The Life of Eli

Matthew Malishev[1]*
[1] *Department of Biology, Emory University, 1510 Clifton Road NE, Atlanta, GA, USA, 30322*

Contents

Overview . . . 2
Install dependencies . . . 2
Set plotting function . . . 2
Load and clean data . . . 3
Subset activities . . . 4
Subset traits . . . 5
Growth . . . 8
Head . . . 8
Weight . . . 8
Height . . . 9
Feeding . . . 10
Left breast . . . 10
Right breast . . . 10
Diaper . . . 10
Pee . . . 11
Poo . . . 11
Both . . . 11
Leisure . . . 11
Bath . . . 11
Tummy . . . 11
Outdoors . . . 11
Play . . . 11
Sleep . . . 12
Lab . . . 12

Date: 2018-08-21
R version: 3.5.0
*Corresponding author: matthew.malishev@gmail.com
This document can be found at https://github.com/darwinanddavis/Eli

Overview

Activity data for Eli for his first year, including time spent feeding, sleeping, in leisure and values for growth and other behavioural traits.

TO DO

* ~~separate activity states~~
* separate hour and mins, then convert time to hours

Install dependencies

```
packages <- c("stringi","tidyr","sp","RColorBrewer","ggplot2","ggthemes")
if (require(packages)) {
    install.packages(packages,dependencies = T)
    require(packages)
}
lapply(packages,library,character.only=T)
```

Set plotting function

```
# plotting function (plot for MS or not, set bg color, set color palette from RColorBrewer, set alpha v
plot_it <- function(manuscript,bg,cp,alpha,family){
  graphics.off()
  if(manuscript==0){
    if(bg=="black"){
      colvec<-magma(200,1)
      par(bg = colvec[1],col.axis="white",col.lab="white",col.main="white",
          fg="white",bty="n",las=1,mar=c(5,6,4,2),family=family) #mono
      border=adjustcolor("purple",alpha=0.5)
    }else{
      colvec<-bpy.colors(200)
      par(bg = colvec[1],col.axis="white",col.lab="white",col.main="white",
          fg="white",bty="n",las=1,mar=c(5,6,4,2),family=family)
      border=adjustcolor("blue",alpha=0.5)
    }
  }else{
#    graphics.off()
    par(bty="n",las=1,family=family)
  }
  # color palettes
  # ifelse(manuscript==1,colvec<-adjustcolor(brewer.pal(9,cp)[9], alpha = alpha),colvec <- adjustcolor(
   # colfunc <<- colorRampPalette(brewer.pal(9,cp),alpha=alpha)
  colfunc <<- adjustcolor(brewer.pal(9,cp),alpha=alpha) # USES <<- OPERATOR
}
```

```
# Setting ggplot theme graphics
plot_it_gg <- function(bg){ # bg = colour to plot bg, family = font family
  if(bg=="white"){
    bg <- "white"
    fg <- "black"
  theme_tufte(base_family = "HersheySans") +
```

```
    theme(panel.border = element_blank(),panel.grid.major = element_blank(),panel.grid.minor = element_
    theme(axis.line = element_line(color = fg)) +theme(axis.ticks = element_line(color = fg)) + theme(pl
}
  }# end gg

# define colours
col1 <- "light blue"
col2 <- "orange"

# Set global plotting parameters
print("1/0, set colour, set colour palette 'display.brewer.all()',set alpha for col,set font")
plot_it(0,"blue","YlOrRd",1,"HersheySans") # set col function params
plot_it_gg("white") # same as above
```

