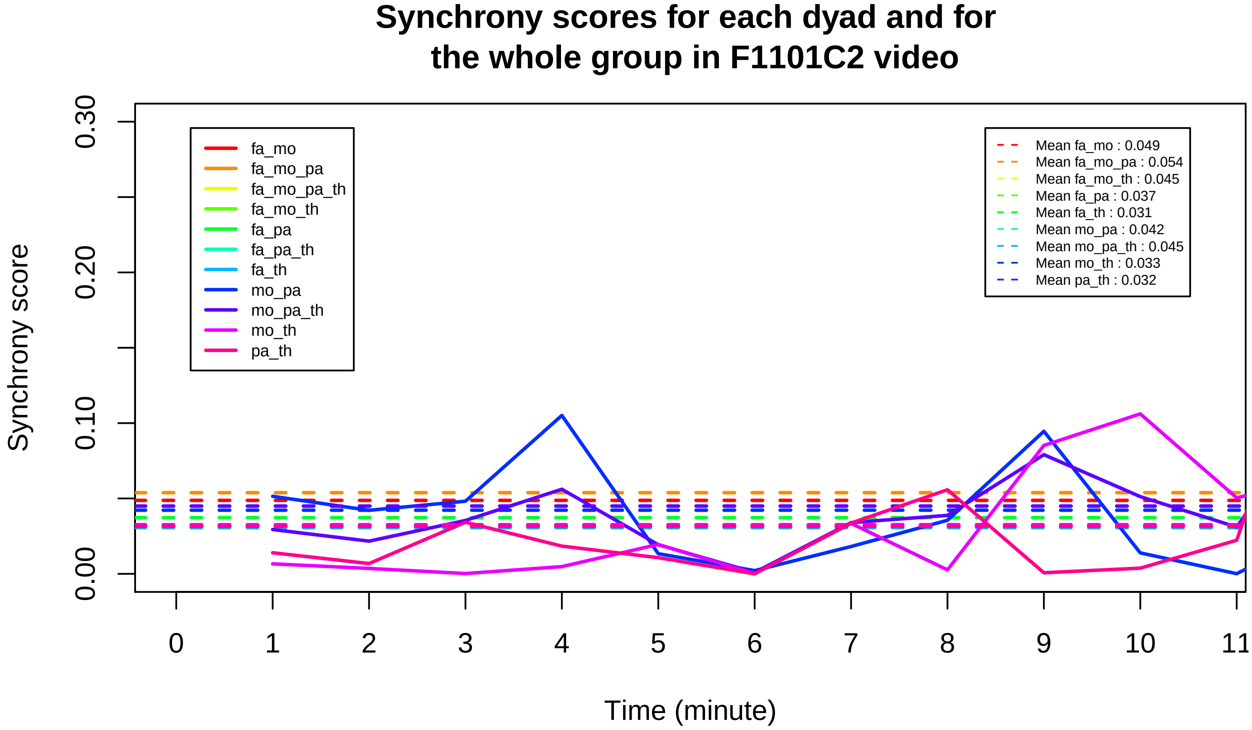


Synchrony scores for each dyad and for the whole group in F1073B1 video



Synchrony scores for each dyad and for the whole group in F1073B2 video



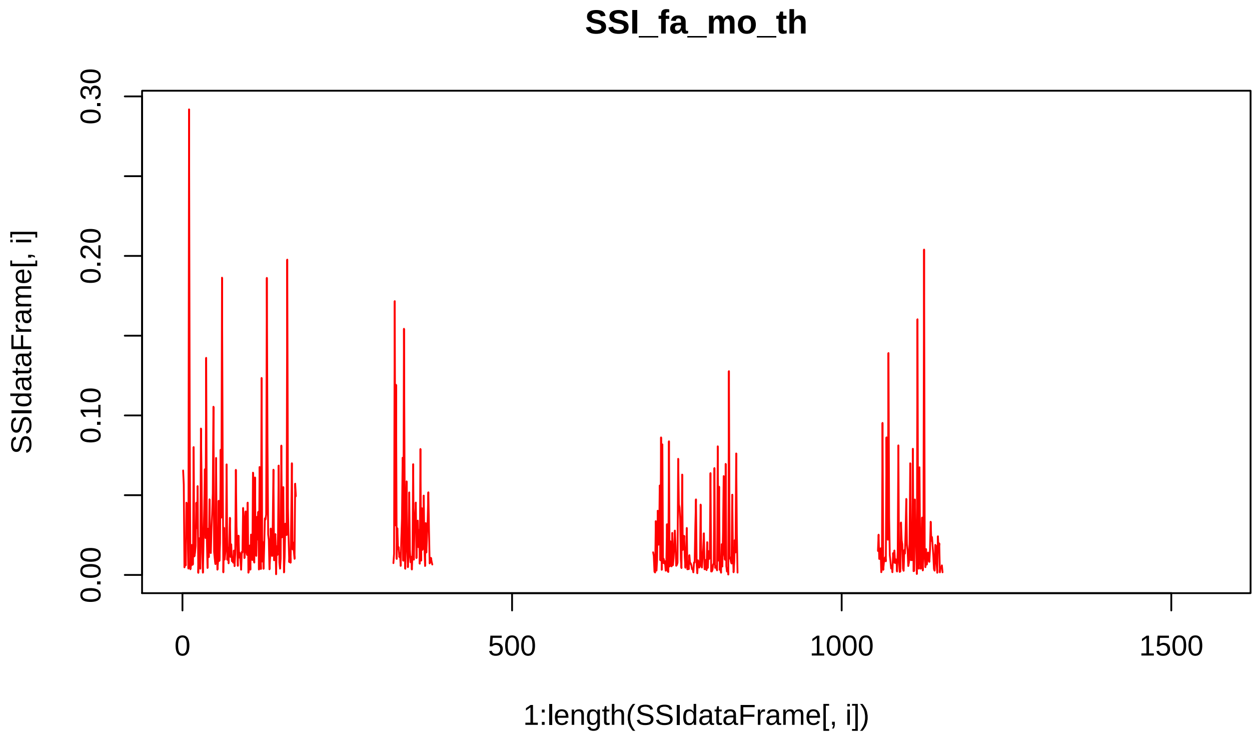


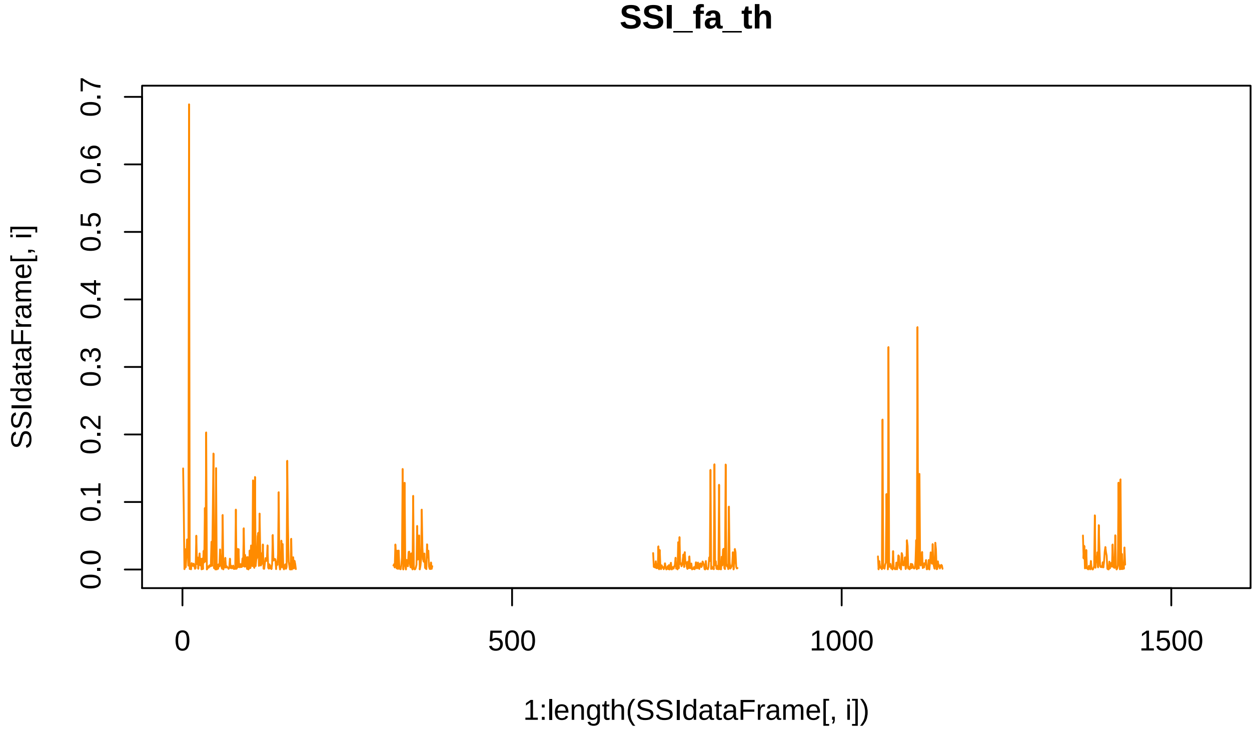
Evolution of synchrony through time, raw each second

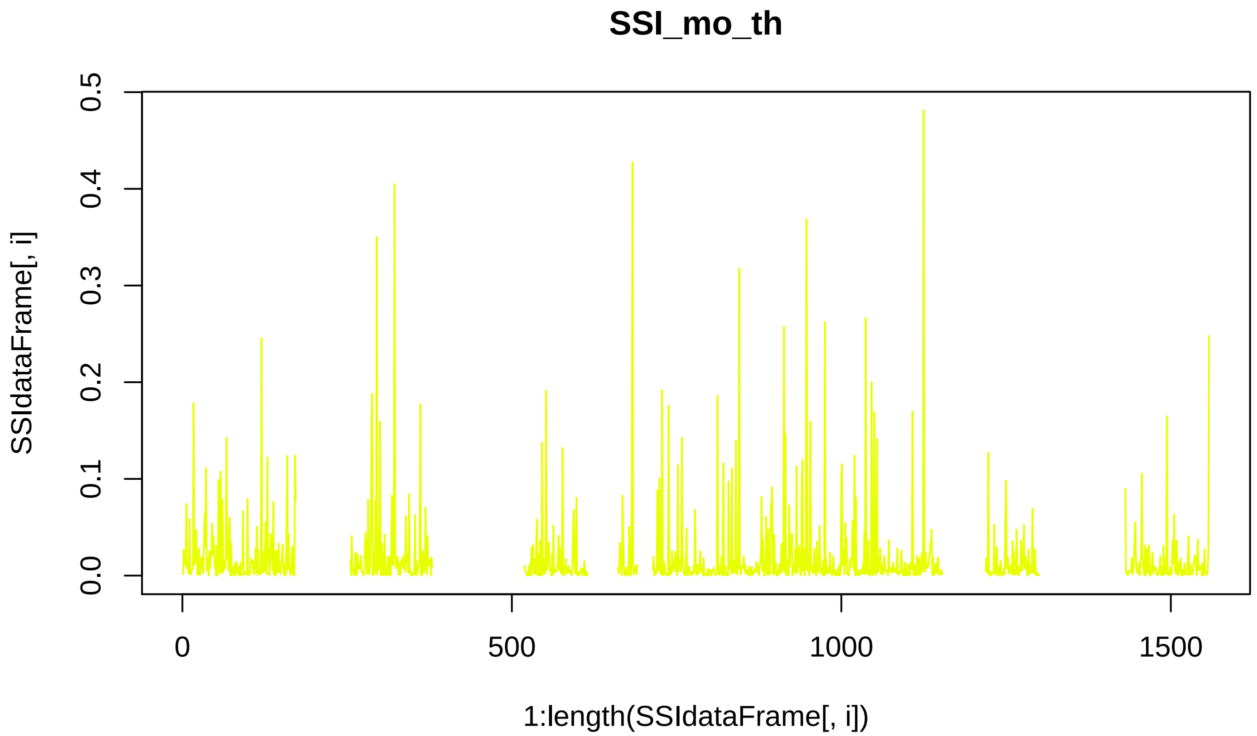
Nolog data

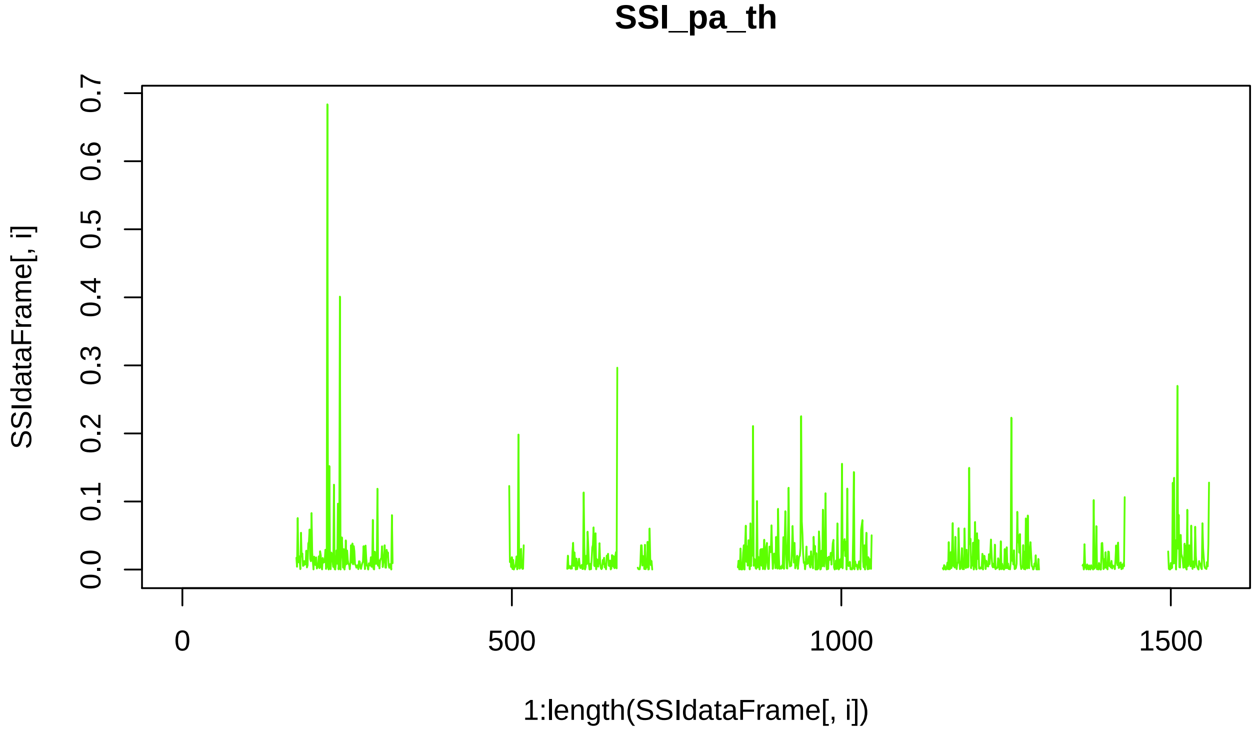
```
par(mar=c(4,4,4,4))
    col <- 1
```

```
for (i in 6:length(SSIdataFrame)){
    plot(1:length(SSIdataFrame[,i]), SSIdataFrame[,i], type="l",
    col=rainbow(11)[col], main = names(SSIdataFrame)[i])
    col <- col+1}
```

