Workshop 1 write-up

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9/26/2018

library(tidyverse)

## ── Attaching packages ────────────────────────────────── tidyverse 1.2.1 ──

## ✔ ggplot2 2.2.1 ✔ purrr 0.2.4  
## ✔ tibble 1.4.2 ✔ dplyr 0.7.4  
## ✔ tidyr 0.8.0 ✔ stringr 1.3.1  
## ✔ readr 1.1.1 ✔ forcats 0.3.0

## ── Conflicts ───────────────────────────────────── tidyverse\_conflicts() ──  
## ✖ dplyr::filter() masks stats::filter()  
## ✖ dplyr::lag() masks stats::lag()

cs\_reading <- read.csv("L2CS\_Word8\_Ps11\_20.csv")  
str(cs\_reading)

## 'data.frame': 692 obs. of 246 variables:  
## $ RECORDING\_SESSION\_LABEL : int 20 20 20 20 20 20 20 20 20 20 ...  
## $ TRIAL\_INDEX : int 1 2 3 4 5 7 8 9 10 11 ...  
## $ CURRENT\_FIX\_ADJUSTED : logi FALSE FALSE FALSE FALSE FALSE FALSE ...  
## $ CURRENT\_FIX\_BLINK\_AROUND : Factor w/ 4 levels "AFTER","BEFORE",..: 4 4 4 4 4 4 4 2 4 4 ...  
## $ CURRENT\_FIX\_BUTTON\_0\_PRESS : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ CURRENT\_FIX\_BUTTON\_1\_PRESS : Factor w/ 380 levels ".","10050","10060",..: 1 237 1 1 214 190 271 263 300 290 ...  
## $ CURRENT\_FIX\_BUTTON\_2\_PRESS : Factor w/ 299 levels ".","10040","10127",..: 244 1 214 261 1 1 1 1 1 1 ...  
## $ CURRENT\_FIX\_BUTTON\_3\_PRESS : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ CURRENT\_FIX\_BUTTON\_4\_PRESS : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ CURRENT\_FIX\_BUTTON\_5\_PRESS : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ CURRENT\_FIX\_BUTTON\_6\_PRESS : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ CURRENT\_FIX\_BUTTON\_7\_PRESS : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ CURRENT\_FIX\_BUTTON\_8\_PRESS : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ CURRENT\_FIX\_END : int 8223 6106 7569 8755 5354 4237 6848 6744 7574 7331 ...  
## $ CURRENT\_FIX\_END\_OTHER : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ CURRENT\_FIX\_INPUT\_EVENTS : Factor w/ 643 levels "[(10040,63)]",..: 533 374 486 568 329 279 429 419 487 470 ...  
## $ CURRENT\_FIX\_INTEREST\_AREAS : Factor w/ 13 levels "[ ]","[ 1]","[ 10]",..: 1 1 1 1 12 1 11 9 11 1 ...  
## $ CURRENT\_FIX\_INTEREST\_AREA\_DATA : Factor w/ 308 levels ".","[STATIC, RECTANGLE, 160.0, 496.0, 280.0, 579.0]",..: 1 1 1 1 254 1 223 86 225 1 ...  
## $ CURRENT\_FIX\_INTEREST\_AREA\_DWELL\_TIME : Factor w/ 520 levels ".","1000","1004",..: 1 1 1 1 425 1 301 141 278 1 ...  
## $ CURRENT\_FIX\_INTEREST\_AREA\_FIX\_COUNT : Factor w/ 24 levels ".","1","10","11",..: 1 1 1 1 12 1 2 21 12 1 ...  
## $ CURRENT\_FIX\_INTEREST\_AREA\_GROUP : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ CURRENT\_FIX\_INTEREST\_AREA\_ID : Factor w/ 13 levels ".","1","10","11",..: 1 1 1 1 12 1 11 9 11 1 ...  
## $ CURRENT\_FIX\_INTEREST\_AREA\_LABEL : Factor w/ 228 levels ".","about","abriendo",..: 1 1 1 1 177 1 69 202 144 1 ...  
## $ CURRENT\_FIX\_INTEREST\_AREA\_PIXEL\_AREA : Factor w/ 48 levels ".","10043","10126",..: 1 1 1 1 30 1 30 13 29 1 ...  
## $ CURRENT\_FIX\_INTEREST\_AREA\_RUN\_ID : Factor w/ 16 levels ".","1","10","11",..: 1 1 1 1 8 1 2 8 8 1 ...  
## $ CURRENT\_FIX\_INTEREST\_AREA\_X\_OFFSET : Factor w/ 465 levels "-0.1","-0.3",..: 229 229 229 229 188 229 315 249 274 229 ...  
## $ CURRENT\_FIX\_INTEREST\_AREA\_Y\_OFFSET : Factor w/ 382 levels "-0.2","-0.3",..: 140 140 140 140 332 140 344 245 295 140 ...  
## $ CURRENT\_FIX\_IS\_RT\_END : logi FALSE FALSE FALSE FALSE FALSE FALSE ...  
## $ CURRENT\_FIX\_LABEL : Factor w/ 681 levels "Fixation: 10004 ms",..: 463 380 497 573 344 287 439 439 527 500 ...  
## $ CURRENT\_FIX\_MSG\_COUNT : int 1 1 1 1 1 1 1 1 1 1 ...  
## $ CURRENT\_FIX\_MSG\_TEXT\_1 : Factor w/ 4 levels ".","blank\_screen",..: 4 4 4 4 4 4 4 4 4 4 ...  
## $ CURRENT\_FIX\_MSG\_TIME\_1 : Factor w/ 626 levels ".","10041","10051",..: 520 366 473 555 323 275 418 409 474 456 ...  
## $ CURRENT\_FIX\_NEAREST\_INTEREST\_AREA : Factor w/ 13 levels ".","1","10","11",..: 11 12 10 11 12 11 11 9 11 11 ...  
## $ CURRENT\_FIX\_NEAREST\_INTEREST\_AREA\_DISTANCE : Factor w/ 151 levels ".","0.03","0.04",..: 81 79 89 126 62 75 76 42 58 87 ...  
## $ CURRENT\_FIX\_NEAREST\_INTEREST\_AREA\_LABEL : Factor w/ 247 levels ".","about","abriendo",..: 211 142 142 149 190 225 72 217 156 15 ...  
## $ CURRENT\_FIX\_PUPIL : int 1209 1094 1015 1053 956 1006 843 910 952 1051 ...  
## $ CURRENT\_FIX\_REFIX\_INTEREST\_AREA : Factor w/ 40 levels ".","0","1","10",..: 1 1 1 1 39 1 2 37 16 1 ...  
## $ CURRENT\_FIX\_REFIX\_PREV\_INTEREST\_AREA : Factor w/ 3 levels ".","0","1": 1 1 1 1 3 1 3 3 3 1 ...  
## $ CURRENT\_FIX\_RUN\_DWELL\_TIME : Factor w/ 395 levels ".","100","102",..: 1 1 1 1 110 1 186 283 356 1 ...  
