03 CSI online aphasia: Spoken - Descriptives

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Load packages

```
library(dplyr)
```

```
##
## Attaching package: 'dplyr'

## The following objects are masked from 'package:stats':
##
##     filter, lag

## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
library(tidyr)

rm(list = ls())
```

Load and preprocess data

```
options( "encoding" = "UTF-8" )

# input
input <- "aphasia_final.csv"

# load data
df <- read.csv(here::here("data", "transient_data_files", input),
               sep = ",",  na = "")
```

Duration of the experiment

```
print("Total duration, not outlier corrected")
```

```
## [1] "Total duration, not outlier corrected"
```

```r
# mean(df$timetotal, na.rm=TRUE) # 33.13 min
mean(df$time_correct)
```

```
## [1] 28.59683
```

```r
sd(df$timetotal) # 21.04 min
```

```
## [1] 21.13194
```

```r
range(df$timetotal) # 15 to 126 min
```

```
## [1]  12.68333 167.58333
```

```r
print("Total duration, split by session")
```

```
## [1] "Total duration, split by session"
```

```r
df %>% group_by(type,session) %>% summarise(mean = mean(timetotal),
                                            median=median(timetotal),
                                        sd = sd(timetotal),
                                        min = min(timetotal),
                                        max = max(timetotal))
```

```
## `summarise()` has grouped output by 'type'. You can override using the
## `.groups` argument.
```

```
## # A tibble: 6 x 7
## # Groups:   type [2]
##   type    session  mean median    sd   min   max
##   <chr>     <int> <dbl>  <dbl> <dbl> <dbl> <dbl>
## 1 PWA           1  39.4   29.5 23.0   21.1 104.
## 2 PWA           2  32.0   27.0 22.8   19.4 126.
## 3 PWA           3  29.2   24.6 13.6   15.0  74.6
## 4 control       1  28.3   19.2 32.3   13.8 168.
## 5 control       2  18.2   17.5  3.62  12.7  26.1
## 6 control       3  19.2   16.4  8.40  13.8  52.0
```

Description of participants

Gender:

```r
(df %>% mutate(gender_char = case_when(gender == 1 ~ "female",
                                       gender == 2 ~ "male")) %>%
  group_by(type, gender_char) %>% count(gender_char) %>%
   mutate(n=n/160/3) -> gender)
```

```
## # A tibble: 4 x 3
## # Groups:   type, gender_char [4]
##   type    gender_char     n
##   <chr>   <chr>       <dbl>
## 1 PWA     female          3
## 2 PWA     male           17
## 3 control female          3
## 4 control male           17
```

```
 # 1 = female, 2 = male, 3 = diverse

print("percentage female:")
```

```
## [1] "percentage female:"
```

```
sum(df$gender == 1)/nrow(df)
```

```
## [1] 0.15
```

Age:

```
print('age:')
```

```
## [1] "age:"
```

```
df %>% group_by(type) %>%
  summarise(mean=round(mean(age),2), sd=round(sd(age),2), min=min(age), max=max(age))
```

```
## # A tibble: 2 x 5
##   type     mean    sd   min   max
##   <chr>   <dbl> <dbl> <int> <int>
## 1 PWA      53.4  5.43    39    62
## 2 control  53.2  5.72    38    62
```

Handedness:

```
# 1 = left handed, 2 = right handed, 3 = ambidexter/both
(handedness <- df %>% mutate(handedness_char = case_when(handedness == 1 ~ "left-handed",
                                    handedness == 2 ~ "right-handed",
                                    handedness==3 ~ "ambidexter/both")) %>%
  group_by(type) %>% count(handedness_char))
```

```
## # A tibble: 5 x 3
## # Groups:   type [2]
##   type    handedness_char     n
##   <chr>   <chr>           <int>
## 1 PWA     left-handed      1600
## 2 PWA     right-handed     8000
## 3 control ambidexter/both   960
## 4 control left-handed      1120
## 5 control right-handed     7520
```

```r
print("percentage right-handed:")
```

```
## [1] "percentage right-handed:"
```

```r
print('PWA')
```

```
## [1] "PWA"
```

```r
sum(df$handedness[df$type=="PWA"] == 2)/nrow(df[df$type=="PWA",])
```

```
## [1] 0.8333333
```

```r
print('control')
```

```
## [1] "control"
```

```r
sum(df$handedness[df$type=="control"] == 2)/nrow(df[df$type=="control",])
```

```
## [1] 0.7833333
```