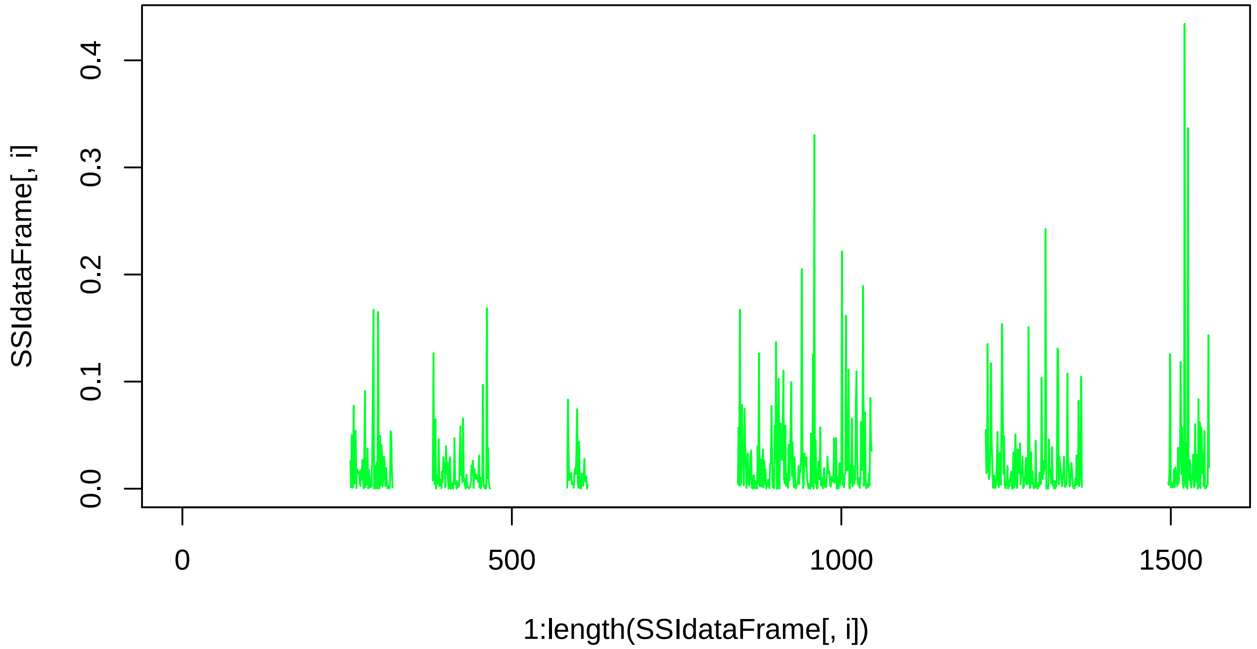




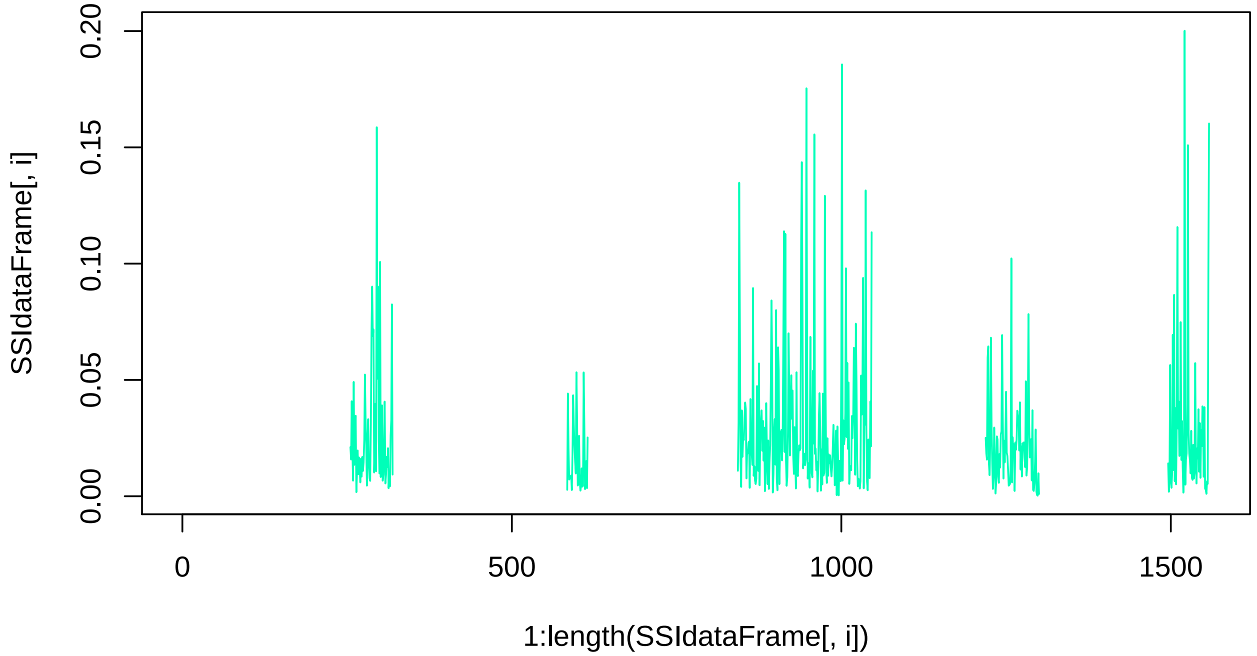

SSI_mo_th

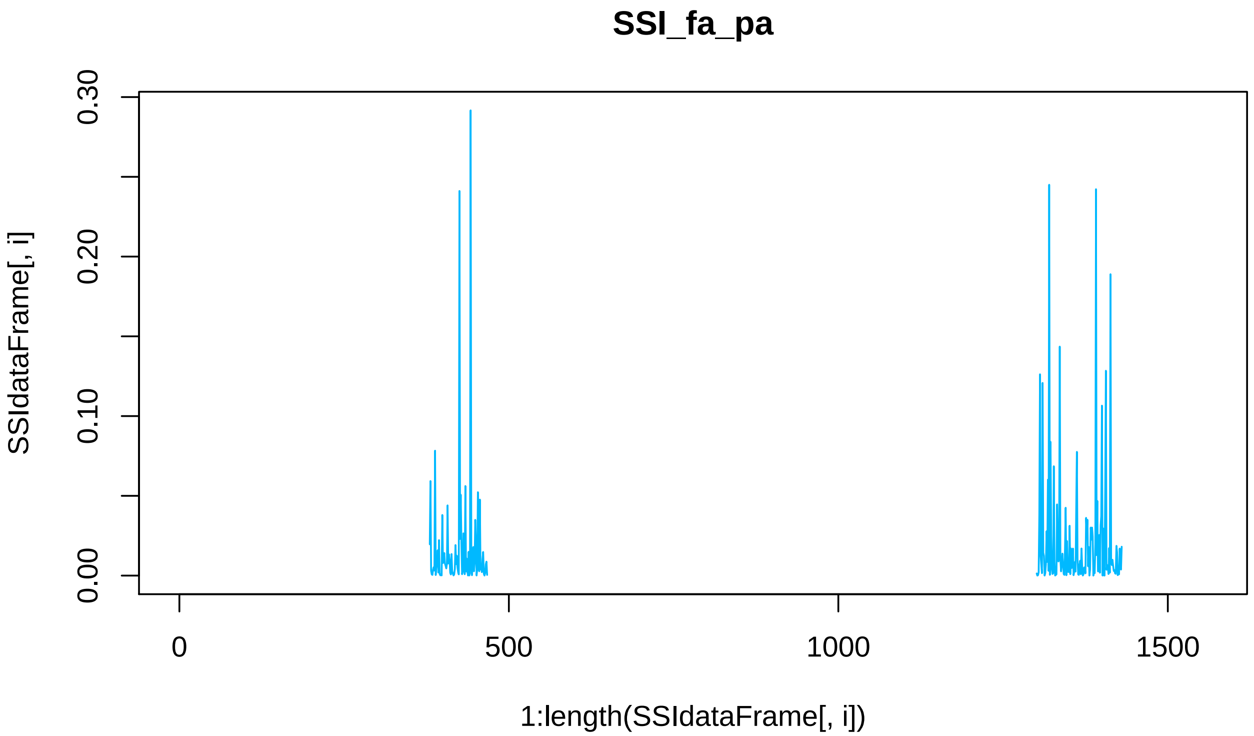

SSI_pa_th

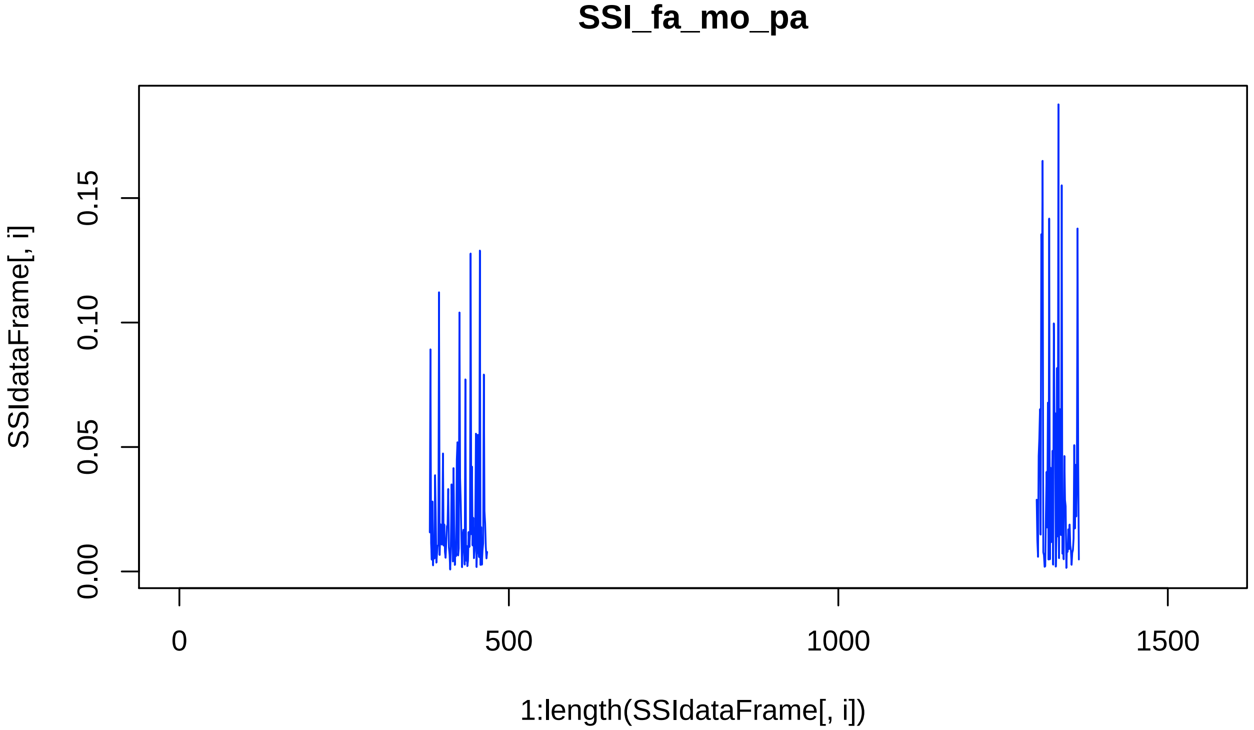
SSI_mo_pa

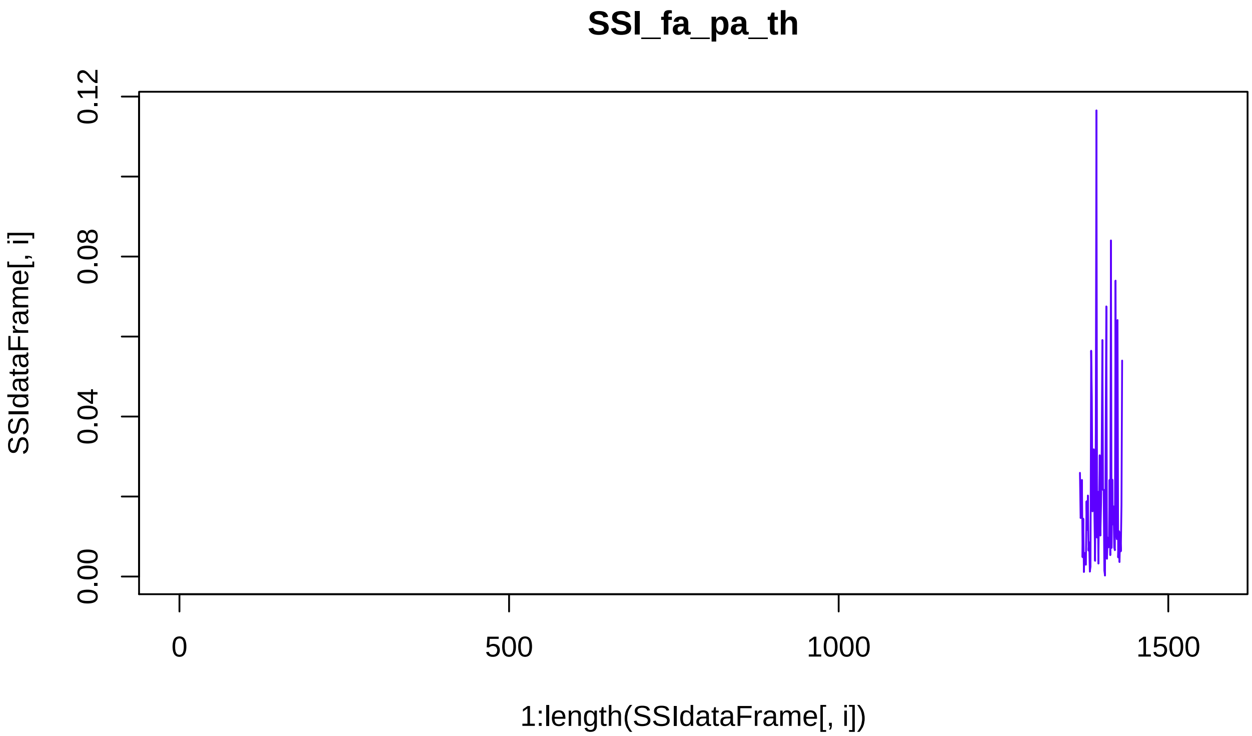


SSI_mo_pa_th



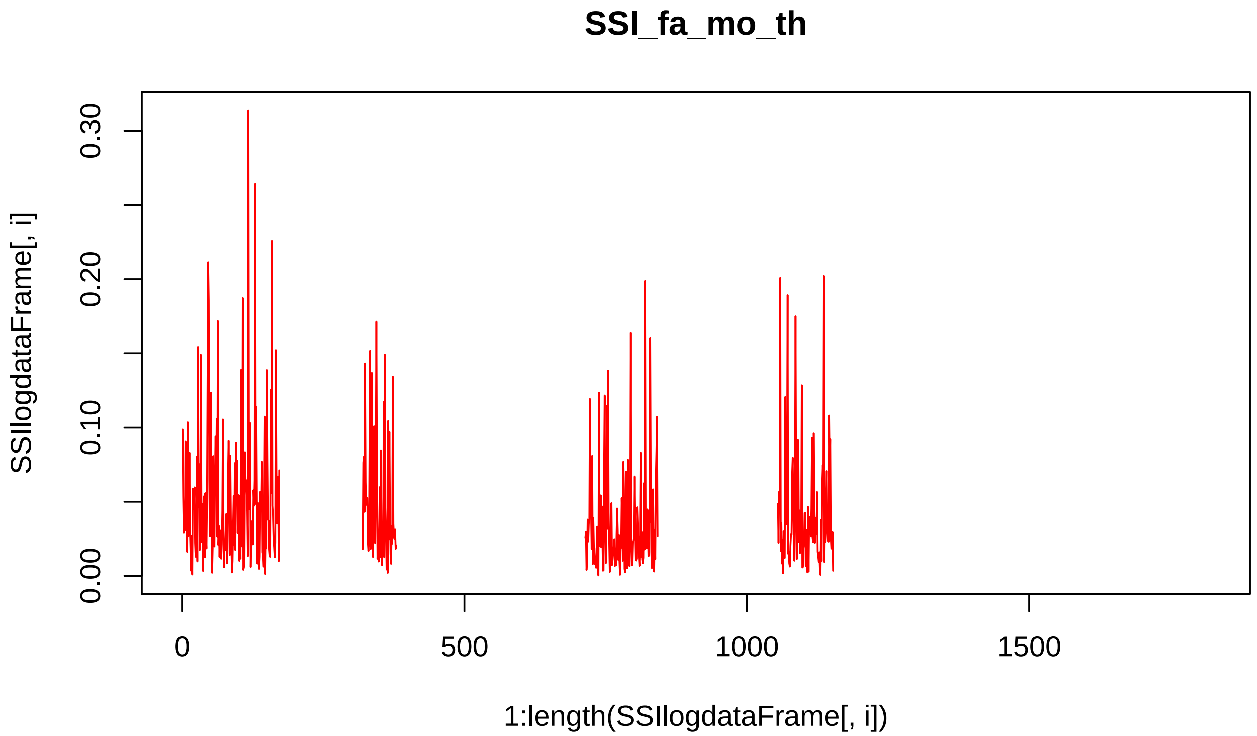

SSI_fa_pa
SSIdataFrame[, i]
0.00
0.10
0.20
0.30
0
500
1000
1500
1:length(SSIdataFrame[, i])

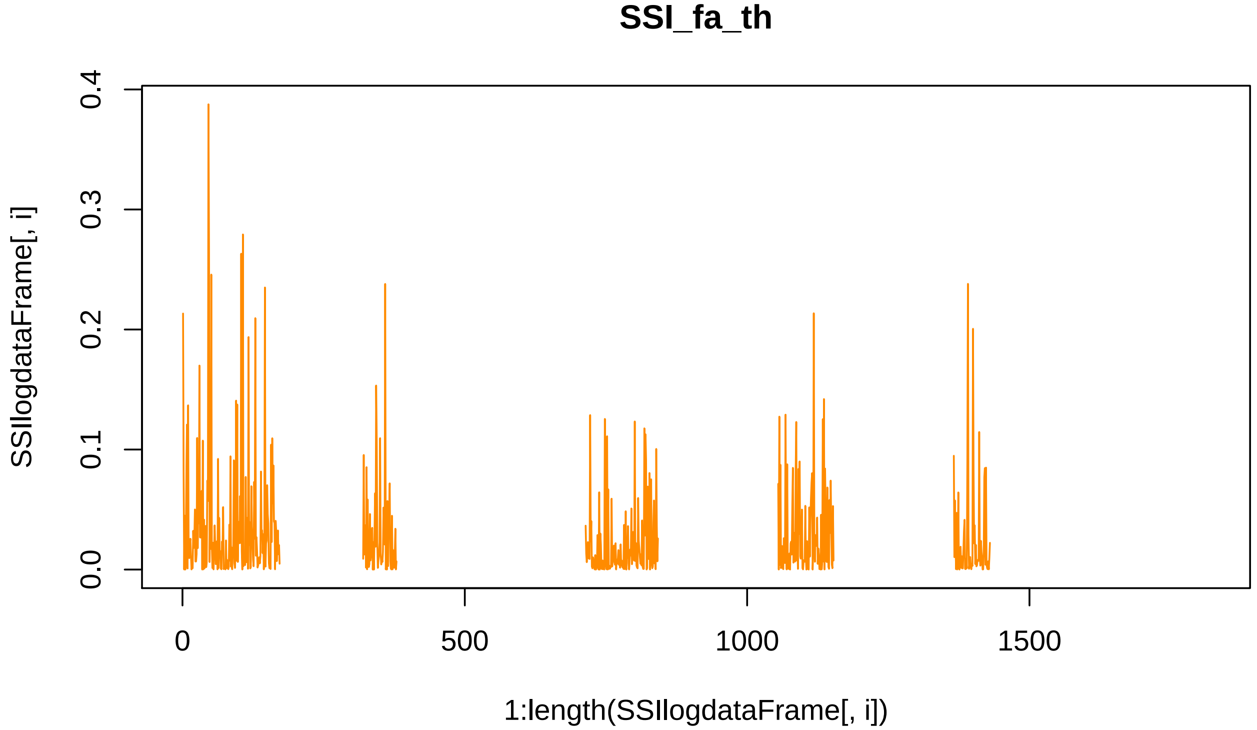

SSI_fa_mo_pa