## $ CURRENT\_FIX\_RUN\_INDEX : Factor w/ 8 levels ".","1","2","3",..: 1 1 1 1 2 1 2 3 2 1 ...  
## $ CURRENT\_FIX\_RUN\_SIZE : Factor w/ 8 levels ".","1","2","3",..: 1 1 1 1 2 1 2 3 2 1 ...  
## $ CURRENT\_FIX\_START : int 6804 5701 7217 8225 5135 4044 6525 6525 7495 7252 ...  
## $ CURRENT\_FIX\_START\_OTHER : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ CURRENT\_FIX\_TRIAL\_SPAN : Factor w/ 1 level "SPAN\_NONE": 1 1 1 1 1 1 1 1 1 1 ...  
## $ CURRENT\_FIX\_X : num 571 577 651 662 634 ...  
## $ CURRENT\_FIX\_X\_OTHER : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ CURRENT\_FIX\_X\_RESOLUTION : num 61.9 61.9 61.6 61.6 61.6 ...  
## $ CURRENT\_FIX\_Y : num 585 586 586 593 576 ...  
## $ CURRENT\_FIX\_Y\_OTHER : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ CURRENT\_FIX\_Y\_RESOLUTION : num 61.1 61.1 61 61 61 ...  
## $ DATA\_FILE : Factor w/ 10 levels "11.edf","12.edf",..: 10 10 10 10 10 10 10 10 10 10 ...  
## $ EYE\_USED : Factor w/ 1 level "RIGHT": 1 1 1 1 1 1 1 1 1 1 ...  
## $ IP\_END\_EVENT\_MATCHED : logi TRUE TRUE TRUE TRUE TRUE TRUE ...  
## $ IP\_END\_TIME : int 276062 284662 293612 304996 311780 324680 335130 344046 353363 362496 ...  
## $ IP\_INDEX : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ IP\_LABEL : Factor w/ 1 level "Full Trial Period": 1 1 1 1 1 1 1 1 1 1 ...  
## $ IP\_START\_EVENT\_MATCHED : logi TRUE TRUE TRUE TRUE TRUE TRUE ...  
## $ IP\_START\_TIME : int 267837 278554 286041 296239 306424 320441 328280 337300 345787 355163 ...  
## $ LAST\_BUTTON\_PRESSED : Factor w/ 4 levels ".","1","2","3": 3 2 3 3 2 2 2 2 2 2 ...  
## $ LAST\_BUTTON\_PRESSED\_TIME : Factor w/ 668 levels ".","10040","10050",..: 556 396 508 592 350 299 451 442 509 490 ...  
## $ LAST\_BUTTON\_RELEASED : Factor w/ 5 levels ".","1","2","3",..: 2 2 2 2 2 2 2 2 2 2 ...  
## $ LAST\_BUTTON\_RELEASED\_TIME : Factor w/ 677 levels ".","10049","10059",..: 423 335 496 526 337 230 449 421 431 511 ...  
## $ LAST\_BUTTON\_TIME : Factor w/ 668 levels ".","10040","10050",..: 556 395 507 592 350 299 451 442 508 489 ...  
## $ NEXT\_FIX\_ANGLE : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_BLINK\_AROUND : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_DIRECTION : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_DISTANCE : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_DURATION : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_END : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_END\_OTHER : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_INPUT\_EVENTS : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_INTEREST\_AREAS : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_INTEREST\_AREA\_DATA : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_INTEREST\_AREA\_DWELL\_TIME : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_INTEREST\_AREA\_FIX\_COUNT : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_INTEREST\_AREA\_GROUP : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_INTEREST\_AREA\_ID : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_INTEREST\_AREA\_INDEX : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_INTEREST\_AREA\_LABEL : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_INTEREST\_AREA\_PIXEL\_AREA : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_INTEREST\_AREA\_RUN\_ID : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_IS\_RT\_END : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_LABEL : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_MSG\_COUNT : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_MSG\_TEXT\_1 : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_MSG\_TIME\_1 : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_NEAREST\_INTEREST\_AREA : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_NEAREST\_INTEREST\_AREA\_DISTANCE : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_NEAREST\_INTEREST\_AREA\_LABEL : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_PUPIL : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_RUN\_DWELL\_TIME : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_RUN\_INDEX : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_RUN\_SIZE : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_START : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_START\_OTHER : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_TRIAL\_SPAN : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_X : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_X\_OTHER : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## $ NEXT\_FIX\_X\_RESOLUTION : Factor w/ 1 level ".": 1 1 1 1 1 1 1 1 1 1 ...  
## [list output truncated]