Load and clean data

```
setwd(params$dir) # set wd
list.files()
```

```
 [1] "april.csv"       "eli_cache"       "eli_files"       "eli_weight.mp4"  "eli.docx"
 [6] "eli.html"        "eli.md"          "eli.pdf"         "eli.R"           "eli.Rmd"
[11] "Eli.Rproj"       "eli.tex"         "feb.csv"         "junejulyaug.csv" "march.csv"
[16] "may.csv"         "Notes.csv"
```

```
d <- "may" # choose month or total period

data <- read.csv(paste0(d,".csv"),header=T,sep=",", stringsAsFactors=FALSE)
colnames(data) <- c("Activity","Trait","Start","Finish","Value")
data[c("Activity", "Trait")] <- sapply(data[c("Activity", "Trait")],as.character)
head(data)
```

```
# A tibble: 6 x 5
  Activity Trait        Start                 Finish                Value
* <chr>    <chr>        <chr>                 <chr>                 <chr>
1 Growth   Head         16-Feb.-2018 8:06 pm  16-Feb.-2018 8:06 pm  35cm
2 Growth   Height       16-Feb.-2018 8:06 pm  16-Feb.-2018 8:06 pm  53cm
3 Growth   Weight       16-Feb.-2018 11:59 pm 16-Feb.-2018 11:59 pm 3.61kg
4 Feeding  Right Breast 18-Feb.-2018 1:25 am  18-Feb.-2018 1:35 am  ""
5 Feeding  Left Breast  18-Feb.-2018 1:35 am  18-Feb.-2018 1:44 am  ""
6 Feeding  Right Breast 18-Feb.-2018 3:24 am  18-Feb.-2018 3:45 am  ""
```

```
# load june july aug + data
# skip first three redundant rows
dd <- "junejulyaug"
data2 <- read.csv(paste0(dd,".csv"),header=T,sep=",", stringsAsFactors=FALSE,skip=3)
colnames(data2) <- c("Activity","Trait","Start","Finish","Value")
data2[c("Activity", "Trait")] <- sapply(data2[c("Activity", "Trait")],as.character)
str(data2)
```

```
'data.frame':   1330 obs. of  5 variables:
 $ Activity: chr  "Health" "Sleep" "Feeding" "Diapering" ...
 $ Trait   : chr  "Vaccination" "" "Right Breast" "Pee" ...
 $ Start   : chr  "19-Jun.-2018 10:10 am" "27-Jun.-2018 12:05 am" "27-Jun.-2018 9:31 am" "27-Jun.-2018 9
 $ Finish  : chr  "19-Jun.-2018 10:10 am" "27-Jun.-2018 9:32 am" "27-Jun.-2018 9:40 am" "27-Jun.-2018 9
```

```
 $ Value    : chr  "4mnth immunizations" "" "" "" ...
```

```
# add june july aug + data to existing data frame
data <- rbind(data,data2)
```