SSIdataFrame[, i]
0.00
0.05
0.10
0.15
0
500
1000
1500
1:length(SSIdataFrame[, i])

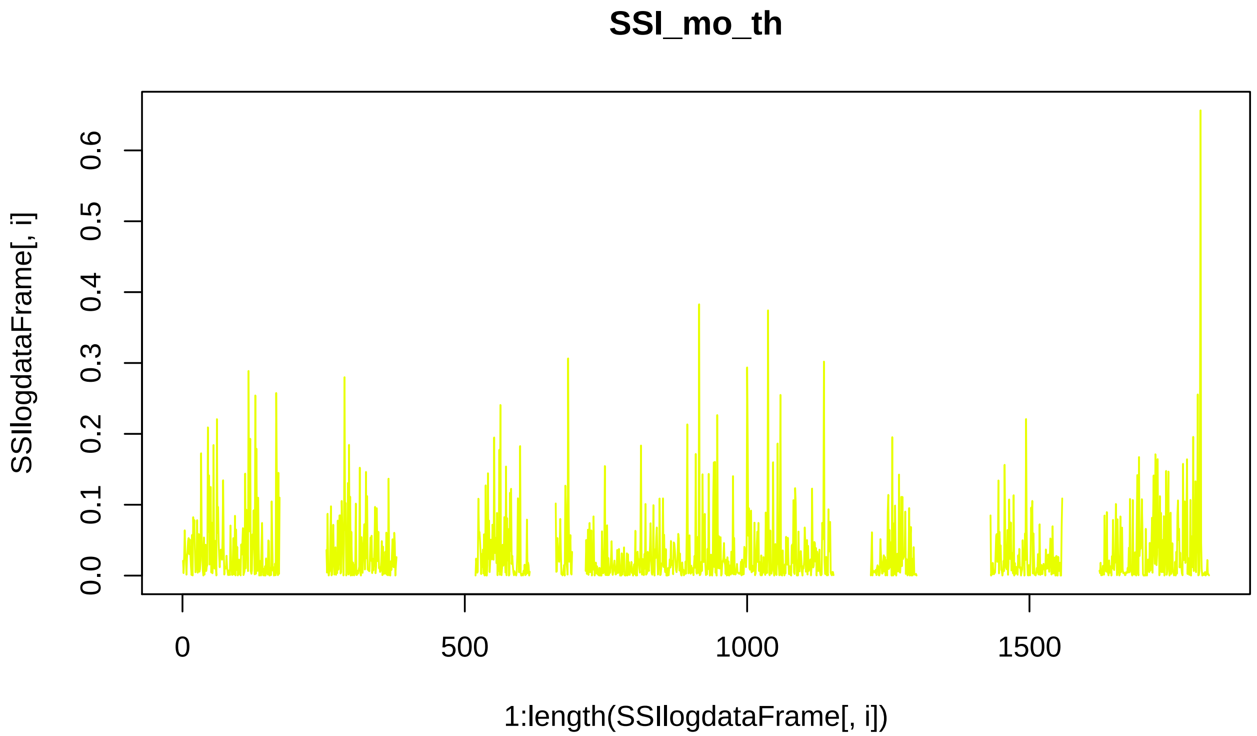


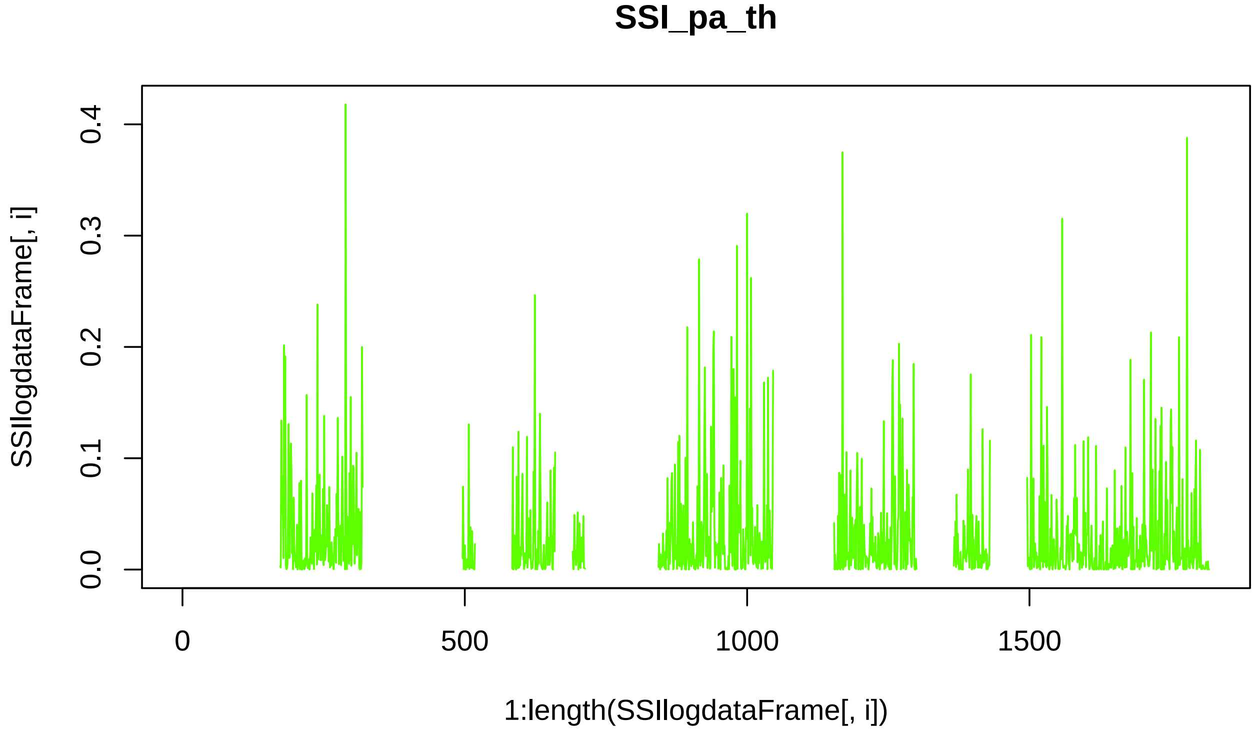
log data

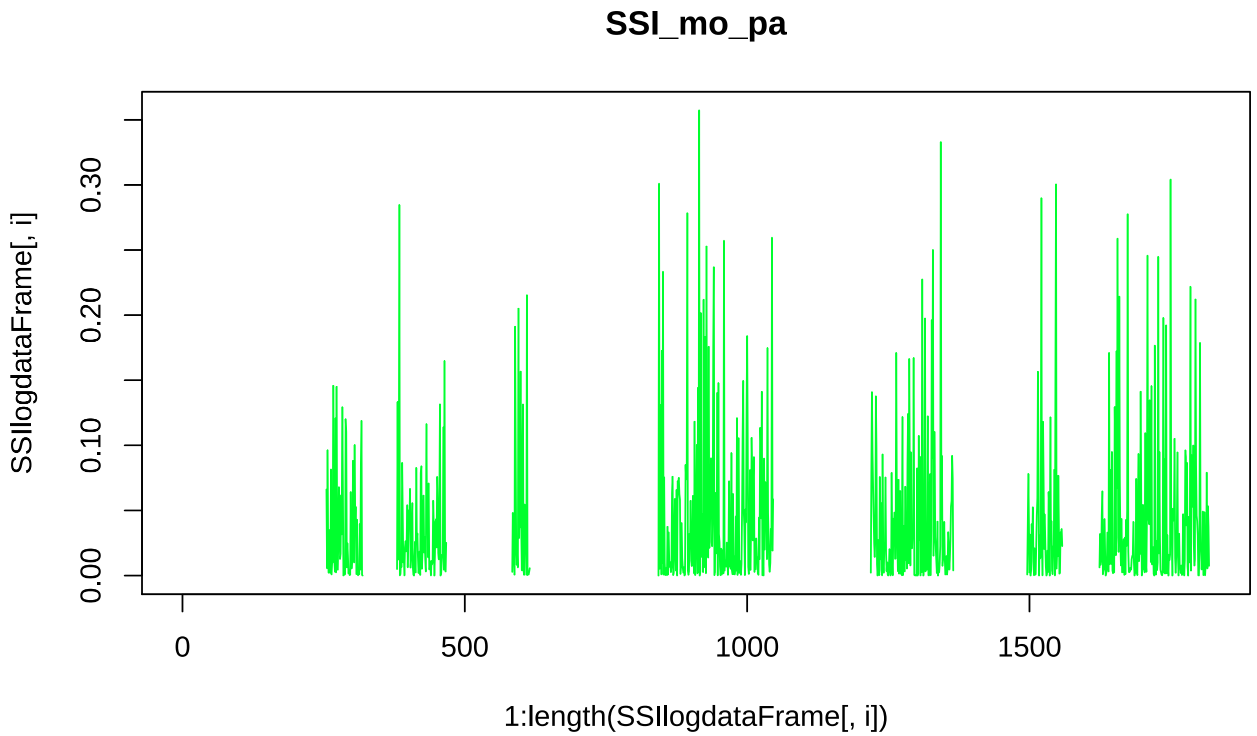
```
par(mar=c(4,4,4,4))
    col <- 1
for (i in 6:length(SSIlogdataFrame)){
    plot(1:length(SSIlogdataFrame[,i]), SSIlogdataFrame[,i], type="l",
    col=rainbow(11)[col], main = names(SSIlogdataFrame)[i])
    col <- col+1}
```