names(cs\_reading)

## [1] "RECORDING\_SESSION\_LABEL"   
## [2] "TRIAL\_INDEX"   
## [3] "CURRENT\_FIX\_ADJUSTED"   
## [4] "CURRENT\_FIX\_BLINK\_AROUND"   
## [5] "CURRENT\_FIX\_BUTTON\_0\_PRESS"   
## [6] "CURRENT\_FIX\_BUTTON\_1\_PRESS"   
## [7] "CURRENT\_FIX\_BUTTON\_2\_PRESS"   
## [8] "CURRENT\_FIX\_BUTTON\_3\_PRESS"   
## [9] "CURRENT\_FIX\_BUTTON\_4\_PRESS"   
## [10] "CURRENT\_FIX\_BUTTON\_5\_PRESS"   
## [11] "CURRENT\_FIX\_BUTTON\_6\_PRESS"   
## [12] "CURRENT\_FIX\_BUTTON\_7\_PRESS"   
## [13] "CURRENT\_FIX\_BUTTON\_8\_PRESS"   
## [14] "CURRENT\_FIX\_END"   
## [15] "CURRENT\_FIX\_END\_OTHER"   
## [16] "CURRENT\_FIX\_INPUT\_EVENTS"   
## [17] "CURRENT\_FIX\_INTEREST\_AREAS"   
## [18] "CURRENT\_FIX\_INTEREST\_AREA\_DATA"   
## [19] "CURRENT\_FIX\_INTEREST\_AREA\_DWELL\_TIME"   
## [20] "CURRENT\_FIX\_INTEREST\_AREA\_FIX\_COUNT"   
## [21] "CURRENT\_FIX\_INTEREST\_AREA\_GROUP"   
## [22] "CURRENT\_FIX\_INTEREST\_AREA\_ID"   
## [23] "CURRENT\_FIX\_INTEREST\_AREA\_LABEL"   
## [24] "CURRENT\_FIX\_INTEREST\_AREA\_PIXEL\_AREA"   
## [25] "CURRENT\_FIX\_INTEREST\_AREA\_RUN\_ID"   
## [26] "CURRENT\_FIX\_INTEREST\_AREA\_X\_OFFSET"   
## [27] "CURRENT\_FIX\_INTEREST\_AREA\_Y\_OFFSET"   
## [28] "CURRENT\_FIX\_IS\_RT\_END"   
## [29] "CURRENT\_FIX\_LABEL"   
## [30] "CURRENT\_FIX\_MSG\_COUNT"   
## [31] "CURRENT\_FIX\_MSG\_TEXT\_1"   
## [32] "CURRENT\_FIX\_MSG\_TIME\_1"   
## [33] "CURRENT\_FIX\_NEAREST\_INTEREST\_AREA"   
## [34] "CURRENT\_FIX\_NEAREST\_INTEREST\_AREA\_DISTANCE"   
## [35] "CURRENT\_FIX\_NEAREST\_INTEREST\_AREA\_LABEL"   
## [36] "CURRENT\_FIX\_PUPIL"   
## [37] "CURRENT\_FIX\_REFIX\_INTEREST\_AREA"   
## [38] "CURRENT\_FIX\_REFIX\_PREV\_INTEREST\_AREA"   
## [39] "CURRENT\_FIX\_RUN\_DWELL\_TIME"   
## [40] "CURRENT\_FIX\_RUN\_INDEX"   
## [41] "CURRENT\_FIX\_RUN\_SIZE"   
## [42] "CURRENT\_FIX\_START"   
## [43] "CURRENT\_FIX\_START\_OTHER"   
## [44] "CURRENT\_FIX\_TRIAL\_SPAN"   
## [45] "CURRENT\_FIX\_X"   
## [46] "CURRENT\_FIX\_X\_OTHER"   
## [47] "CURRENT\_FIX\_X\_RESOLUTION"   
## [48] "CURRENT\_FIX\_Y"   
## [49] "CURRENT\_FIX\_Y\_OTHER"   
## [50] "CURRENT\_FIX\_Y\_RESOLUTION"   
## [51] "DATA\_FILE"   
## [52] "EYE\_USED"   
## [53] "IP\_END\_EVENT\_MATCHED"   
## [54] "IP\_END\_TIME"   
## [55] "IP\_INDEX"   
## [56] "IP\_LABEL"   
## [57] "IP\_START\_EVENT\_MATCHED"   
## [58] "IP\_START\_TIME"   
## [59] "LAST\_BUTTON\_PRESSED"   
## [60] "LAST\_BUTTON\_PRESSED\_TIME"   
## [61] "LAST\_BUTTON\_RELEASED"   
## [62] "LAST\_BUTTON\_RELEASED\_TIME"   
## [63] "LAST\_BUTTON\_TIME"   
## [64] "NEXT\_FIX\_ANGLE"   
## [65] "NEXT\_FIX\_BLINK\_AROUND"   
## [66] "NEXT\_FIX\_DIRECTION"   
## [67] "NEXT\_FIX\_DISTANCE"   
## [68] "NEXT\_FIX\_DURATION"   
## [69] "NEXT\_FIX\_END"   
## [70] "NEXT\_FIX\_END\_OTHER"   
## [71] "NEXT\_FIX\_INPUT\_EVENTS"   
## [72] "NEXT\_FIX\_INTEREST\_AREAS"   
## [73] "NEXT\_FIX\_INTEREST\_AREA\_DATA"   
## [74] "NEXT\_FIX\_INTEREST\_AREA\_DWELL\_TIME"   
## [75] "NEXT\_FIX\_INTEREST\_AREA\_FIX\_COUNT"   
## [76] "NEXT\_FIX\_INTEREST\_AREA\_GROUP"   
## [77] "NEXT\_FIX\_INTEREST\_AREA\_ID"   
## [78] "NEXT\_FIX\_INTEREST\_AREA\_INDEX"   
## [79] "NEXT\_FIX\_INTEREST\_AREA\_LABEL"   
## [80] "NEXT\_FIX\_INTEREST\_AREA\_PIXEL\_AREA"   
## [81] "NEXT\_FIX\_INTEREST\_AREA\_RUN\_ID"   
## [82] "NEXT\_FIX\_IS\_RT\_END"   