Subset activities

```
unique(data$Activity)
```

```
[1] "Growth"    "Feeding"   "Sleep"     "Diapering" "Health"    "Leisure"   "Pumping"
```

```
grow <- subset(data,subset=Activity=="Growth");head(grow)
```

```
# A tibble: 6 x 5
  Activity Trait  Start                 Finish                Value
* <chr>    <chr>  <chr>                 <chr>                 <chr>
1 Growth   Head   16-Feb.-2018 8:06 pm  16-Feb.-2018 8:06 pm  35cm
2 Growth   Height 16-Feb.-2018 8:06 pm  16-Feb.-2018 8:06 pm  53cm
3 Growth   Weight 16-Feb.-2018 11:59 pm 16-Feb.-2018 11:59 pm 3.61kg
4 Growth   Weight 27-Feb.-2018 12:00 pm 27-Feb.-2018 12:00 pm 3.67kg
5 Growth   Weight 07-Mar.-2018 1:08 pm  07-Mar.-2018 1:08 pm  4.01kg
6 Growth   Height 07-Mar.-2018 1:08 pm  07-Mar.-2018 1:08 pm  55cm
```

```
feed <- subset(data,subset=Activity=="Feeding");head(feed)
```

```
# A tibble: 6 x 5
  Activity Trait        Start                 Finish                Value
* <chr>    <chr>        <chr>                 <chr>                 <chr>
1 Feeding  Right Breast 18-Feb.-2018 1:25 am  18-Feb.-2018 1:35 am  ""
2 Feeding  Left Breast  18-Feb.-2018 1:35 am  18-Feb.-2018 1:44 am  ""
3 Feeding  Right Breast 18-Feb.-2018 3:24 am  18-Feb.-2018 3:45 am  ""
4 Feeding  Left Breast  18-Feb.-2018 7:39 am  18-Feb.-2018 8:05 am  ""
5 Feeding  Right Breast 18-Feb.-2018 10:12 am 18-Feb.-2018 10:45 am ""
6 Feeding  Left Breast  18-Feb.-2018 10:48 am 18-Feb.-2018 11:35 am ""
```

```
sleep <- subset(data,subset=Activity=="Sleep");head(sleep)
```

```
# A tibble: 6 x 5
  Activity Trait Start                 Finish                Value
* <chr>    <chr> <chr>                 <chr>                 <chr>
1 Sleep    ""    18-Feb.-2018 8:53 am  18-Feb.-2018 9:41 am  ""
2 Sleep    ""    18-Feb.-2018 11:32 am 18-Feb.-2018 3:16 pm  ""
3 Sleep    ""    18-Feb.-2018 10:24 pm 18-Feb.-2018 10:52 pm ""
4 Sleep    ""    19-Feb.-2018 1:40 am  19-Feb.-2018 3:00 am  ""
5 Sleep    ""    19-Feb.-2018 3:36 am  19-Feb.-2018 3:38 am  ""
6 Sleep    ""    19-Feb.-2018 5:15 pm  19-Feb.-2018 6:05 pm  ""
```

```
diaper <- subset(data,subset=Activity=="Diapering");head(diaper)
```

```
# A tibble: 6 x 5
  Activity  Trait     Start                 Finish                Value
* <chr>     <chr>     <chr>                 <chr>                 <chr>
1 Diapering Pee & Poo 18-Feb.-2018 10:01 am 18-Feb.-2018 10:01 am olive
2 Diapering Poo       18-Feb.-2018 6:42 pm  18-Feb.-2018 6:42 pm  licorice, shiny
3 Diapering Poo       18-Feb.-2018 10:00 pm 18-Feb.-2018 10:00 pm small like earlier, olive green
4 Diapering Pee       20-Feb.-2018 2:46 am  20-Feb.-2018 2:46 am  ""
```

```
5 Diapering Poo       20-Feb.-2018 2:47 am  20-Feb.-2018 2:47 am  Fresh. Olive/brown
6 Diapering Pee & Poo 20-Feb.-2018 3:54 am  20-Feb.-2018 3:54 am  ""
```

```
leisure <- subset(data,subset=Activity=="Leisure");head(leisure)
```

```
# A tibble: 6 x 5
  Activity Trait      Start                 Finish                Value
* <chr>    <chr>      <chr>                 <chr>                 <chr>
1 Leisure  Bath time  13-Mar.-2018 10:15 pm 13-Mar.-2018 10:30 pm ""
2 Leisure  Bath time  15-Mar.-2018 9:15 pm  15-Mar.-2018 9:30 pm  ""
3 Leisure  Tummy time 17-Mar.-2018 8:00 pm  17-Mar.-2018 8:02 pm  ""
4 Leisure  Bath time  17-Mar.-2018 9:10 pm  17-Mar.-2018 9:30 pm  ""
5 Leisure  Tummy time 18-Mar.-2018 6:40 pm  18-Mar.-2018 6:45 pm  ""
6 Leisure  Tummy time 20-Mar.-2018 12:09 am 20-Mar.-2018 12:14 am ""
```