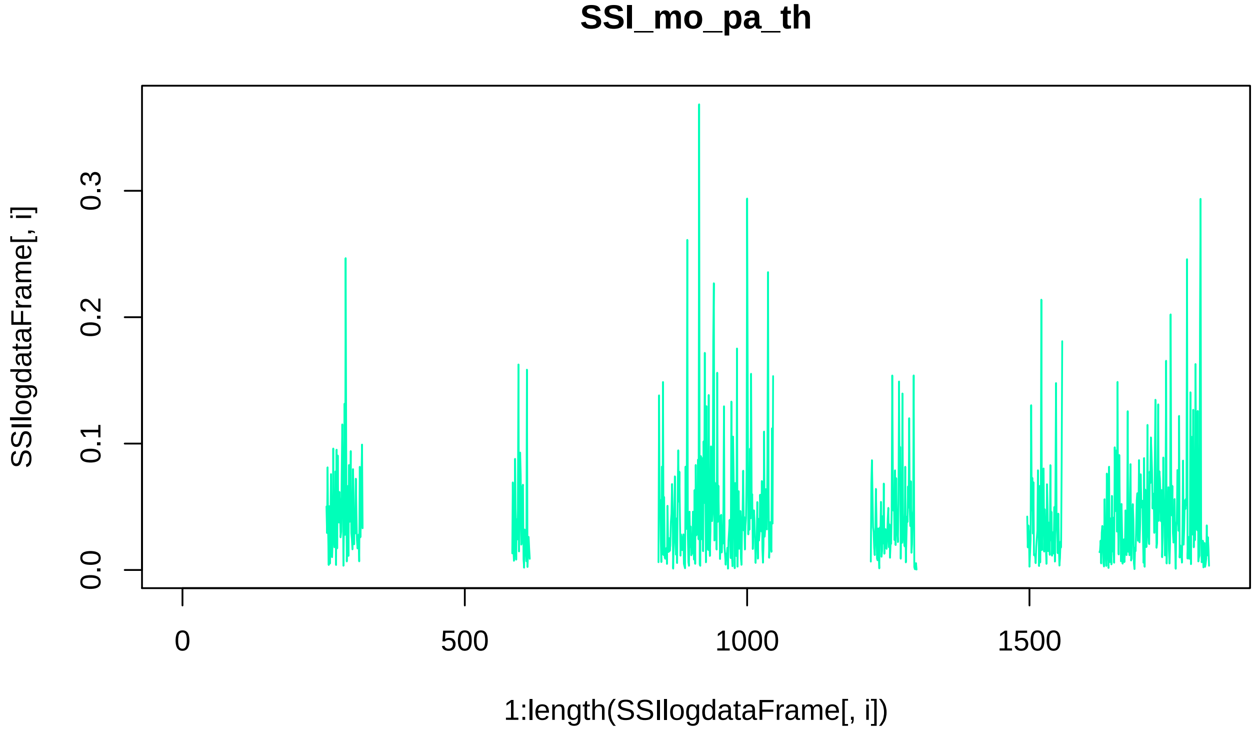

SSI_fa_mo_th
SSIlogdataFrame[, i]
0.00
0.10
0.20
0.30
0
500
1000
1500
1:length(SSIlogdataFrame[, i])


SSI_fa_th
SSIlogdataFrame[, i]
0.0
0.1
0.2
0.3
0.4
0
500
1000
1500
1:length(SSIlogdataFrame[, i])

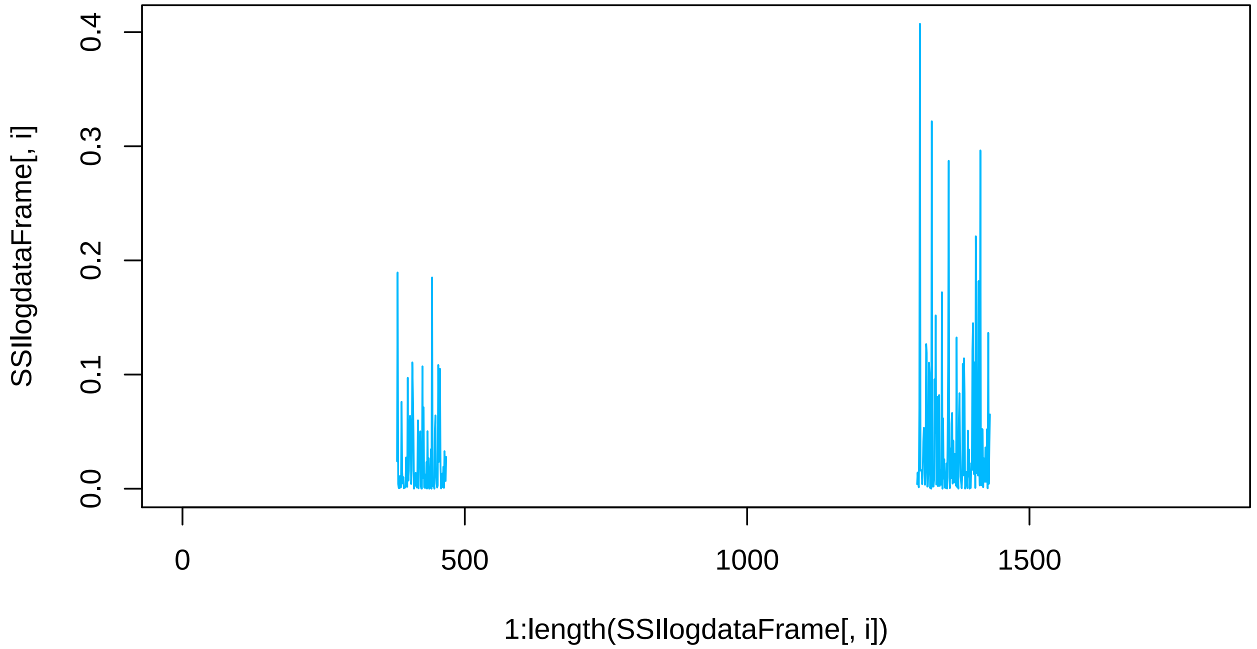

SSI_mo_th
SSIlogdataFrame[, i]
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0
500
1000
1500
1:length(SSIlogdataFrame[, i])


SSI_pa_th
SSIlogdataFrame[, i]
0.0
0.1
0.2
0.3
0.4
0
500
1000
1500
1:length(SSIlogdataFrame[, i])

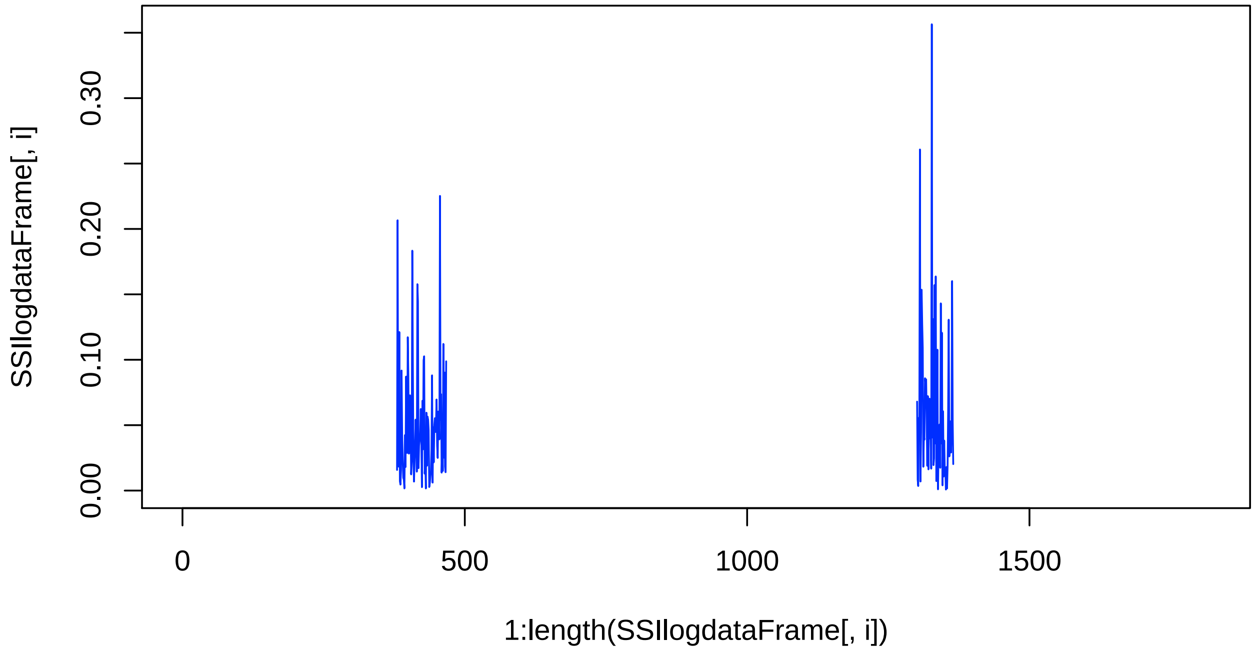

SSI_mo_pa
SSIlogdataFrame[, i]
0.00
0.10
0.20
0.30
0
500
1000
1500
1:length(SSIlogdataFrame[, i])

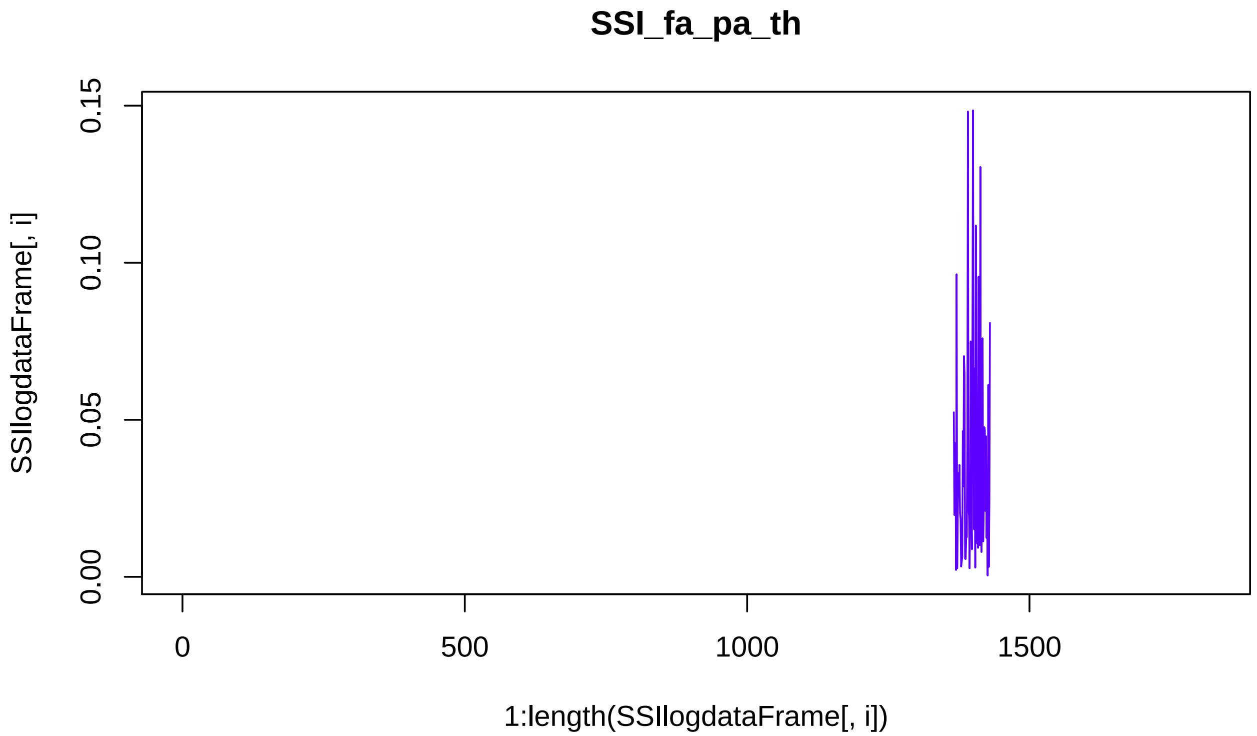

SSI_mo_pa_th
SSIlogdataFrame[, i]
0.0
0.1
0.2
0.3
0
500
1000
1500
1:length(SSIlogdataFrame[, i])