## [83] "NEXT\_FIX\_LABEL"   
## [84] "NEXT\_FIX\_MSG\_COUNT"   
## [85] "NEXT\_FIX\_MSG\_TEXT\_1"   
## [86] "NEXT\_FIX\_MSG\_TIME\_1"   
## [87] "NEXT\_FIX\_NEAREST\_INTEREST\_AREA"   
## [88] "NEXT\_FIX\_NEAREST\_INTEREST\_AREA\_DISTANCE"   
## [89] "NEXT\_FIX\_NEAREST\_INTEREST\_AREA\_LABEL"   
## [90] "NEXT\_FIX\_PUPIL"   
## [91] "NEXT\_FIX\_RUN\_DWELL\_TIME"   
## [92] "NEXT\_FIX\_RUN\_INDEX"   
## [93] "NEXT\_FIX\_RUN\_SIZE"   
## [94] "NEXT\_FIX\_START"   
## [95] "NEXT\_FIX\_START\_OTHER"   
## [96] "NEXT\_FIX\_TRIAL\_SPAN"   
## [97] "NEXT\_FIX\_X"   
## [98] "NEXT\_FIX\_X\_OTHER"   
## [99] "NEXT\_FIX\_X\_RESOLUTION"   
## [100] "NEXT\_FIX\_Y"   
## [101] "NEXT\_FIX\_Y\_OTHER"   
## [102] "NEXT\_FIX\_Y\_RESOLUTION"   
## [103] "NEXT\_SAC\_AMPLITUDE"   
## [104] "NEXT\_SAC\_ANGLE"   
## [105] "NEXT\_SAC\_AVG\_VELOCITY"   
## [106] "NEXT\_SAC\_BLINK\_DURATION"   
## [107] "NEXT\_SAC\_BLINK\_END"   
## [108] "NEXT\_SAC\_BLINK\_START"   
## [109] "NEXT\_SAC\_CONTAINS\_BLINK"   
## [110] "NEXT\_SAC\_DIRECTION"   
## [111] "NEXT\_SAC\_DURATION"   
## [112] "NEXT\_SAC\_END\_INTEREST\_AREAS"   
## [113] "NEXT\_SAC\_END\_INTEREST\_AREA\_ID"   
## [114] "NEXT\_SAC\_END\_INTEREST\_AREA\_INDEX"   
## [115] "NEXT\_SAC\_END\_INTEREST\_AREA\_LABEL"   
## [116] "NEXT\_SAC\_END\_TIME"   
## [117] "NEXT\_SAC\_END\_X"   
## [118] "NEXT\_SAC\_END\_X\_RESOLUTION"   
## [119] "NEXT\_SAC\_END\_Y"   
## [120] "NEXT\_SAC\_END\_Y\_RESOLUTION"   
## [121] "NEXT\_SAC\_INDEX"   
## [122] "NEXT\_SAC\_INPUT\_EVENTS"   
## [123] "NEXT\_SAC\_IS\_RT\_END"   
## [124] "NEXT\_SAC\_LABEL"   
## [125] "NEXT\_SAC\_MSG\_COUNT"   
## [126] "NEXT\_SAC\_MSG\_TEXT\_1"   
## [127] "NEXT\_SAC\_MSG\_TIME\_1"   
## [128] "NEXT\_SAC\_NEAREST\_END\_INTEREST\_AREA"   
## [129] "NEXT\_SAC\_NEAREST\_END\_INTEREST\_AREA\_LABEL"   
## [130] "NEXT\_SAC\_NEAREST\_START\_INTEREST\_AREA"   
## [131] "NEXT\_SAC\_NEAREST\_START\_INTEREST\_AREA\_LABEL"   
## [132] "NEXT\_SAC\_PEAK\_VELOCITY"   
## [133] "NEXT\_SAC\_START\_INTEREST\_AREAS"   
## [134] "NEXT\_SAC\_START\_INTEREST\_AREA\_ID"   
## [135] "NEXT\_SAC\_START\_INTEREST\_AREA\_INDEX"   
## [136] "NEXT\_SAC\_START\_INTEREST\_AREA\_LABEL"   
## [137] "NEXT\_SAC\_START\_TIME"   
## [138] "NEXT\_SAC\_START\_X"   
## [139] "NEXT\_SAC\_START\_X\_RESOLUTION"   
## [140] "NEXT\_SAC\_START\_Y"   
## [141] "NEXT\_SAC\_START\_Y\_RESOLUTION"   
## [142] "PREVIOUS\_FIX\_ANGLE"   
## [143] "PREVIOUS\_FIX\_BLINK\_AROUND"   
## [144] "PREVIOUS\_FIX\_DIRECTION"   
## [145] "PREVIOUS\_FIX\_DISTANCE"   
## [146] "PREVIOUS\_FIX\_DURATION"   
## [147] "PREVIOUS\_FIX\_END"   
## [148] "PREVIOUS\_FIX\_END\_OTHER"   
## [149] "PREVIOUS\_FIX\_INPUT\_EVENTS"   
## [150] "PREVIOUS\_FIX\_INTEREST\_AREAS"   
## [151] "PREVIOUS\_FIX\_INTEREST\_AREA\_DATA"   
## [152] "PREVIOUS\_FIX\_INTEREST\_AREA\_DWELL\_TIME"   
## [153] "PREVIOUS\_FIX\_INTEREST\_AREA\_FIX\_COUNT"   
## [154] "PREVIOUS\_FIX\_INTEREST\_AREA\_GROUP"   
## [155] "PREVIOUS\_FIX\_INTEREST\_AREA\_ID"   
## [156] "PREVIOUS\_FIX\_INTEREST\_AREA\_INDEX"   
## [157] "PREVIOUS\_FIX\_INTEREST\_AREA\_LABEL"   
## [158] "PREVIOUS\_FIX\_INTEREST\_AREA\_PIXEL\_AREA"   
## [159] "PREVIOUS\_FIX\_INTEREST\_AREA\_RUN\_ID"   
## [160] "PREVIOUS\_FIX\_IS\_RT\_END"   
## [161] "PREVIOUS\_FIX\_LABEL"   
## [162] "PREVIOUS\_FIX\_MSG\_COUNT"   
## [163] "PREVIOUS\_FIX\_MSG\_TEXT\_1"   