Subset traits

```
# activity states with traits: grow,feed,diaper,leisure

# grow
grow <- within(grow, rm("Finish")) # only time stamp, so remove Finish time col
head <- subset(grow,subset=Trait=="Head");head
```

```
# A tibble: 3 x 4
  Activity Trait Start                 Value
* <chr>    <chr> <chr>                 <chr>
1 Growth   Head  16-Feb.-2018 8:06 pm  35cm
2 Growth   Head  07-Mar.-2018 1:08 pm  37.5cm
3 Growth   Head  24-Apr.-2018 10:16 pm 40cm
```

```
height <- subset(grow,subset=Trait=="Height");height
```

```
# A tibble: 4 x 4
  Activity Trait  Start                 Value
* <chr>    <chr>  <chr>                 <chr>
1 Growth   Height 16-Feb.-2018 8:06 pm  53cm
2 Growth   Height 07-Mar.-2018 1:08 pm  55cm
3 Growth   Height 24-Apr.-2018 10:15 pm 61.5cm
4 Growth   Height 23/05/18 20:20        63cm
```

```
weight <- subset(grow,subset=Trait=="Weight");weight
```

```
# A tibble: 10 x 4
   Activity Trait  Start                 Value
 * <chr>    <chr>  <chr>                 <chr>
 1 Growth   Weight 16-Feb.-2018 11:59 pm 3.61kg
 2 Growth   Weight 27-Feb.-2018 12:00 pm 3.67kg
 3 Growth   Weight 07-Mar.-2018 1:08 pm  4.01kg
 4 Growth   Weight 21-Mar.-2018 10:45 am 4.695kg
 5 Growth   Weight 28-Mar.-2018 6:09 pm  5.1kg
 6 Growth   Weight 11-Apr.-2018 11:12 am 5.5kg
 7 Growth   Weight 16-Apr.-2018 2:28 pm  5.5kg, @ babybunting
 8 Growth   Weight 24-Apr.-2018 10:14 pm 5.73kg
 9 Growth   Weight 10/05/18 12:14        6kg
10 Growth   Weight 02-Jul.-2018 1:10 pm  6.6kg
```

```
# feed
feed <- within(feed,rm("Value")) # no values, so remove Values col
breast_l <- subset(feed,subset=Trait=="Left Breast");head(breast_l)
```

```
# A tibble: 6 x 4
  Activity Trait       Start                Finish
* <chr>    <chr>       <chr>                <chr>
1 Feeding  Left Breast 18-Feb.-2018 1:35 am  18-Feb.-2018 1:44 am
2 Feeding  Left Breast 18-Feb.-2018 7:39 am  18-Feb.-2018 8:05 am
3 Feeding  Left Breast 18-Feb.-2018 10:48 am 18-Feb.-2018 11:35 am
4 Feeding  Left Breast 18-Feb.-2018 4:17 pm  18-Feb.-2018 4:17 pm
5 Feeding  Left Breast 18-Feb.-2018 4:20 pm  18-Feb.-2018 4:20 pm
6 Feeding  Left Breast 18-Feb.-2018 5:32 pm  18-Feb.-2018 5:40 pm
```

```
breast_r <- subset(feed,subset=Trait=="Right Breast");head(breast_r)
```

```
# A tibble: 6 x 4
  Activity Trait        Start                Finish
* <chr>    <chr>        <chr>                <chr>
1 Feeding  Right Breast 18-Feb.-2018 1:25 am  18-Feb.-2018 1:35 am
2 Feeding  Right Breast 18-Feb.-2018 3:24 am  18-Feb.-2018 3:45 am
3 Feeding  Right Breast 18-Feb.-2018 10:12 am 18-Feb.-2018 10:45 am
4 Feeding  Right Breast 18-Feb.-2018 3:23 pm  18-Feb.-2018 3:56 pm
5 Feeding  Right Breast 18-Feb.-2018 6:40 pm  18-Feb.-2018 6:52 pm
6 Feeding  Right Breast 18-Feb.-2018 7:02 pm  18-Feb.-2018 7:30 pm
```

```
bottle <- subset(feed,subset=Trait=="Bottle");head(bottle)
```

```
# A tibble: 6 x 4
  Activity Trait  Start                Finish
* <chr>    <chr>  <chr>                <chr>
1 Feeding  Bottle 12-Mar.-2018 11:12 am 12-Mar.-2018 11:22 am
2 Feeding  Bottle 19-Apr.-2018 1:10 pm  19-Apr.-2018 1:12 pm
3 Feeding  Bottle 19-Apr.-2018 9:35 pm  19-Apr.-2018 9:42 pm
4 Feeding  Bottle 21/05/18 11:47        21/05/18 11:55
5 Feeding  Bottle 25/05/18 19:12        25/05/18 19:21
6 Feeding  Bottle 08-Aug.-2018 12:09 pm 08-Aug.-2018 12:09 pm
```

```
# diaper
diaper <- within(diaper, rm("Finish")) # only time stamp, so remove Finish time col
pee <- subset(diaper,subset=Trait=="Pee");head(pee)
```

```
# A tibble: 6 x 4
  Activity  Trait Start                Value
* <chr>     <chr> <chr>                <chr>
1 Diapering Pee   20-Feb.-2018 2:46 am  ""