SSI_fa_pa



SSI_fa_mo_pa



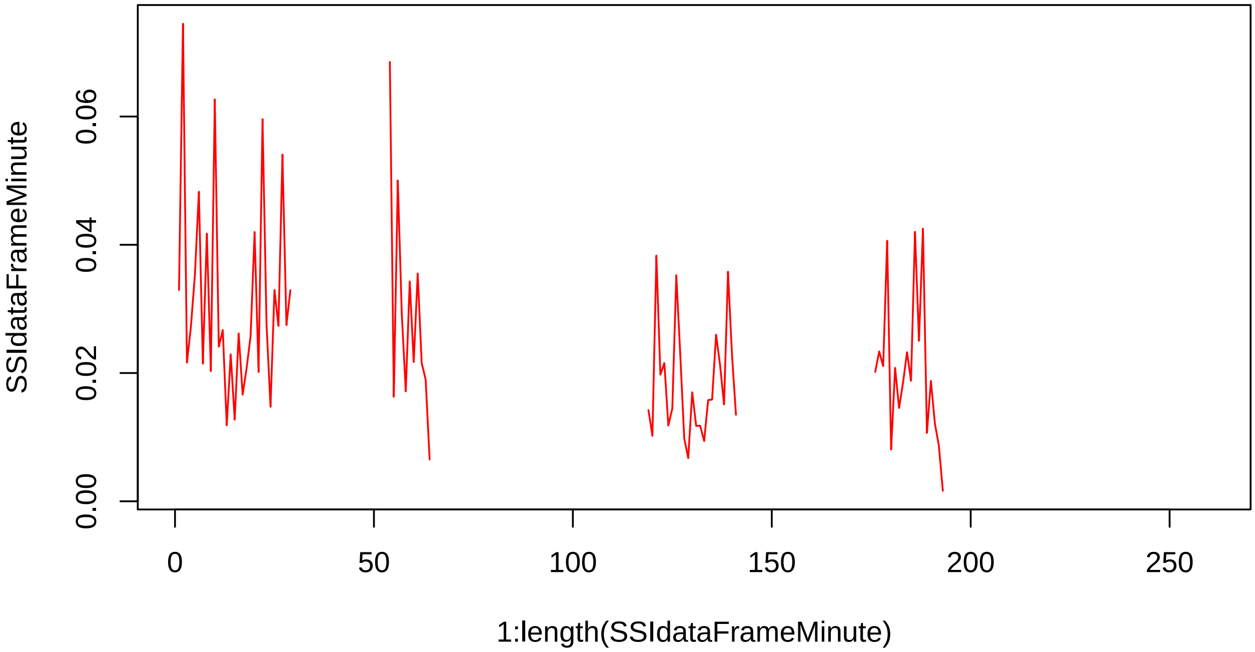


Evolution of synchrony through time, mean by minute

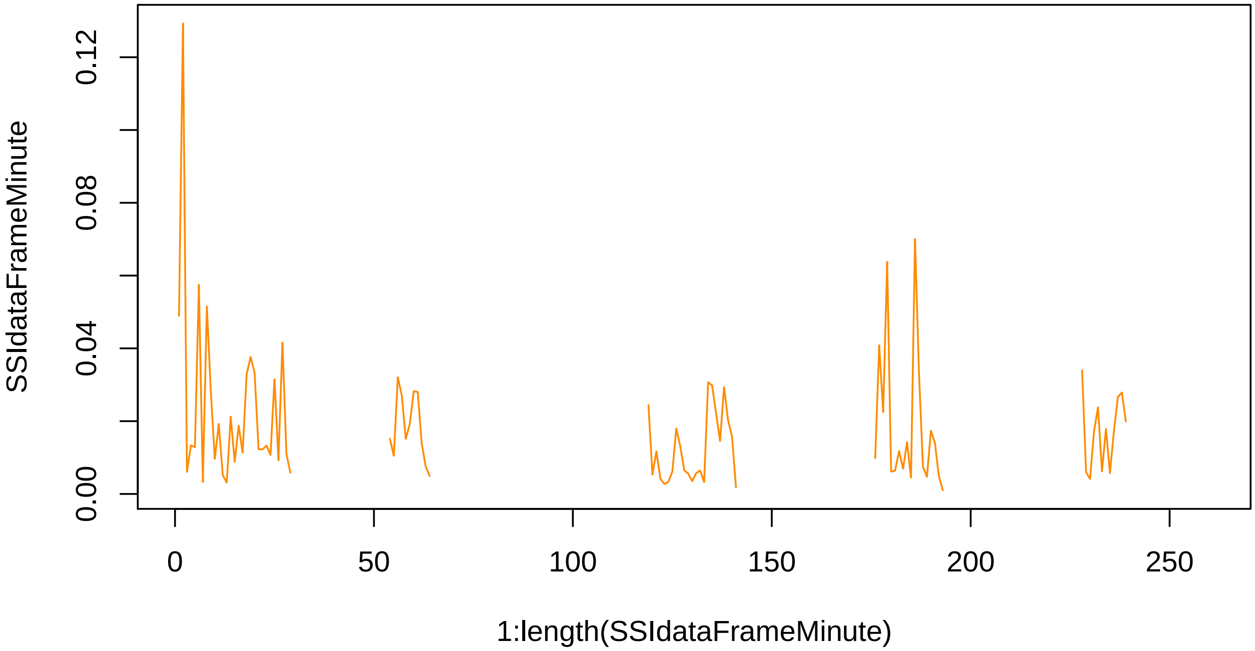
No log data

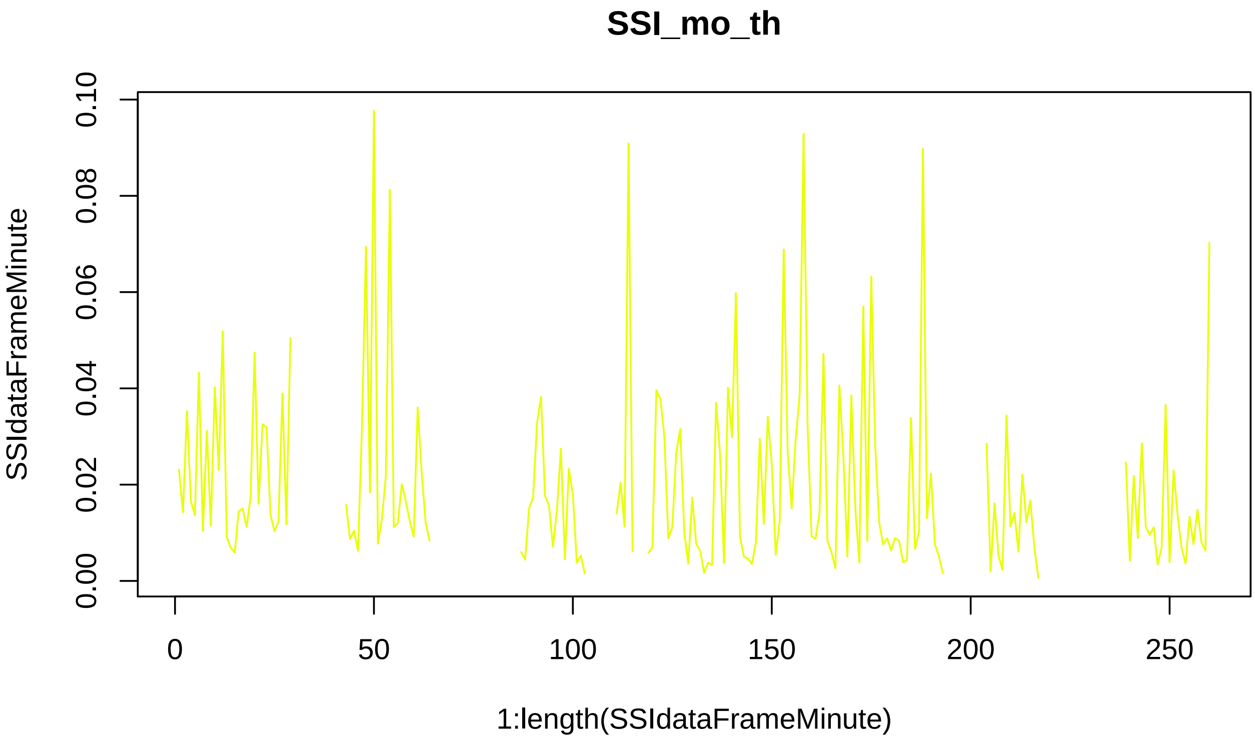
```
par(mar=c(4,4,4,4))
    col = 1
for (indexSSI in 6:length(SSIdataFrame)){
    IntervalNumbersVideo <- ceiling(length(SSIdataFrame[,indexSSI])/6)
    SSIColumn <- SSIdataFrame[,indexSSI]
    SSIdataFrameMinute <- c()
    for (i in 1:IntervalNumbersVideo){
          borneInf <- 1+(i-1)*6
          borneSup <- i * 6
          SSIVectorInterval <- SSIColumn[borneInf:borneSup]
          mean <- mean(SSIVectorInterval, na.rm=TRUE)
          SSIdataFrameMinute <- c(SSIdataFrameMinute, mean)}
    plot(1:length(SSIdataFrameMinute), SSIdataFrameMinute, type="l", col=rainbow(11)[col], main = names
    col <- col+1}
```