Mother tongue (experiment was restricted to native German speakers): This seems to have worked

```r
table(df$language) # 1 = yes (mother tongue is German), 2 = no
```

```
##
##     1
## 19200
```

Attention checks

1) Item vs. non-item

```r
## Item vs. non-item
# CH01_01 (Taube), CH01_02 (Apfel), CH02_01 (Luftballon) and CH02_02 (Biene) are items and 2 should be
# CH01_03 (Radio), CH01_04 (Sparschwein), CH02_03 (Laptop) and CH02_04 (Wattestäbchen) are non-items an
## Did participants cheat
# CH03 = 1 - yes, I worked through it till the end,
# CH03 = 2 - no, I stopped or cheated midway
# CH03 = -9 - no answer

attcheck <- data.frame(subject = unique(df$subject))

df <- df %>% mutate(itemvsnonitem1 =
    case_when(CH01_01==2 & CH01_02==2 & CH01_03==1 & CH01_04==1 ~2, # all correct
              CH01_01==2 | CH01_02==2 ~1, # one correct
              CH01_01!=2 & CH01_02!=2 ~0)) %>% # none correct
  dplyr::mutate(itemvsnonitem2 =
    case_when(CH02_01==2 & CH02_02==2 & CH02_03==1 & CH02_04==1 ~2,
              CH02_01==2 | CH02_02==2 ~1,
              CH02_01!=2 & CH02_02!=2 ~0))
df %>% group_by(type, session) %>% count(itemvsnonitem1) %>% mutate(n=n/160)
```

```
## # A tibble: 12 x 4
## # Groups:   type, session [6]
##    type    session itemvsnonitem1     n
##    <chr>     <int>          <dbl> <dbl>
##  1 PWA           1              0     1
##  2 PWA           1              1     6
##  3 PWA           1              2    13
##  4 PWA           2              1     1
##  5 PWA           2              2    19
##  6 PWA           3              1     2
##  7 PWA           3              2    18
##  8 control       1              1     4
##  9 control       1              2    16
## 10 control       2              2    20
## 11 control       3              1     1
## 12 control       3              2    19
```

```
df %>% group_by(type, session) %>% count(itemvsnonitem2) %>% mutate(n=n/160)
```

```
## # A tibble: 13 x 4
## # Groups:   type, session [6]
##    type    session itemvsnonitem2     n
##    <chr>     <int>          <dbl> <dbl>
##  1 PWA           1              1     2
##  2 PWA           1              2    18
##  3 PWA           2              0     1
##  4 PWA           2              1     1
##  5 PWA           2              2    18
##  6 PWA           3              0     1
##  7 PWA           3              1     2
##  8 PWA           3              2    17
##  9 control       1              1     1
## 10 control       1              2    19
## 11 control       2              1     1
## 12 control       2              2    19
## 13 control       3              2    20
```

```
# table(df$itemvsnonitem1)/160
# table(df$itemvsnonitem2)/160
```

All had at leas one item selected correctly in the attention test

2) Cheating

```
df <- df %>% mutate(CH03 = case_when(CH03 == 1 ~
                                       " Ja, ich habe alles bis zum Ende bearbeitet.",
                                           CH03 == 2 ~
                                       "Nein, ich habe zwischendurch aufgehoert oder geschummelt."))
df %>% group_by(type, session) %>% count(CH03) %>% mutate(n=n/160)
```

```
## # A tibble: 9 x 4
## # Groups:   type, session [6]
##   type    session CH03                                                    n
```

```
##   <chr>     <int> <chr>                                                <dbl>
## 1 PWA           1 " Ja, ich habe alles bis zum Ende bearbeitet."          19
## 2 PWA           1 "Nein, ich habe zwischendurch aufgehoert oder geschumme~     1
## 3 PWA           2 " Ja, ich habe alles bis zum Ende bearbeitet."          20
## 4 PWA           3 " Ja, ich habe alles bis zum Ende bearbeitet."          19
## 5 PWA           3 "Nein, ich habe zwischendurch aufgehoert oder geschumme~     1
## 6 control       1 " Ja, ich habe alles bis zum Ende bearbeitet."          20
## 7 control       2 " Ja, ich habe alles bis zum Ende bearbeitet."          20
## 8 control       3 " Ja, ich habe alles bis zum Ende bearbeitet."          19
## 9 control       3 "Nein, ich habe zwischendurch aufgehoert oder geschumme~     1
```

```
table(df$CH03)/160
```

```
##
##               Ja, ich habe alles bis zum Ende bearbeitet.
##                                                       117
## Nein, ich habe zwischendurch aufgehoert oder geschummelt.
##                                                         3
```