## [164] "PREVIOUS\_FIX\_MSG\_TIME\_1"   
## [165] "PREVIOUS\_FIX\_NEAREST\_INTEREST\_AREA"   
## [166] "PREVIOUS\_FIX\_NEAREST\_INTEREST\_AREA\_DISTANCE"   
## [167] "PREVIOUS\_FIX\_NEAREST\_INTEREST\_AREA\_LABEL"   
## [168] "PREVIOUS\_FIX\_PUPIL"   
## [169] "PREVIOUS\_FIX\_RUN\_DWELL\_TIME"   
## [170] "PREVIOUS\_FIX\_RUN\_INDEX"   
## [171] "PREVIOUS\_FIX\_RUN\_SIZE"   
## [172] "PREVIOUS\_FIX\_START"   
## [173] "PREVIOUS\_FIX\_START\_OTHER"   
## [174] "PREVIOUS\_FIX\_TRIAL\_SPAN"   
## [175] "PREVIOUS\_FIX\_X"   
## [176] "PREVIOUS\_FIX\_X\_OTHER"   
## [177] "PREVIOUS\_FIX\_X\_RESOLUTION"   
## [178] "PREVIOUS\_FIX\_Y"   
## [179] "PREVIOUS\_FIX\_Y\_OTHER"   
## [180] "PREVIOUS\_FIX\_Y\_RESOLUTION"   
## [181] "PREVIOUS\_SAC\_AMPLITUDE"   
## [182] "PREVIOUS\_SAC\_ANGLE"   
## [183] "PREVIOUS\_SAC\_AVG\_VELOCITY"   
## [184] "PREVIOUS\_SAC\_BLINK\_DURATION"   
## [185] "PREVIOUS\_SAC\_BLINK\_END"   
## [186] "PREVIOUS\_SAC\_BLINK\_START"   
## [187] "PREVIOUS\_SAC\_CONTAINS\_BLINK"   
## [188] "PREVIOUS\_SAC\_DIRECTION"   
## [189] "PREVIOUS\_SAC\_DURATION"   
## [190] "PREVIOUS\_SAC\_END\_INTEREST\_AREAS"   
## [191] "PREVIOUS\_SAC\_END\_INTEREST\_AREA\_ID"   
## [192] "PREVIOUS\_SAC\_END\_INTEREST\_AREA\_INDEX"   
## [193] "PREVIOUS\_SAC\_END\_INTEREST\_AREA\_LABEL"   
## [194] "PREVIOUS\_SAC\_END\_TIME"   
## [195] "PREVIOUS\_SAC\_END\_X"   
## [196] "PREVIOUS\_SAC\_END\_X\_RESOLUTION"   
## [197] "PREVIOUS\_SAC\_END\_Y"   
## [198] "PREVIOUS\_SAC\_END\_Y\_RESOLUTION"   
## [199] "PREVIOUS\_SAC\_INDEX"   
## [200] "PREVIOUS\_SAC\_INPUT\_EVENTS"   
## [201] "PREVIOUS\_SAC\_IS\_RT\_END"   
## [202] "PREVIOUS\_SAC\_LABEL"   
## [203] "PREVIOUS\_SAC\_MSG\_COUNT"   
## [204] "PREVIOUS\_SAC\_MSG\_TEXT\_1"   
## [205] "PREVIOUS\_SAC\_MSG\_TIME\_1"   
## [206] "PREVIOUS\_SAC\_NEAREST\_END\_INTEREST\_AREA"   
## [207] "PREVIOUS\_SAC\_NEAREST\_END\_INTEREST\_AREA\_LABEL"   
## [208] "PREVIOUS\_SAC\_NEAREST\_START\_INTEREST\_AREA"   
## [209] "PREVIOUS\_SAC\_NEAREST\_START\_INTEREST\_AREA\_LABEL"  
## [210] "PREVIOUS\_SAC\_PEAK\_VELOCITY"   
## [211] "PREVIOUS\_SAC\_START\_INTEREST\_AREAS"   
## [212] "PREVIOUS\_SAC\_START\_INTEREST\_AREA\_ID"   
## [213] "PREVIOUS\_SAC\_START\_INTEREST\_AREA\_INDEX"   
## [214] "PREVIOUS\_SAC\_START\_INTEREST\_AREA\_LABEL"   
## [215] "PREVIOUS\_SAC\_START\_TIME"   
## [216] "PREVIOUS\_SAC\_START\_X"   
## [217] "PREVIOUS\_SAC\_START\_X\_RESOLUTION"   
## [218] "PREVIOUS\_SAC\_START\_Y"   
## [219] "PREVIOUS\_SAC\_START\_Y\_RESOLUTION"   
## [220] "TRIAL\_FIXATION\_TOTAL"   
## [221] "TRIAL\_LABEL"   
## [222] "TRIAL\_START\_TIME"   
## [223] "VIDEO\_FRAME\_INDEX\_END"   
## [224] "VIDEO\_FRAME\_INDEX\_START"   
## [225] "VIDEO\_NAME\_END"   
## [226] "VIDEO\_NAME\_START"   
## [227] "aux\_type"   
## [228] "block\_description"   
## [229] "block\_order"   
## [230] "button\_RT"   
## [231] "button\_pressed"   
## [232] "cognate\_status"   
## [233] "critical\_region"   
## [234] "expected\_button\_press"   
## [235] "expected\_response"   
## [236] "file"   
## [237] "grammaticality"   
## [238] "practice"   
## [239] "question"   
## [240] "response\_accuracy"   
## [241] "sentence"   
## [242] "sentence\_type"   
## [243] "switch\_type"   
## [244] "GAZE\_DURATION"   
## [245] "REGRESSION\_PATH\_DURATION"   
## [246] "TOTAL\_DURATION"