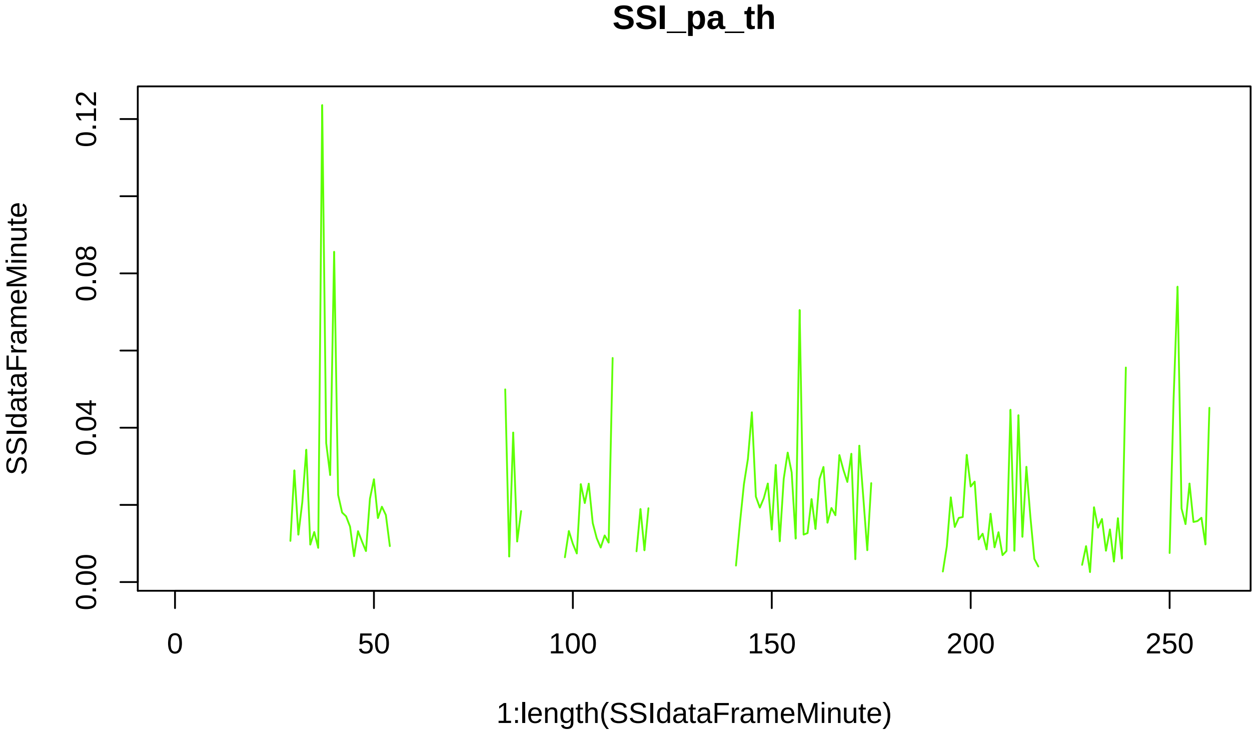
SSI_fa_mo_th

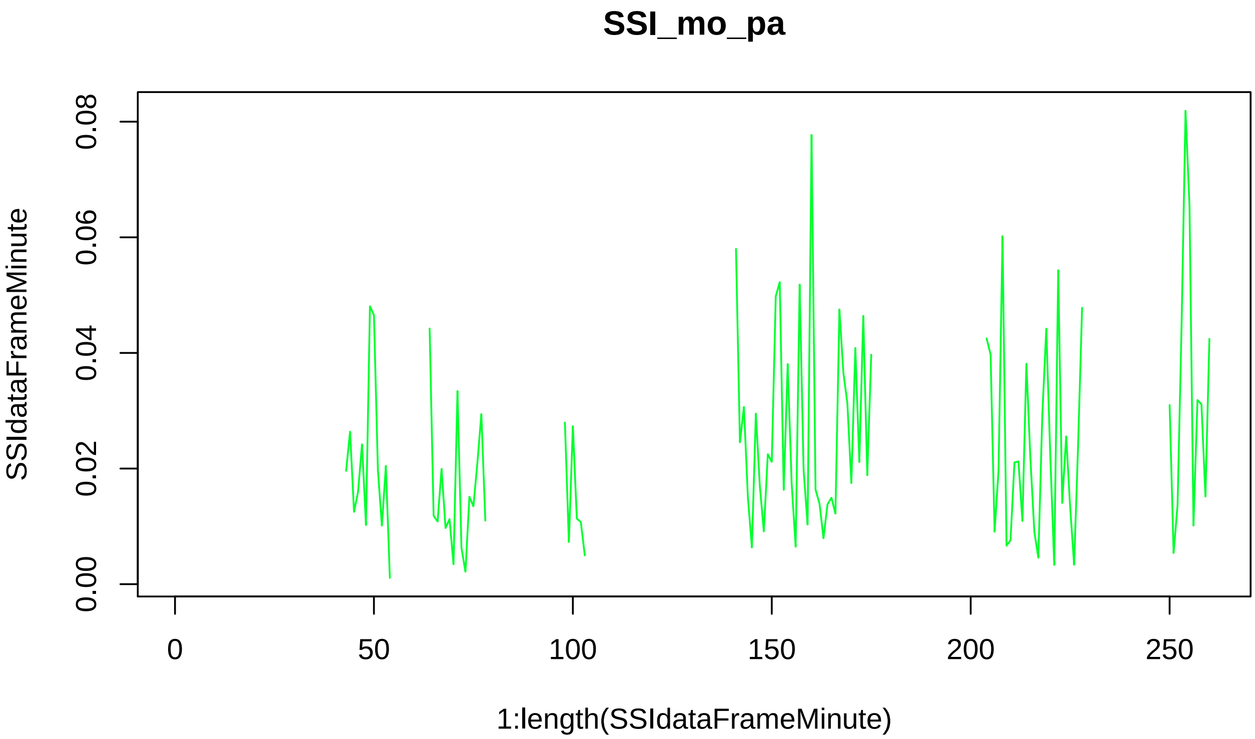


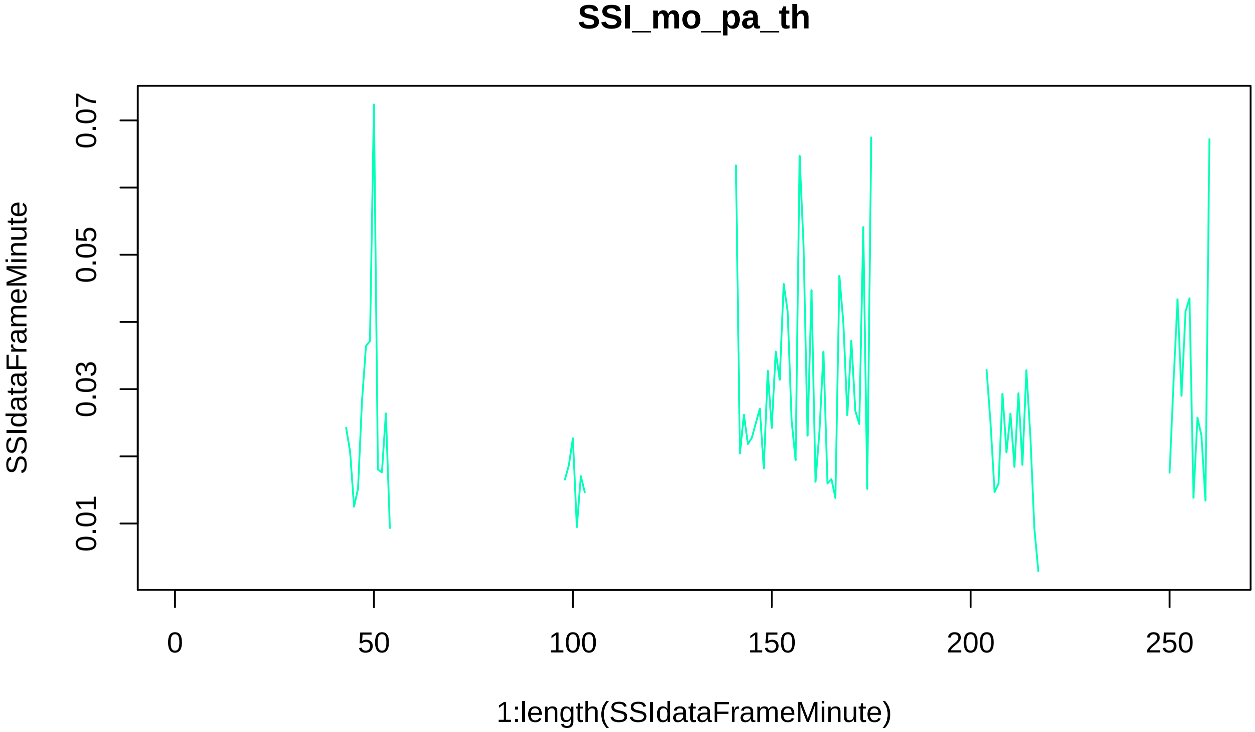
SSI_fa_th

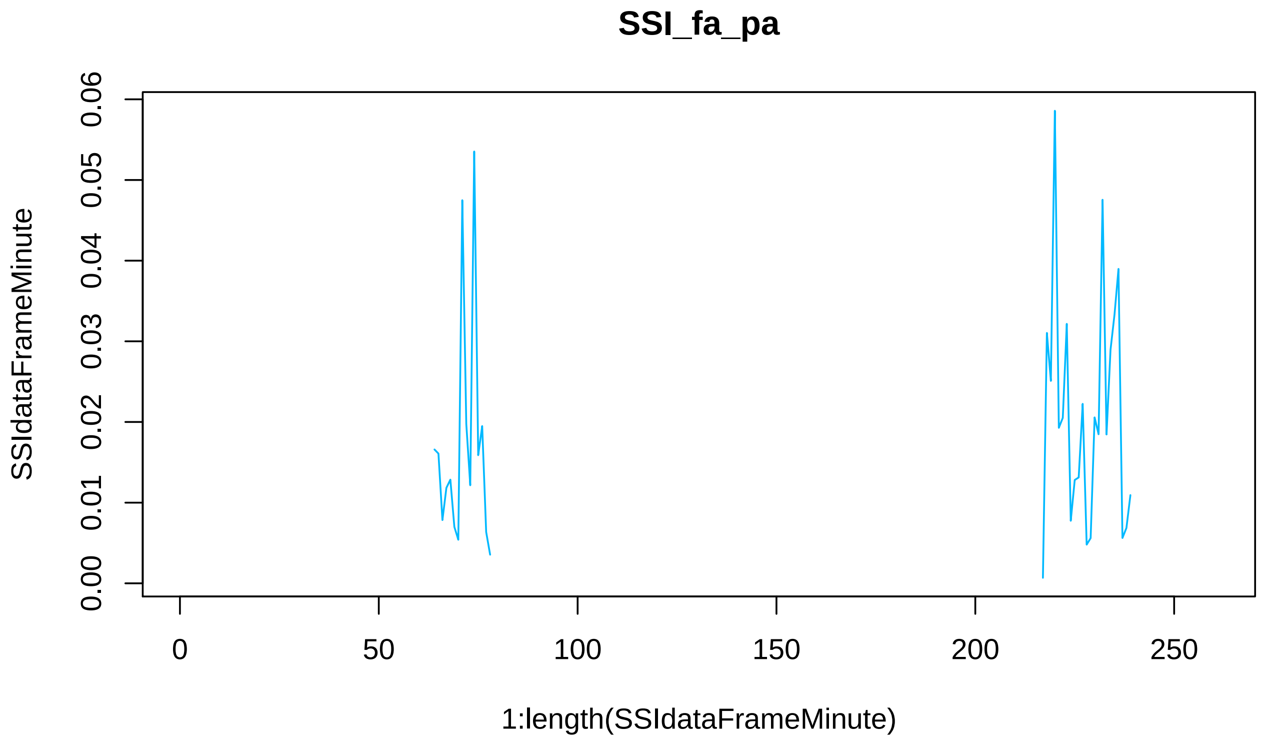


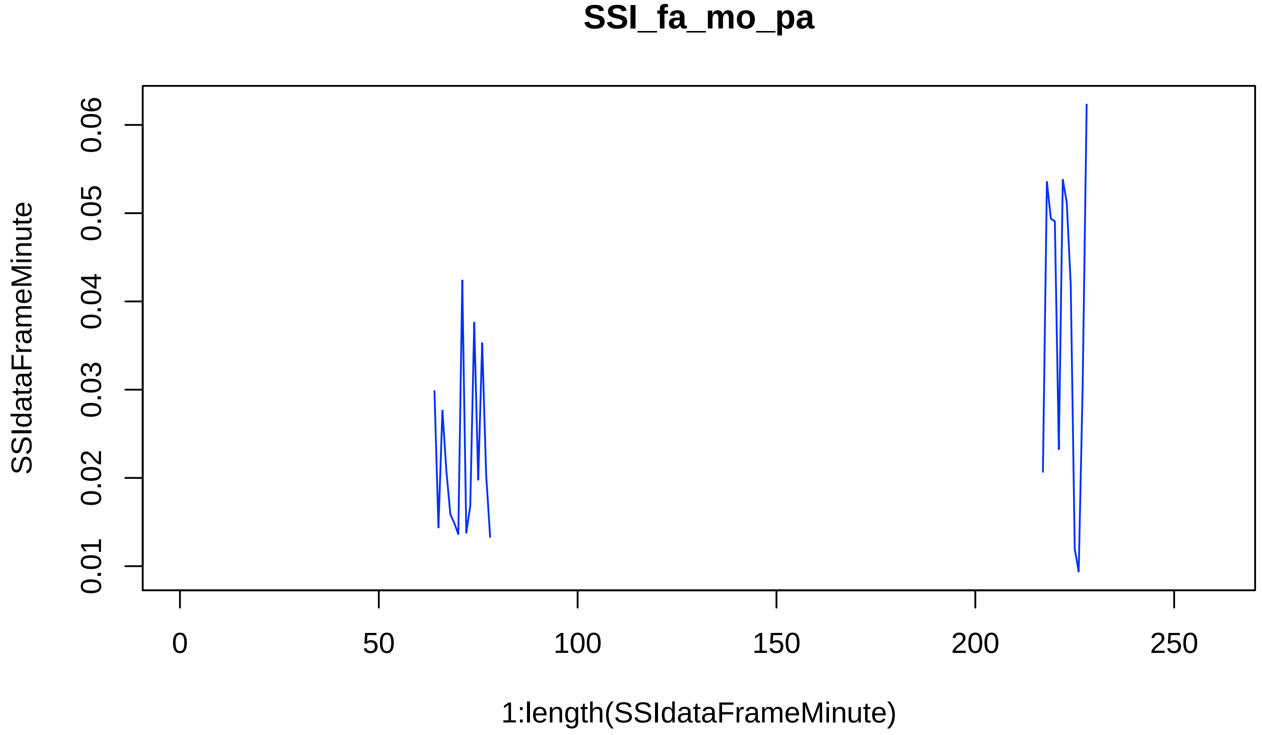

SSI_mo_th
SSIdataFrameMinute
0.00
0.02
0.04
0.06
0.08
0.10
0
50
100
150
200
250
1:length(SSIdataFrameMinute)

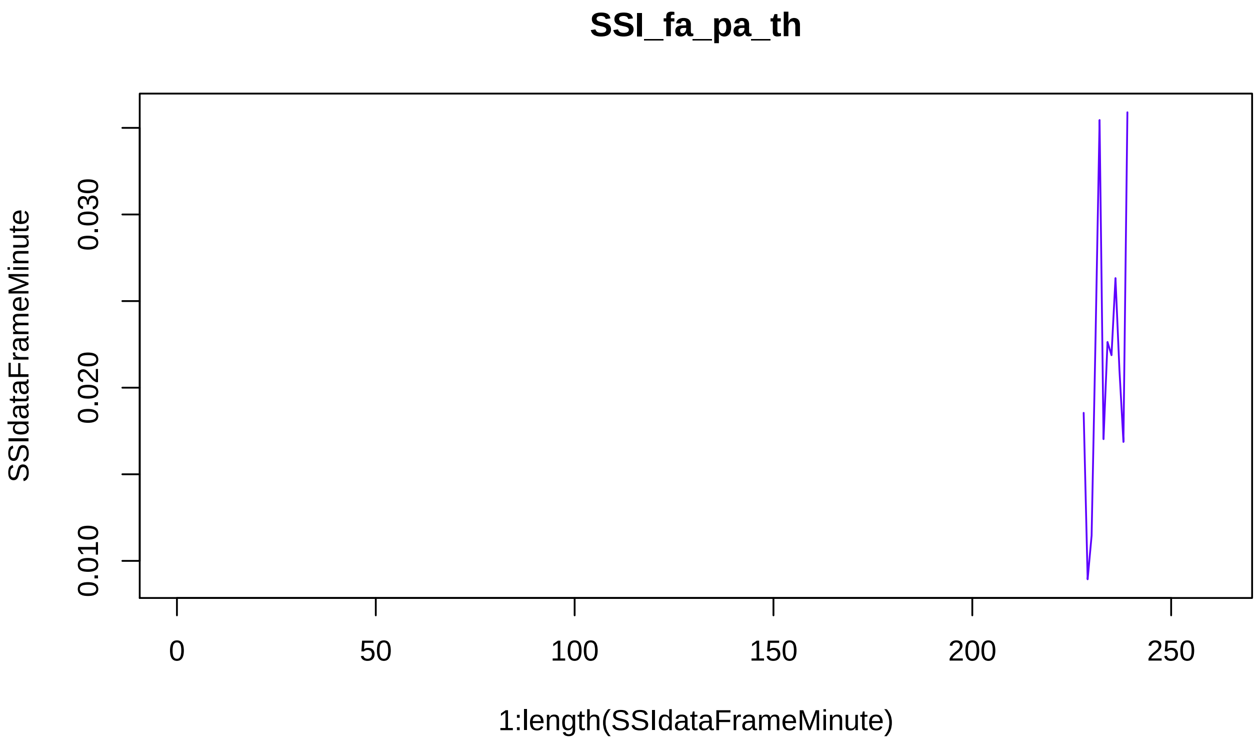

SSI_pa_th
SSIdataFrameMinute
0.00
0.04
0.08
0.12
0
50
100
150
200
250
1:length(SSIdataFrameMinute)


SSI_mo_pa
SSIdataFrameMinute
0.00
0.02
0.04
0.06
0.08
0
50
100
150
200
250
1:length(SSIdataFrameMinute)


SSI_mo_pa_th
SSIdataFrameMinute
0.01
0.03
0.05
0.07
0
50
100
150
200
250
1:length(SSIdataFrameMinute)

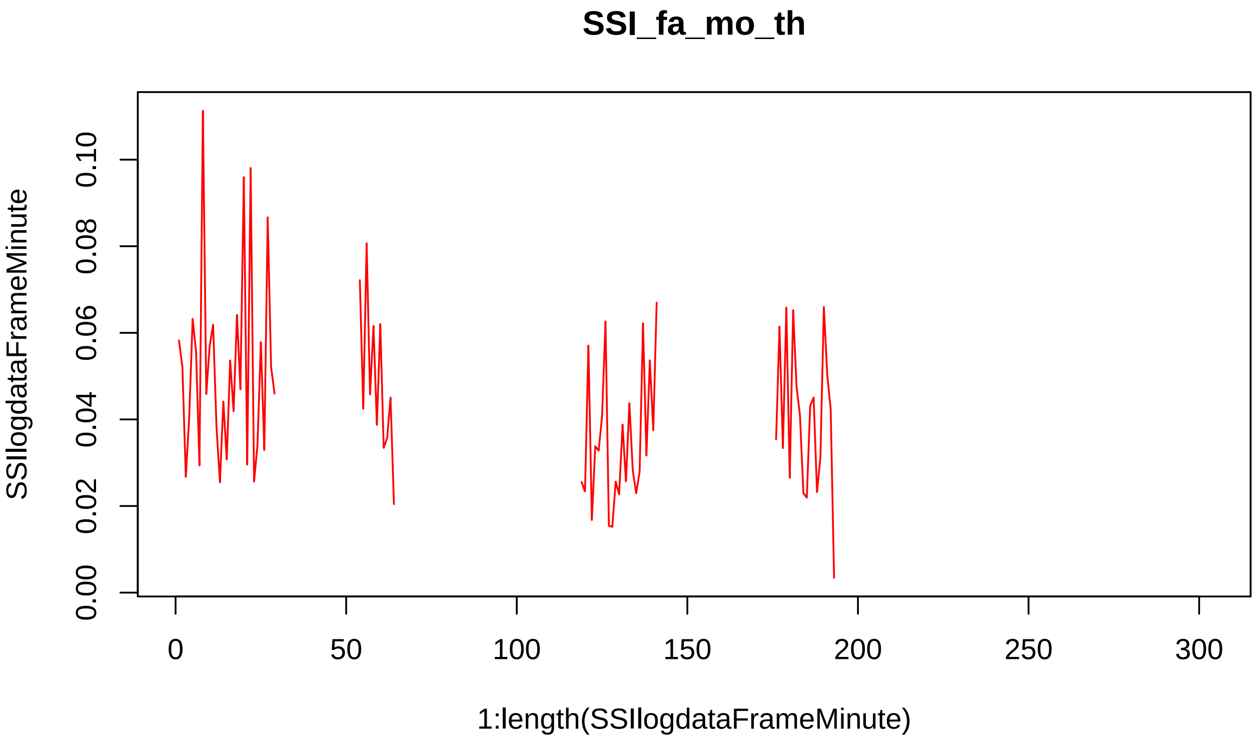

SSI_fa_pa
SSIdataFrameMinute
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0
50
100
150
200
250
1:length(SSIdataFrameMinute)