2 Diapering Pee   20-Feb.-2018 11:20 am ""
3 Diapering Pee   20-Feb.-2018 4:29 pm  ""
4 Diapering Pee   20-Feb.-2018 7:09 pm  ""
5 Diapering Pee   20-Feb.-2018 8:30 pm  ""
6 Diapering Pee   21-Feb.-2018 2:29 am  ""
```

```
poo <- subset(diaper,subset=Trait=="Poo");head(poo)
```

```
# A tibble: 6 x 4
  Activity  Trait Start                Value
* <chr>     <chr> <chr>                <chr>
```

```
1 Diapering Poo   18-Feb.-2018 6:42 pm  licorice, shiny
2 Diapering Poo   18-Feb.-2018 10:00 pm small like earlier, olive green
3 Diapering Poo   20-Feb.-2018 2:47 am  Fresh. Olive/brown
4 Diapering Poo   20-Feb.-2018 4:31 pm  ""
5 Diapering Poo   21-Feb.-2018 12:45 am ""
6 Diapering Poo   21-Feb.-2018 1:51 pm  ""
```

```
both <- subset(diaper,subset=Trait==unique(diaper$Trait)[1]);head(both)
```

```
# A tibble: 6 x 4
  Activity  Trait     Start                 Value
* <chr>     <chr>     <chr>                 <chr>
1 Diapering Pee & Poo 18-Feb.-2018 10:01 am olive
2 Diapering Pee & Poo 20-Feb.-2018 3:54 am  ""
3 Diapering Pee & Poo 20-Feb.-2018 11:42 pm ""
4 Diapering Pee & Poo 21-Feb.-2018 4:53 am  ""
5 Diapering Pee & Poo 22-Feb.-2018 10:20 pm ""
6 Diapering Pee & Poo 23-Feb.-2018 4:55 am  ""
```

```
# leisure
leisure <- within(leisure, rm("Value")) # no values, so remove Values col
bath <- subset(leisure,subset=Trait=="Bath time");head(bath)
```

```
# A tibble: 6 x 4
  Activity Trait     Start                 Finish
* <chr>    <chr>     <chr>                 <chr>
1 Leisure  Bath time 13-Mar.-2018 10:15 pm 13-Mar.-2018 10:30 pm
2 Leisure  Bath time 15-Mar.-2018 9:15 pm  15-Mar.-2018 9:30 pm
3 Leisure  Bath time 17-Mar.-2018 9:10 pm  17-Mar.-2018 9:30 pm
4 Leisure  Bath time 22-Mar.-2018 11:05 pm 22-Mar.-2018 11:29 pm
5 Leisure  Bath time 24-Mar.-2018 9:10 pm  24-Mar.-2018 9:34 pm
6 Leisure  Bath time 27-Mar.-2018 9:10 pm  27-Mar.-2018 9:30 pm
```

```
tummy <- subset(leisure,subset=Trait=="Tummy time");head(tummy)
```

```
# A tibble: 6 x 4
  Activity Trait      Start                 Finish
* <chr>    <chr>      <chr>                 <chr>
1 Leisure  Tummy time 17-Mar.-2018 8:00 pm  17-Mar.-2018 8:02 pm
2 Leisure  Tummy time 18-Mar.-2018 6:40 pm  18-Mar.-2018 6:45 pm
3 Leisure  Tummy time 20-Mar.-2018 12:09 am 20-Mar.-2018 12:14 am
4 Leisure  Tummy time 21-Mar.-2018 10:52 pm 21-Mar.-2018 10:54 pm
5 Leisure  Tummy time 24-Mar.-2018 9:37 pm  24-Mar.-2018 9:40 pm
6 Leisure  Tummy time 27-Mar.-2018 1:53 pm  27-Mar.-2018 2:00 pm
```

```
outdoors <- subset(leisure,subset=Trait=="Outdoors");outdoors
```

```
# A tibble: 6 x 4
  Activity Trait    Start                Finish
* <chr>    <chr>    <chr>                <chr>
1 Leisure  Outdoors 5/05/18 15:37        5/05/18 16:11
2 Leisure  Outdoors 6/05/18 13:46        6/05/18 14:46
3 Leisure  Outdoors 8/05/18 15:10        8/05/18 16:16
4 Leisure  Outdoors 25/05/18 14:03       25/05/18 16:03
5 Leisure  Outdoors 06-Jul.-2018 2:00 pm 06-Jul.-2018 3:45 pm
6 Leisure  Outdoors 13-Jul.-2018 1:45 pm 13-Jul.-2018 3:33 pm
```

```
play <- subset(leisure,subset=Trait=="Play time");head(play)
```

```
# A tibble: 6 x 4
  Activity Trait     Start          Finish
* <chr>    <chr>     <chr>          <chr>
1 Leisure  Play time 7/05/18 10:35  7/05/18 11:16
2 Leisure  Play time 8/05/18 10:03  8/05/18 10:13
3 Leisure  Play time 9/05/18 22:25  9/05/18 22:35
4 Leisure  Play time 10/05/18 20:57 10/05/18 21:03
5 Leisure  Play time 15/05/18 12:41 15/05/18 13:11
6 Leisure  Play time 16/05/18 6:58  16/05/18 7:10
```

```
# sleep
sleep <- within(sleep,rm("Value")) # no values, so remove Values col
sleep <- within(sleep,rm("Trait")) # no Traits, so remove Traits col
```