Comments

Comments don't indicate any problems that should lead to participant exclusion:

```
table(df$comments)/160
```

```
## numeric(0)
```

Arrays

```
table(df$array)/160
```

```
##
##  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26
##  5  4  3  3  4  4  5  5  4  3  4  4  5  3  4  3  7  5  5  3  3  4  3  3  5  4
## 27 28 29 30
##  4  3  3  5
```

```
x <- df %>% group_by(subject, session) %>% count(array) %>% mutate(n=n/160)
array_rep = 0
for(i in 2:nrow(x)){
  if(x$subject[i-1] == x$subject[i] & x$array[i-1] == x$array[i]){
    array_rep = array_rep+1
  }
}
print(paste0(array_rep, " time an array was repeated within the same participant"))
```

```
## [1] "1 time an array was repeated within the same participant"
```

```r
df %>% group_by(type, session) %>% count(array) %>% mutate(n=n/160) %>% arrange(array)
```

```
## # A tibble: 94 x 4
## # Groups:   type, session [6]
##    type    session array     n
##    <chr>     <int> <int> <dbl>
##  1 PWA           1     1     3
##  2 PWA           3     1     1
##  3 control       2     1     1
##  4 PWA           2     2     1
##  5 PWA           3     2     2
##  6 control       2     2     1
##  7 control       1     3     1
##  8 control       2     3     1
##  9 control       3     3     1
## 10 PWA           1     4     1
## # i 84 more rows
```

```r
df %>% count(array) %>% mutate(n=n/160)
```

```
##    array n
## 1      1 5
## 2      2 4
## 3      3 3
## 4      4 3
## 5      5 4
## 6      6 4
## 7      7 5
## 8      8 5
## 9      9 4
## 10    10 3
## 11    11 4
## 12    12 4
## 13    13 5
## 14    14 3
## 15    15 4
## 16    16 3
## 17    17 7
## 18    18 5
## 19    19 5
## 20    20 3
## 21    21 3
## 22    22 4
## 23    23 3
## 24    24 3
## 25    25 5
## 26    26 4
## 27    27 4
## 28    28 3
## 29    29 3
## 30    30 5
```

Get an overview of the computer setups

Information was read-out automatically from SoSci Survey SD22_PRV (provider): 1 = Android 2 = Apple 3 = BlackBerry 4 = PlayBook 5 = Kindle 6 = Microsoft -1 = Sonstige oder unbekannt

SD22_OS (OS): 10 = Windows NT 11 = Windows Vista 12 = Windows 7 13 = Windows 8 15 = Windows 10 20 = Linux 30 = MaxOS X 40 = iOS 50 = Android -1 = Sonstiges -2 = unbekannt

SD22_BID (Browser-Identification (HTTP_USER_AGENT))

SD22_BNM (Browser) 1 = Android WebView 2 = Chrome 3 = Chromium 4 = Coast 5 = Firefox 6 = IE 7 = Opera 8 = Safari 9 = Edge 10 = Safari WebView 11 = IE (mobile) 12 = Edge (mobile) -1 = Sonstiges -2 = Default Browser -3 = unbekannt

SD22_BVS (Browser-version)

SD22_FmF (Format) 1 = Computer 2 = Fernsehgerät 3 = Tablet 4 = Mobilgerät 5 = Smartphone -2 = unbekannt

SD22_ScW (screen width [Pixel]) SD22_ScH (screen [Pixel]