SSI_fa_mo_pa
SSIdataFrameMinute
0.01
0.02
0.03
0.04
0.05
0.06
0
50
100
150
200
250
1:length(SSIdataFrameMinute)

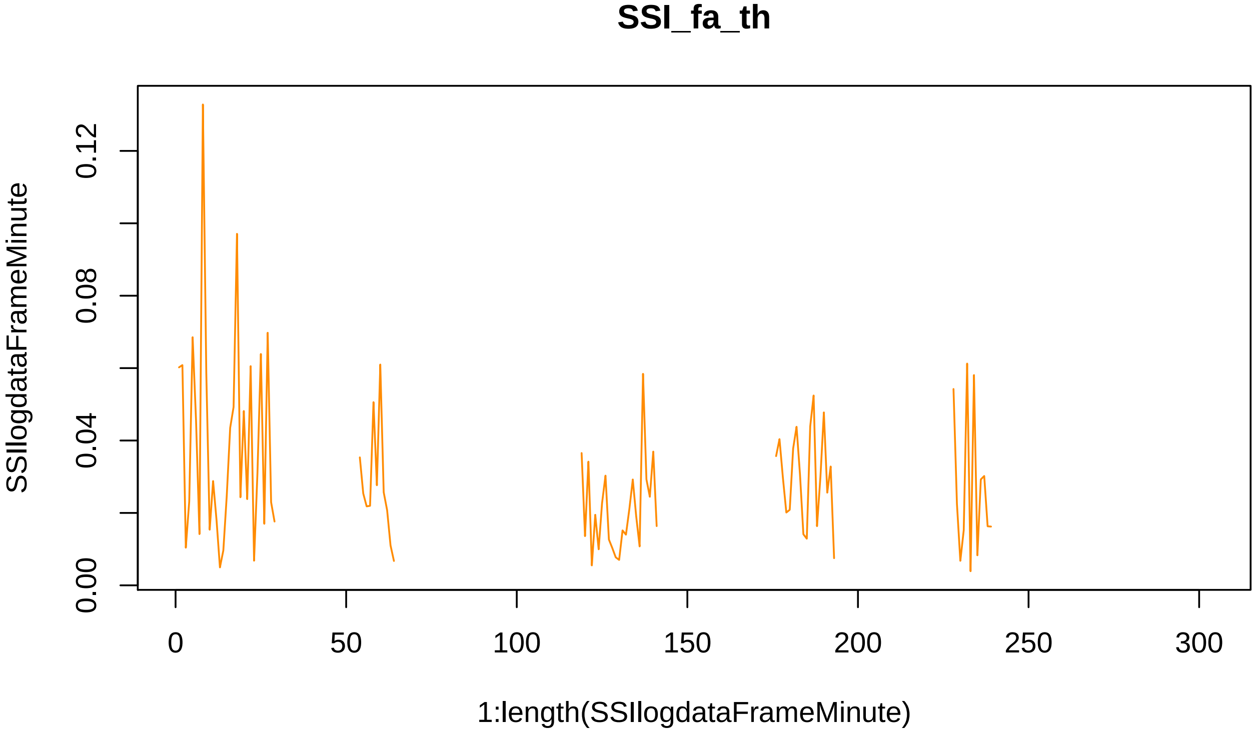


Log data

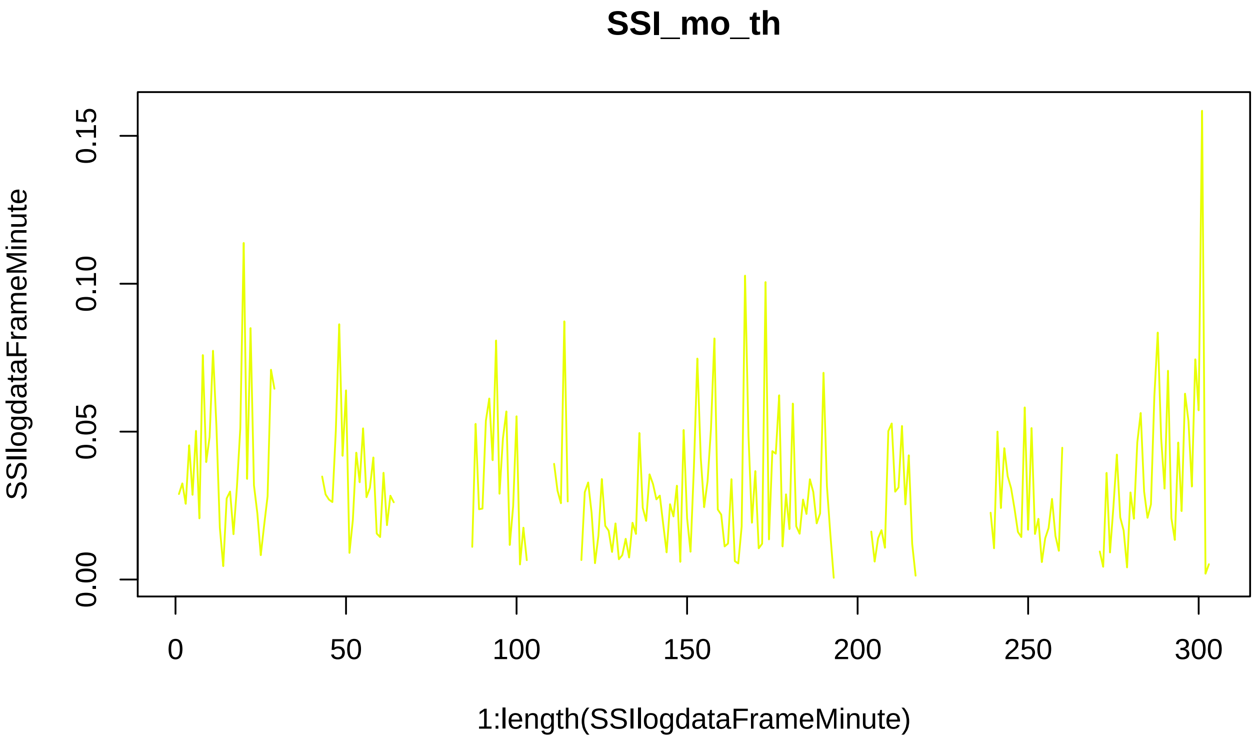
```
par(mar=c(4,4,4,4))
    col = 1
for (indexSSI in 6:length(SSIlogdataFrame)){
    IntervalNumbersVideo <- ceiling(length(SSIlogdataFrame[,indexSSI])/6)
    SSIlogColumn <- SSIlogdataFrame[,indexSSI]
    SSIlogdataFrameMinute <- c()
    for (i in 1:IntervalNumbersVideo){
          borneInf <- 1+(i-1)*6
          borneSup <- i * 6
          SSIlogVectorInterval <- SSIlogColumn[borneInf:borneSup]
          mean <- mean(SSIlogVectorInterval, na.rm=TRUE)
          SSIlogdataFrameMinute <- c(SSIlogdataFrameMinute, mean)}
    plot(1:length(SSIlogdataFrameMinute), SSIlogdataFrameMinute, type="l", col=rainbow(11)[col], main =
    col <- col+1}
```