levels(cs\_reading$sentence\_type)

## [1] "." "Experimental" "Filler" "Practice"   
## [5] "Practice Filler"

We have to identify the following columns for our new reduced dataset: \* RECORDING\_SESSION\_LABEL \* aux\_type \* switch\_type \* sentence\_type \* button\_RT \* response\_accuracy \* GAZE\_DURATION \* REGRESSION\_PATH\_DURATION \* TOTAL\_DURATION

We will use the select() command to narrow our dataset. This will be saved to a new dataset.

cs\_reading2 <- cs\_reading %>%   
 select(RECORDING\_SESSION\_LABEL, aux\_type, switch\_type, sentence\_type, button\_RT, response\_accuracy, GAZE\_DURATION, REGRESSION\_PATH\_DURATION, TOTAL\_DURATION)  
head(cs\_reading2)

## RECORDING\_SESSION\_LABEL aux\_type switch\_type sentence\_type button\_RT  
## 1 20 H <NA> Practice 2418  
## 2 20 H <NA> Practice 1367  
## 3 20 E <NA> Practice 869  
## 4 20 E <NA> Practice 1755  
## 5 20 E <NA> Practice 638  
## 6 20 E <NA> Practice Filler 818  
## response\_accuracy GAZE\_DURATION REGRESSION\_PATH\_DURATION TOTAL\_DURATION  
## 1 correct 0 0 0  
## 2 correct 0 0 0  
## 3 incorrect 0 0 0  
## 4 correct 209 2391 209  
## 5 correct 473 473 693  
## 6 incorrect 0 0 0

We noticed that for Windows machines, there was an issue with how the column header for the first column was encoded. This involved a weird character. One way to check this is to use the names() command which lists just the column names (check the first column header name for any weird character).

names(cs\_reading)