SD22_QnW (questionnaire width [Pixel])

```
#colnames(df)

df <- df %>% mutate(SD22_OS=as.character(as.numeric(SD22_OS))) %>%
  mutate(os_system = case_when(
  SD22_OS==10  ~ "Windows NT",
  SD22_OS==11  ~ "Windows Vista",
  SD22_OS==12  ~ "Windows 7",
  SD22_OS==13  ~ "Windows 8",
  SD22_OS==15  ~ "Windows 10",
  SD22_OS==20  ~ "Linux",
  SD22_OS==30  ~ "MaxOS X",
  SD22_OS==40  ~ "iOS",
  SD22_OS==50  ~ "Android",
  SD22_OS==-1  ~ "other",
  SD22_OS==-2  ~ "unknown")) %>%
  mutate(os_system_raw=case_when(
  SD22_OS==10  ~ "Windows",
  SD22_OS==11  ~ "Windows",
  SD22_OS==12  ~ "Windows",
  SD22_OS==13  ~ "Windows",
  SD22_OS==15  ~ "Windows",
  SD22_OS==20  ~ "Linux",
  SD22_OS==30  ~ "Apple",
  SD22_OS==40  ~ "Apple",
  SD22_OS==50  ~ "Android",
  SD22_OS==-1  ~ "other",
  SD22_OS==-2  ~ "unknown"))
df %>% group_by(os_system) %>% count() %>% mutate(n=n/40/3)
```

```
## # A tibble: 5 x 2
## # Groups:   os_system [5]
##   os_system      n
##   <chr>      <dbl>
## 1 MaxOS X       12
```

```
## 2 Windows 10    32
## 3 Windows 7      4
## 4 Windows 8      4
## 5 unknown      108
```

```
df %>% group_by(os_system_raw) %>% count() %>% mutate(n=n/40/3)
```

```
## # A tibble: 3 x 2
## # Groups:   os_system_raw [3]
##   os_system_raw     n
##   <chr>         <dbl>
## 1 Apple            12
## 2 Windows          40
## 3 unknown         108
```

```
# df <- df %>% mutate(SD22_PRV=as.character(as.numeric(SD22_PRV))) %>%
#   mutate(provider = case_when(
#   SD22_PRV==1  ~ "Android",
#   SD22_PRV==2  ~ "Apple",
#   SSD22_PRV==3  ~ "BlackBerry",
#   SD22_PRV==4  ~ "PlayBook",
#   SD22_PRV==5  ~ "Kindle",
#   SD22_PRV==6  ~ "Microsoft",
#   SD22_PRV==-1  ~ "other or unknown"))
# df %>% group_by(provider) %>% count() %>% mutate(n=n/40/3)


#df %>% group_by(SD22_BID) %>% count() %>% mutate(n=n/40/3)

df <- df %>% mutate(SD22_BNM=as.character(as.numeric(SD22_BNM))) %>%
  mutate(browser = case_when(
  SD22_BNM==1  ~ "Android WebView",
  SD22_BNM==2  ~ "Chrome",
  SD22_BNM==3  ~ "Chromium",
  SD22_BNM==4  ~ "Coast",
  SD22_BNM==5  ~ "Firefox",
  SD22_BNM==6  ~ "IE",
  SD22_BNM==7  ~ "Opera",
  SD22_BNM==8  ~ "Safari",
  SD22_BNM==9  ~ "Edge",
  SD22_BNM==10  ~ "Safari WebView",
  SD22_BNM==11  ~ "IE (mobile)",
  SD22_BNM==12  ~ "Edge (mobile)",
  SD22_BNM==-1  ~ "other",
  SD22_BNM==-2  ~ "default browser",
  SD22_BNM==-3  ~ "unknown"))

#df %>% group_by(SD22_BVS) %>% count() %>% mutate(n=n/40/3) # browser version

df <- df %>% mutate(SD22_FmF=as.character(as.numeric(SD22_FmF))) %>%
  mutate(system_format = case_when(
  SD22_FmF==1  ~ "Computer",
  SD22_FmF==2  ~ "Television",
```

```
  SD22_FmF==3  ~ "Tablet",
  SD22_FmF==4  ~ "Mobile device",
  SD22_FmF==5  ~ "Smartphone",
  SD22_BNM==-2  ~ "unknown"))
df %>% group_by(system_format) %>% count() %>% mutate(n=n/40/3)
```

```
## # A tibble: 2 x 2
## # Groups:   system_format [2]
##   system_format      n
##   <chr>          <dbl>
## 1 Computer      153.
## 2 Tablet          6.67
```

```
df <- df %>% mutate(screen_width=as.character(as.numeric(SD22_ScW)))