Growth

No time period, just values

Head

```
require("stringi")
require("tidyr")
require("sp")
require("RColorBrewer")

plot_it(0,"blue","Blues",0.5,"HersheySans")
hv <- gsub("[^[:digit:]]", "", head$Value) # get just integers
stri_sub(hv,3,1) <- ".";hv # insert the decimal point in the correct place
```

```
[1] "35."  "37.5" "40."
```

```
head$Value <- hv %>% as.numeric() # make numeric

d <- head
par(las=1,bty="n")
ylim <- round(max(d$Value,10))
with(d,plot(Value,
            col=col1,
            type="b",lwd=3,
            pch=20,
            ylim=c(0,ylim),
            ylab="Head circumference (cm)",
            xlab="Time",
            xaxt="n"
))
axis(1,at=1:4,labels=month.abb[2:5])
# started solids July 2 abline()
title("Head circumference (cm)")
```

Weight

```
require(RColorBrewer)
require(sp)

plot_it(0,"blue","Blues",0.5,"HersheySans")
wv <- gsub("[^[:digit:]]", "", weight$Value) # get just integers
stri_sub(wv,2,1) <- ".";wv # insert the decimal point in the correct place
```

```
 [1] "3.61"  "3.67"  "4.01"  "4.695" "5.1"   "5.5"   "5.5"   "5.73"  "6."    "6.6"
```

```
weight$Value <- wv %>% as.numeric() # make numeric

d <- weight
par(las=1,bty="n")
xlim <- length(weight$Value)
ylim <- round(max(weight$Value,10))
with(d,plot(Value,
            col=col1,
            type="b",lwd=3,
            pch=20,
            ylim=c(0,ylim),
            ylab="Weight (kg)",
            xlab="Time",
            xaxt="n"
))
# axis(1,at=1:xlim,labels=rep(month.abb[2:(xlim/2)],each=2))
# started solids July 2 abline()
title("Weight (kg) over time")
```

Height

```
require(RColorBrewer)
require(sp)

plot_it(0,"blue","Blues",0.5,"HersheySans")
hhv <- gsub("[^[:digit:]]", "", height$Value) # get just integers
stri_sub(hhv,3,1) <- "." ;hhv # insert the decimal point in the correct place
```

```
[1] "53."  "55."  "61.5" "63."
```

```
height$Value <- hhv %>% as.numeric() # make numeric

d <- height
par(las=1,bty="n")
with(d,plot(Value,
            col=col1,
            pch=20,
            type="b",lwd=3,
            ylim=c(0,70),
            ylab="Height (cm)",
            xlab="Time",
            xaxt="n"
))
axis(1,at=1:4,labels=month.abb[2:5])
# axis(1,at=c(0,length(d$Value)),labels=c("",""))# bookending axis tick marks
```

```
# started solids July 2 abline()
title("Height (cm) over time")
```