## [1] "RECORDING\_SESSION\_LABEL"   
## [2] "TRIAL\_INDEX"   
## [3] "CURRENT\_FIX\_ADJUSTED"   
## [4] "CURRENT\_FIX\_BLINK\_AROUND"   
## [5] "CURRENT\_FIX\_BUTTON\_0\_PRESS"   
## [6] "CURRENT\_FIX\_BUTTON\_1\_PRESS"   
## [7] "CURRENT\_FIX\_BUTTON\_2\_PRESS"   
## [8] "CURRENT\_FIX\_BUTTON\_3\_PRESS"   
## [9] "CURRENT\_FIX\_BUTTON\_4\_PRESS"   
## [10] "CURRENT\_FIX\_BUTTON\_5\_PRESS"   
## [11] "CURRENT\_FIX\_BUTTON\_6\_PRESS"   
## [12] "CURRENT\_FIX\_BUTTON\_7\_PRESS"   
## [13] "CURRENT\_FIX\_BUTTON\_8\_PRESS"   
## [14] "CURRENT\_FIX\_END"   
## [15] "CURRENT\_FIX\_END\_OTHER"   
## [16] "CURRENT\_FIX\_INPUT\_EVENTS"   
## [17] "CURRENT\_FIX\_INTEREST\_AREAS"   
## [18] "CURRENT\_FIX\_INTEREST\_AREA\_DATA"   
## [19] "CURRENT\_FIX\_INTEREST\_AREA\_DWELL\_TIME"   
## [20] "CURRENT\_FIX\_INTEREST\_AREA\_FIX\_COUNT"   
## [21] "CURRENT\_FIX\_INTEREST\_AREA\_GROUP"   
## [22] "CURRENT\_FIX\_INTEREST\_AREA\_ID"   
## [23] "CURRENT\_FIX\_INTEREST\_AREA\_LABEL"   
## [24] "CURRENT\_FIX\_INTEREST\_AREA\_PIXEL\_AREA"   
## [25] "CURRENT\_FIX\_INTEREST\_AREA\_RUN\_ID"   
## [26] "CURRENT\_FIX\_INTEREST\_AREA\_X\_OFFSET"   
## [27] "CURRENT\_FIX\_INTEREST\_AREA\_Y\_OFFSET"   
## [28] "CURRENT\_FIX\_IS\_RT\_END"   
## [29] "CURRENT\_FIX\_LABEL"   
## [30] "CURRENT\_FIX\_MSG\_COUNT"   
## [31] "CURRENT\_FIX\_MSG\_TEXT\_1"   
## [32] "CURRENT\_FIX\_MSG\_TIME\_1"   
## [33] "CURRENT\_FIX\_NEAREST\_INTEREST\_AREA"   
## [34] "CURRENT\_FIX\_NEAREST\_INTEREST\_AREA\_DISTANCE"   
## [35] "CURRENT\_FIX\_NEAREST\_INTEREST\_AREA\_LABEL"   
## [36] "CURRENT\_FIX\_PUPIL"   
## [37] "CURRENT\_FIX\_REFIX\_INTEREST\_AREA"   
## [38] "CURRENT\_FIX\_REFIX\_PREV\_INTEREST\_AREA"   
## [39] "CURRENT\_FIX\_RUN\_DWELL\_TIME"   
## [40] "CURRENT\_FIX\_RUN\_INDEX"   
## [41] "CURRENT\_FIX\_RUN\_SIZE"   
## [42] "CURRENT\_FIX\_START"   
## [43] "CURRENT\_FIX\_START\_OTHER"   
## [44] "CURRENT\_FIX\_TRIAL\_SPAN"   
## [45] "CURRENT\_FIX\_X"   
## [46] "CURRENT\_FIX\_X\_OTHER"   
## [47] "CURRENT\_FIX\_X\_RESOLUTION"   
## [48] "CURRENT\_FIX\_Y"   
## [49] "CURRENT\_FIX\_Y\_OTHER"   
## [50] "CURRENT\_FIX\_Y\_RESOLUTION"   
## [51] "DATA\_FILE"   
## [52] "EYE\_USED"   
## [53] "IP\_END\_EVENT\_MATCHED"   
## [54] "IP\_END\_TIME"   
## [55] "IP\_INDEX"   
## [56] "IP\_LABEL"   