df %>% group_by(screen_width) %>% count() %>% mutate(n=n/40/3)
```

```
## # A tibble: 10 x 2
## # Groups:   screen_width [10]
##    screen_width     n
##    <chr>        <dbl>
##  1 1024           4
##  2 1280          12
##  3 1366          58.7
##  4 1368           4
##  5 1440           8
##  6 1536          16
##  7 1600          12
##  8 1768           4
##  9 1920          37.3
## 10 2560           4
```

```
df <- df %>% mutate(screen_height=as.character(as.numeric(SD22_ScH)))
df %>% group_by(screen_height) %>% count() %>% mutate(n=n/40/3)
```

```
## # A tibble: 12 x 2
## # Groups:   screen_height [12]
##    screen_height     n
##    <chr>         <dbl>
##  1 1000           4
##  2 1080          21.3
##  3 1200          16
##  4 1440           4
##  5 720            5.33
##  6 768           62.7
##  7 800            6.67
##  8 864           16
##  9 900           12
## 10 912            4
## 11 960            4
## 12 992            4
```

```
df <- df %>% mutate(questionnaire_width=as.character(as.numeric(SD22_QnW)))
df %>% group_by(questionnaire_width) %>% count() %>% mutate(n=n/40/3)
```

```
## # A tibble: 2 x 2
## # Groups:   questionnaire_width [2]
##   questionnaire_width     n
##   <chr>               <dbl>
## 1 799                     4
## 2 800                   156
```

```
(df %>% group_by(subject, session) %>% select(SD22_BID, os_system_raw,
                                              os_system, browser,
                                              system_format,
                                              screen_width, screen_height,
                                              questionnaire_width) %>%
  unique() -> setup_overview)
```

```
## Adding missing grouping variables: `subject`, `session`
```

```
## # A tibble: 120 x 10
## # Groups:   subject, session [120]
##    subject session SD22_BID        os_system_raw os_system browser system_format
##      <int>   <int> <chr>           <chr>         <chr>     <chr>   <chr>
##  1     101       1 Mozilla/5.0 (W~ unknown       unknown   defaul~ Computer
##  2     101       2 Mozilla/5.0 (W~ unknown       unknown   defaul~ Computer
##  3     101       3 Mozilla/5.0 (W~ unknown       unknown   defaul~ Computer
##  4     102       1 Mozilla/5.0 (W~ unknown       unknown   defaul~ Computer
##  5     102       2 Mozilla/5.0 (W~ unknown       unknown   defaul~ Computer
##  6     102       3 Mozilla/5.0 (W~ unknown       unknown   defaul~ Computer
##  7     103       1 Mozilla/5.0 (W~ unknown       unknown   defaul~ Computer
##  8     103       2 Mozilla/5.0 (W~ unknown       unknown   defaul~ Computer
##  9     103       3 Mozilla/5.0 (W~ unknown       unknown   defaul~ Computer
## 10     104       1 Mozilla/5.0 (M~ Apple         MaxOS X   Firefox Computer
## # i 110 more rows
## # i 3 more variables: screen_width <chr>, screen_height <chr>,
## #   questionnaire_width <chr>
```

```
## save this table and anonymize by hand
write.csv(setup_overview,here::here("data", "transient_data_files", "setup_overview_all.csv"),
            row.names = FALSE)
```