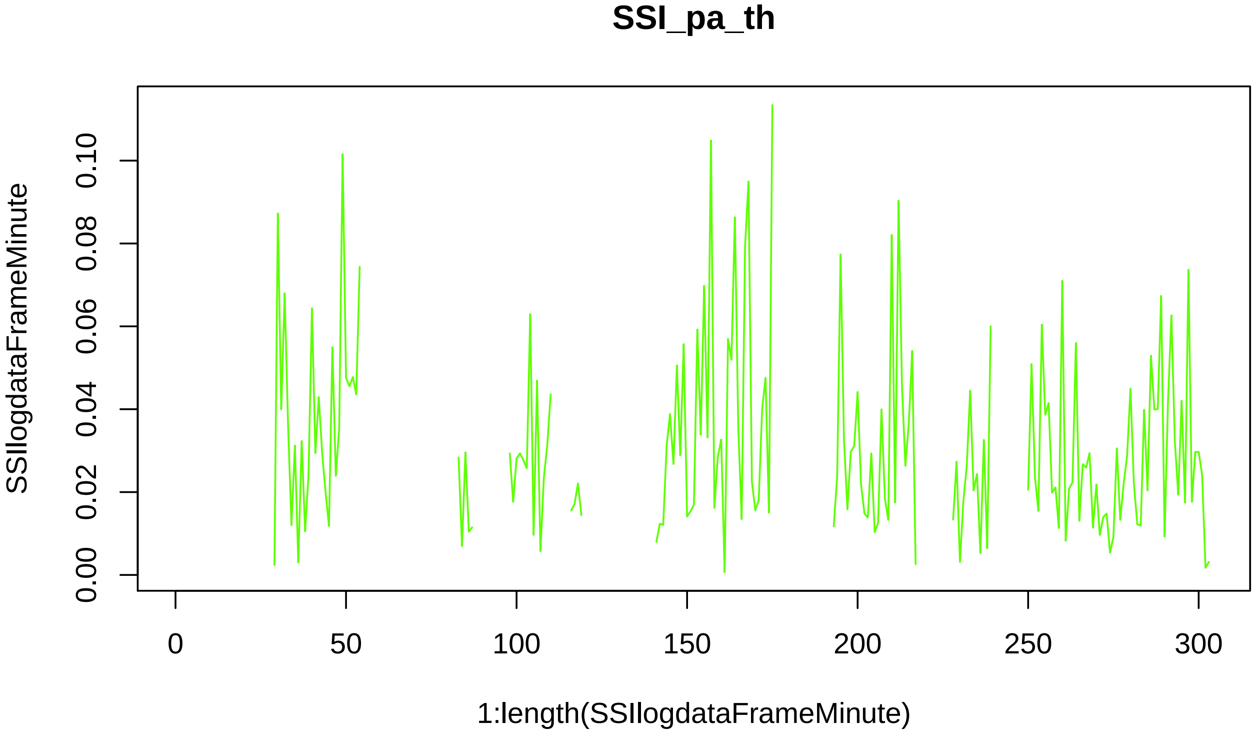


SSI_fa_mo_th

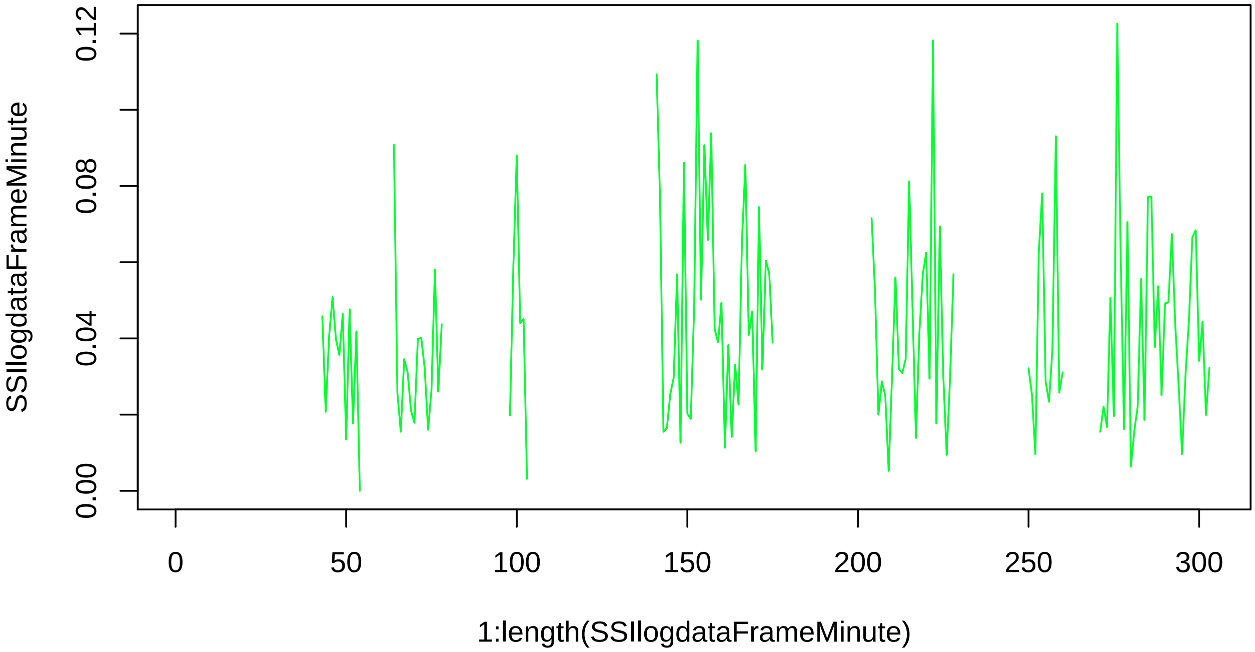


SSI_fa_th

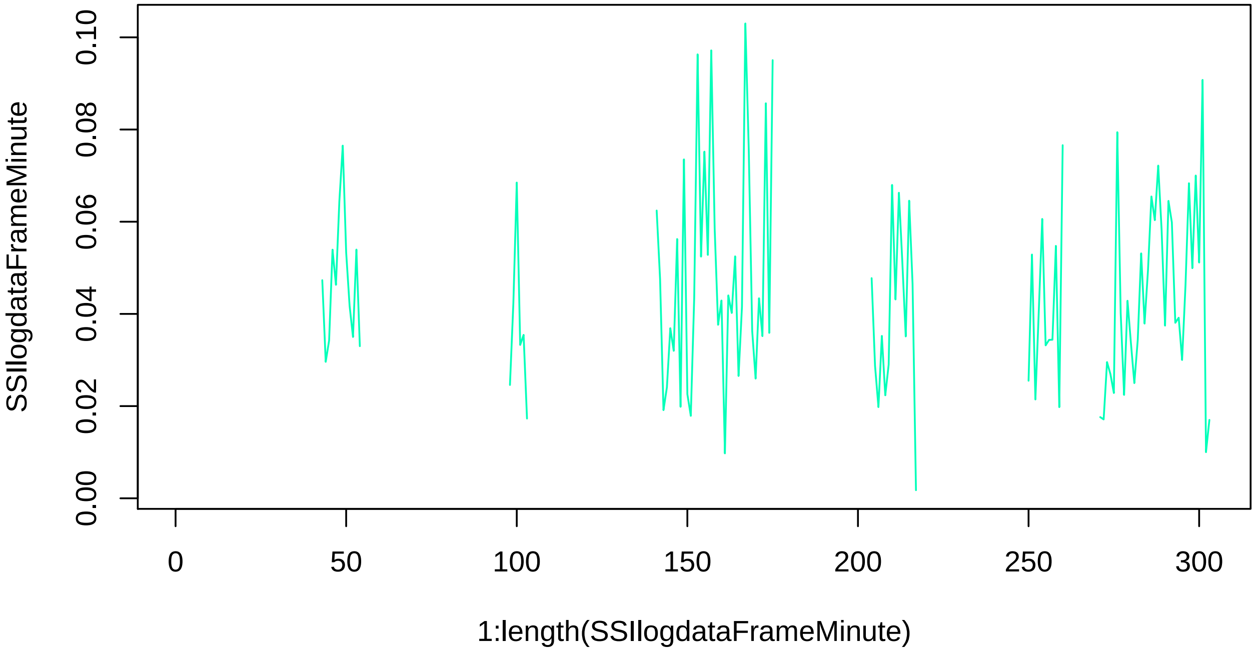

SSI_mo_th
SSIlogdataFrameMinute
0.00
0.05
0.10
0.15
0
50
100
150
200
250
300
1:length(SSIlogdataFrameMinute)

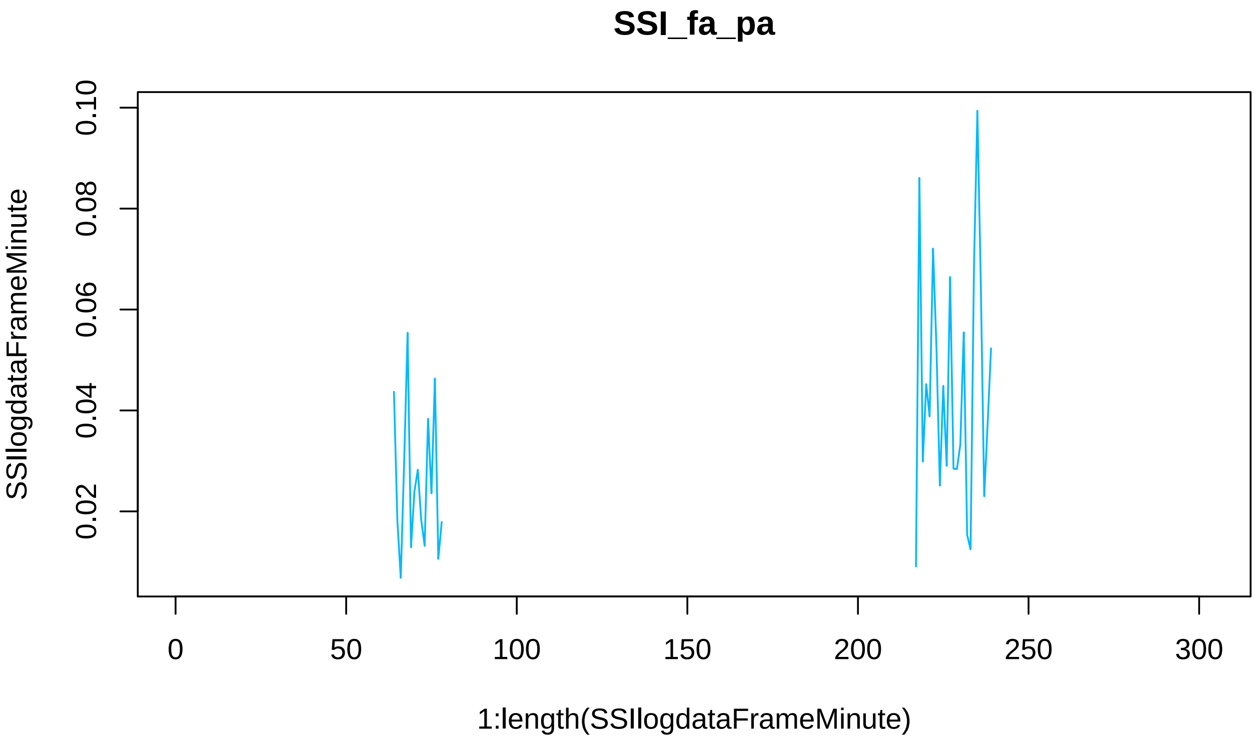

SSI_pa_th
SSIlogdataFrameMinute
0.00
0.02
0.04
0.06
0.08
0.10
0
50
100
150
200
250
300
1:length(SSIlogdataFrameMinute)

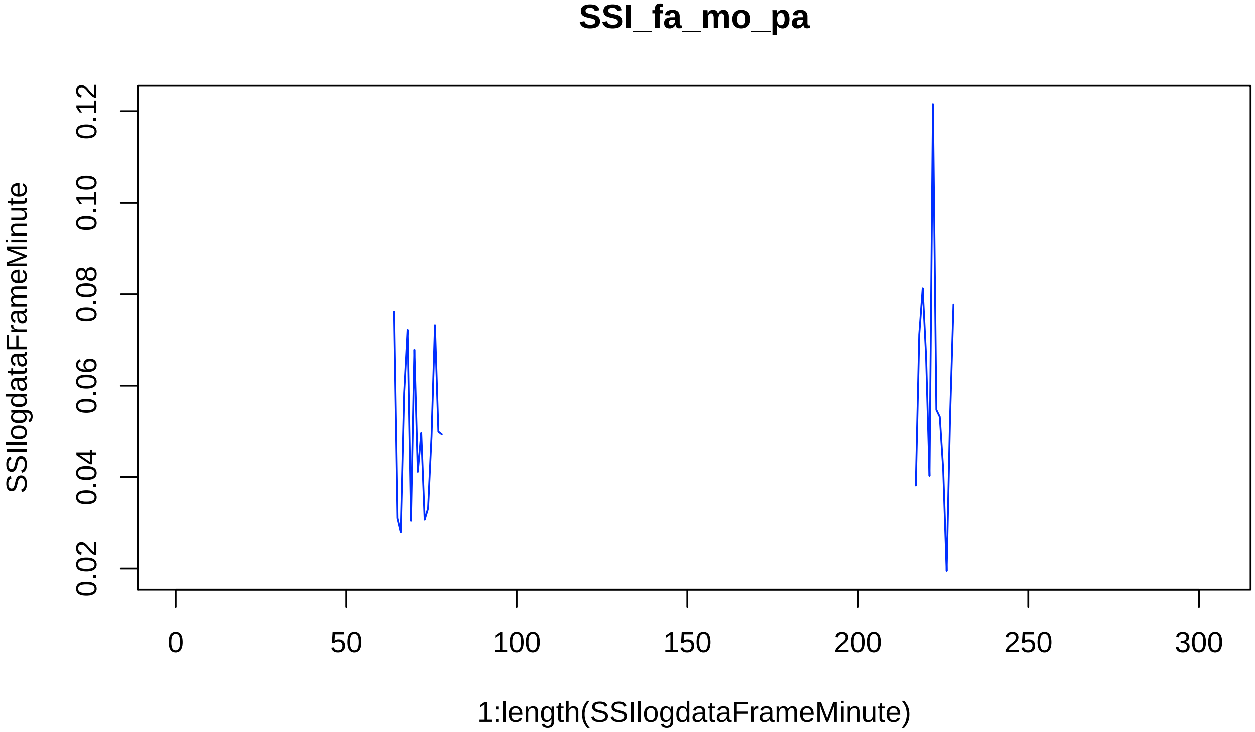
SSI_mo_pa

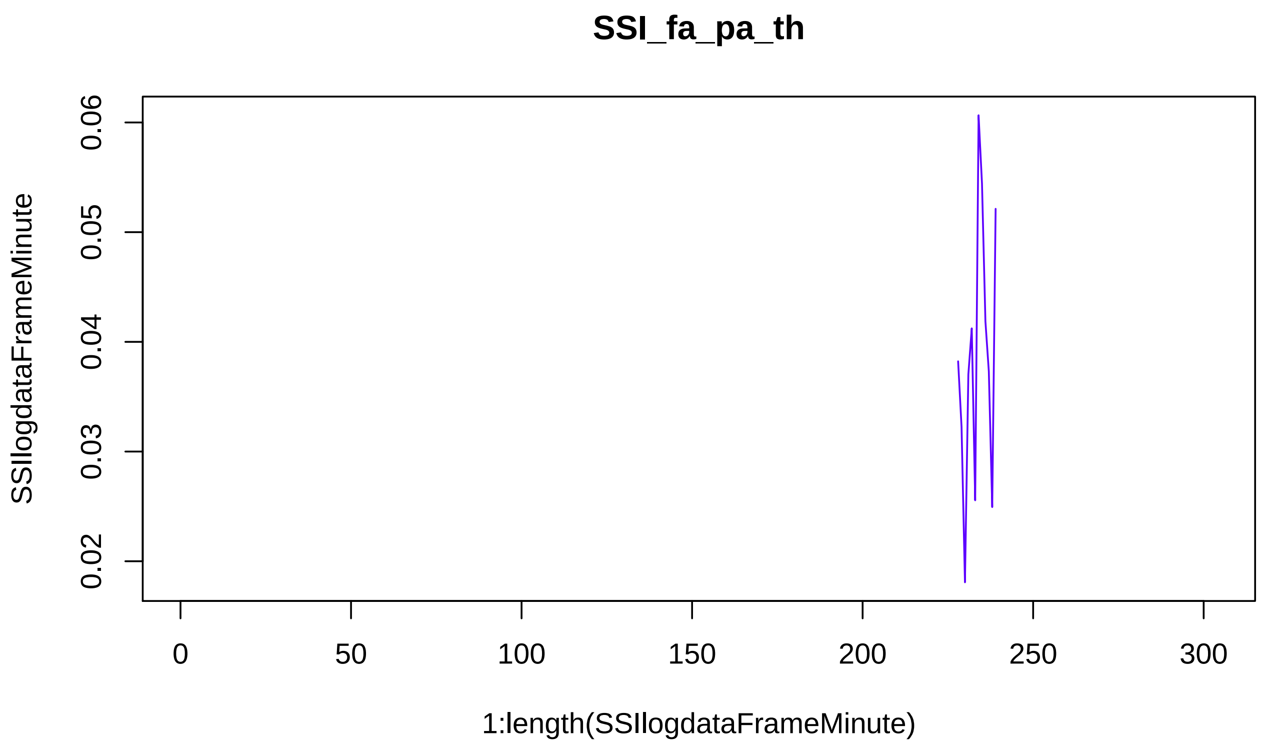


SSI_mo_pa_th




SSI_fa_pa
SSIlogdataFrameMinute
0.02
0.04
0.06
0.08
0.10
0
50
100
150
200
250
300
1:length(SSIlogdataFrameMinute)


SSI_fa_mo_pa
SSIlogdataFrameMinute
0.02
0.04
0.06
0.08
0.10
0.12
0
50
100
150
200
250
300
1:length(SSIlogdataFrameMinute)



Evolution of synchrony through time, mean by 10 minutes

```
par(mar=c(4,4,4,4))
    col = 1
for (indexSSI in 6:length(SSIdataFrame)){
    IntervalNumbersVideo <- ceiling(length(SSIdataFrame[,indexSSI])/60)
    SSIColumn <- SSIdataFrame[,indexSSI]
    SSIdataFrameTenMinute <- c()
    for (i in 1:IntervalNumbersVideo){
          borneInf <- 1+(i-1)*60
          borneSup <- i * 60
          SSIVectorInterval <- SSIColumn[borneInf:borneSup]
          mean <- mean(SSIVectorInterval, na.rm=TRUE)
          SSIdataFrameTenMinute <- c(SSIdataFrameTenMinute, mean)}
    plot(1:length(SSIdataFrameTenMinute), SSIdataFrameTenMinute, type="l", col=rainbow(11)[col], main =
    col <- col+1}
```

Models of synchrony

```
SSI_fa_th_lme <- lmer(SSI_fa_th ~ Time_min + (1|video), data=SSIdataFrame)
summary(SSI_fa_th_lme)
#plot(SSI_fa_th_lme)
res <- residuals(SSI_fa_th_lme)
hist(SSIdataFrame$SSI_fa_th)
qqnorm(res)
SSI_fa_th_List <- c()
for (i in indexList){
  SSI_fa_th_List <- c(SSI_fa_th_List, mean(SSIdataFrame[which(SSIdataFrame$video==i),]$SSI_fa_th, na.rm
}
print(SSI_fa_th_List)
#plot(SSI_fa_th_List, type="b")
```

```
# log of the data
log_SSI_fa_th <- hist(log(SSIdataFrame$SSI_fa_th))
SSI_fa_th_log_lme <- lmer(log(SSI_fa_th) ~ Time_min + (1|video), data=SSIdataFrame)
res_log <- residuals(SSI_fa_th_log_lme)
qqnorm(res_log)
summary(SSI_fa_th_log_lme)
```

```
# root square of the data
sq_SSI_fa_th <- hist(sqrt(SSIdataFrame$SSI_fa_th))
SSI_fa_th_sq_lme <- lmer(sqrt(SSI_fa_th) ~ Time_min + (1|video), data=SSIdataFrame)
res_sq <- residuals(SSI_fa_th_sq_lme)
qqnorm(res_sq)
summary(SSI_fa_th_sq_lme)
```