Feeding

Only time period, no values Started solids July 2

Left breast

Only time period, no values

```
# started solids July 2
head(breast_l)
```

```
# A tibble: 6 x 4
  Activity Trait       Start                 Finish
* <chr>    <chr>       <chr>                 <chr>
1 Feeding  Left Breast 18-Feb.-2018 1:35 am  18-Feb.-2018 1:44 am
2 Feeding  Left Breast 18-Feb.-2018 7:39 am  18-Feb.-2018 8:05 am
3 Feeding  Left Breast 18-Feb.-2018 10:48 am 18-Feb.-2018 11:35 am
4 Feeding  Left Breast 18-Feb.-2018 4:17 pm  18-Feb.-2018 4:17 pm
5 Feeding  Left Breast 18-Feb.-2018 4:20 pm  18-Feb.-2018 4:20 pm
6 Feeding  Left Breast 18-Feb.-2018 5:32 pm  18-Feb.-2018 5:40 pm
```

Right breast

Only time period, no values

```
# started solids July 2
head(breast_r)
```

```
# A tibble: 6 x 4
  Activity Trait        Start                 Finish
* <chr>    <chr>        <chr>                 <chr>
1 Feeding  Right Breast 18-Feb.-2018 1:25 am  18-Feb.-2018 1:35 am
2 Feeding  Right Breast 18-Feb.-2018 3:24 am  18-Feb.-2018 3:45 am
3 Feeding  Right Breast 18-Feb.-2018 10:12 am 18-Feb.-2018 10:45 am
4 Feeding  Right Breast 18-Feb.-2018 3:23 pm  18-Feb.-2018 3:56 pm
5 Feeding  Right Breast 18-Feb.-2018 6:40 pm  18-Feb.-2018 6:52 pm
6 Feeding  Right Breast 18-Feb.-2018 7:02 pm  18-Feb.-2018 7:30 pm
```

Diaper

Only time stamp (count)
Started solids July 2

```
# started solids july 2
unique(diaper$Trait)
```

```
[1] "Pee & Poo" "Poo"       "Pee"
```

Pee

Only time stamp (count)

```
# started solids july 2
which(pee$Start!=pee$Finish) # are there any time periods > 1?
```

```
integer(0)
```

```
nrow(pee)
```

```
[1] 1085
```

Poo

Only time stamp (count)

```
# started solids july 2
which(poo$Start!=poo$Finish) # are there any time periods > 1?
```

```
integer(0)
```

```
nrow(poo)
```

```
[1] 139
```

Both

Only time stamp (count)

```
# started solids july 2
which(both$Start!=both$Finish) # are there any time periods > 1?
```

```
integer(0)
```

```
nrow(both)
```

```
[1] 279
```

Leisure

Only time period, no values

Bath

Only time period, no values

Tummy

Only time period, no values

Outdoors

Only time period, no values

Play

Only time period, no values

Sleep

No values, just time period

```
head(sleep)
```

```
# A tibble: 6 x 3
  Activity Start                 Finish
* <chr>    <chr>                 <chr>
1 Sleep    18-Feb.-2018 8:53 am  18-Feb.-2018 9:41 am
2 Sleep    18-Feb.-2018 11:32 am 18-Feb.-2018 3:16 pm
3 Sleep    18-Feb.-2018 10:24 pm 18-Feb.-2018 10:52 pm
4 Sleep    19-Feb.-2018 1:40 am  19-Feb.-2018 3:00 am
5 Sleep    19-Feb.-2018 3:36 am  19-Feb.-2018 3:38 am
6 Sleep    19-Feb.-2018 5:15 pm  19-Feb.-2018 6:05 pm
```

Lab