Load manually cleaned overview and create table

```
setups <- read.csv2(here::here("data", "transient_data_files",
                               "setup_overview_cleaned.csv"))
setups %>% group_by(OS) %>% count()
```

```
## # A tibble: 6 x 2
## # Groups:   OS [6]
##   OS                                      n
##   <chr>                               <int>
```

```
## 1 MaxOS X                                    4
## 2 Samsung Galaxy Tab A 9.7                   1
## 3 Windows 10                                30
## 4 Windows 10 (Android on day2 and day8)      1
## 5 Windows 7                                  1
## 6 Windows 8                                  3
```

```
setups %>%
  mutate(group=case_when(subject<200 ~ "PWA", subject >200 ~"Control")) %>%
  group_by(group,browser) %>% count()
```

```
## # A tibble: 9 x 3
## # Groups:   group, browser [9]
##   group   browser                   n
##   <chr>   <chr>                 <int>
## 1 Control Chrome                    5
## 2 Control Edge                      3
## 3 Control Firefox                   9
## 4 Control Opera                     2
## 5 Control SamsungBrowser            1
## 6 PWA     Chrome                    2
## 7 PWA     Chrome (Edge on day8)     1
## 8 PWA     Edge                     13
## 9 PWA     Firefox                   4
```

```
setups %>% group_by(system_format) %>% count()
```

```
## # A tibble: 3 x 2
## # Groups:   system_format [3]
##   system_format                           n
##   <chr>                               <int>
## 1 Computer                               38
## 2 Computer (Tablet  on day2 and day8)     1
## 3 Tablet                                  1
```

```
setups %>% group_by(test_location) %>% count()
```

```
## # A tibble: 2 x 2
## # Groups:   test_location [2]
##   test_location     n
##   <chr>         <int>
## 1 clinic           12
## 2 home             28
```

```
setups %>% group_by(screen_width) %>% count()
```

```
## # A tibble: 11 x 2
## # Groups:   screen_width [11]
##    screen_width             n
##    <chr>                <int>
##  1 1024                     1
```

```
##  2 1280                     2
##  3 1366                    14
##  4 1366 (1280 on day 8)     1
##  5 1368                     1
##  6 1440                     2
##  7 1536                     4
##  8 1600                     3
##  9 1768                     1
## 10 1920                    10
## 11 2560                     1
```

```
setups %>%
  mutate(screen_width=case_when(screen_width=="1366 (1280 on day 8)" ~ 1366,
                                TRUE ~ as.numeric(as.character(screen_width)))) %>%
  summarise(min=min(screen_width), max=max(screen_width),
            mean=mean(screen_width), sd=sd(screen_width))
```

```
## Warning: There was 1 warning in `mutate()`.
## i In argument: `screen_width = case_when(...)`.
## Caused by warning:
## ! NAs introduced by coercion
```

```
##    min  max    mean       sd
## 1 1024 2560 1569.85 295.9897
```

```
setups %>% group_by(screen_height) %>% count()
```

```
## # A tibble: 13 x 2
## # Groups:   screen_height [13]
##    screen_height          n
##    <chr>              <int>
##  1 1000                   1
##  2 1080                   6
##  3 1200                   4
##  4 1440                   1
##  5 720                    1
##  6 768                   15
##  7 768 (720  on day8)     1
##  8 800                    1
##  9 864                    4
## 10 900                    3
## 11 912                    1
## 12 960                    1
## 13 992                    1
```

```
setups %>%
  mutate(screen_height=case_when(screen_height=="768 (720  on day8)" ~ 768,
                                 TRUE ~ as.numeric(as.character(screen_height)))) %>%
  summarise(min=min(screen_height), max=max(screen_height),
            mean=mean(screen_height), sd=sd(screen_height))
```

```
## Warning: There was 1 warning in `mutate()`.
```

```
## i In argument: 'screen_height = case_when(...)'.
## Caused by warning:
## ! NAs introduced by coercion
```

```
##   min  max  mean       sd
## 1 720 1440 913.7 174.4639
```

```
setups %>% group_by(questionnaire_width) %>% count()
```

```
## # A tibble: 2 x 2
## # Groups:   questionnaire_width [2]
##   questionnaire_width     n
##                 <int> <int>
## 1                 799     1
## 2                 800    39
```

Fully anonymize data and reduce data frame

```
# df_a <- df %>% dplyr::select(!"gender" & !starts_with("language") &
#                                !starts_with("handedness") &
#                                !starts_with("fingers") &
#                                 !starts_with("KB") &
#                                !starts_with("CHO") &
#                                !"comments" & !"type" &
#                               #!"gender_char" &
#                                !"itemvsnonitem1" &
#                                !"itemvsnonitem2" &
#                                !starts_with("MC") &
#                                !starts_with("SD") &
#                                !c("os_system", "os_system_raw",
#                                   "browser", "screen_width",
#                                   "system_format",
#                                   "questionnaire_width",
#                                   "screen_height", "OR02_01", "array") &
#                                ! "age"
#                              # !"name" & !"time_wo_outlier"
#                                )
```

```
#write.csv(df_a, here::here("data","data_long_anonymous.csv"))
```