## [57] "IP\_START\_EVENT\_MATCHED"   
## [58] "IP\_START\_TIME"   
## [59] "LAST\_BUTTON\_PRESSED"   
## [60] "LAST\_BUTTON\_PRESSED\_TIME"   
## [61] "LAST\_BUTTON\_RELEASED"   
## [62] "LAST\_BUTTON\_RELEASED\_TIME"   
## [63] "LAST\_BUTTON\_TIME"   
## [64] "NEXT\_FIX\_ANGLE"   
## [65] "NEXT\_FIX\_BLINK\_AROUND"   
## [66] "NEXT\_FIX\_DIRECTION"   
## [67] "NEXT\_FIX\_DISTANCE"   
## [68] "NEXT\_FIX\_DURATION"   
## [69] "NEXT\_FIX\_END"   
## [70] "NEXT\_FIX\_END\_OTHER"   
## [71] "NEXT\_FIX\_INPUT\_EVENTS"   
## [72] "NEXT\_FIX\_INTEREST\_AREAS"   
## [73] "NEXT\_FIX\_INTEREST\_AREA\_DATA"   
## [74] "NEXT\_FIX\_INTEREST\_AREA\_DWELL\_TIME"   
## [75] "NEXT\_FIX\_INTEREST\_AREA\_FIX\_COUNT"   
## [76] "NEXT\_FIX\_INTEREST\_AREA\_GROUP"   
## [77] "NEXT\_FIX\_INTEREST\_AREA\_ID"   
## [78] "NEXT\_FIX\_INTEREST\_AREA\_INDEX"   
## [79] "NEXT\_FIX\_INTEREST\_AREA\_LABEL"   
## [80] "NEXT\_FIX\_INTEREST\_AREA\_PIXEL\_AREA"   
## [81] "NEXT\_FIX\_INTEREST\_AREA\_RUN\_ID"   
## [82] "NEXT\_FIX\_IS\_RT\_END"   
## [83] "NEXT\_FIX\_LABEL"   
## [84] "NEXT\_FIX\_MSG\_COUNT"   
## [85] "NEXT\_FIX\_MSG\_TEXT\_1"   
## [86] "NEXT\_FIX\_MSG\_TIME\_1"   
## [87] "NEXT\_FIX\_NEAREST\_INTEREST\_AREA"   
## [88] "NEXT\_FIX\_NEAREST\_INTEREST\_AREA\_DISTANCE"   
## [89] "NEXT\_FIX\_NEAREST\_INTEREST\_AREA\_LABEL"   
## [90] "NEXT\_FIX\_PUPIL"   
## [91] "NEXT\_FIX\_RUN\_DWELL\_TIME"   
## [92] "NEXT\_FIX\_RUN\_INDEX"   
## [93] "NEXT\_FIX\_RUN\_SIZE"   
## [94] "NEXT\_FIX\_START"   
## [95] "NEXT\_FIX\_START\_OTHER"   
## [96] "NEXT\_FIX\_TRIAL\_SPAN"   
## [97] "NEXT\_FIX\_X"   
## [98] "NEXT\_FIX\_X\_OTHER"   
## [99] "NEXT\_FIX\_X\_RESOLUTION"   
## [100] "NEXT\_FIX\_Y"   
## [101] "NEXT\_FIX\_Y\_OTHER"   
## [102] "NEXT\_FIX\_Y\_RESOLUTION"   
## [103] "NEXT\_SAC\_AMPLITUDE"   
## [104] "NEXT\_SAC\_ANGLE"   
## [105] "NEXT\_SAC\_AVG\_VELOCITY"   
## [106] "NEXT\_SAC\_BLINK\_DURATION"   
## [107] "NEXT\_SAC\_BLINK\_END"   
## [108] "NEXT\_SAC\_BLINK\_START"   
## [109] "NEXT\_SAC\_CONTAINS\_BLINK"   
## [110] "NEXT\_SAC\_DIRECTION"   
## [111] "NEXT\_SAC\_DURATION"   
## [112] "NEXT\_SAC\_END\_INTEREST\_AREAS"   
## [113] "NEXT\_SAC\_END\_INTEREST\_AREA\_ID"   
## [114] "NEXT\_SAC\_END\_INTEREST\_AREA\_INDEX"   
## [115] "NEXT\_SAC\_END\_INTEREST\_AREA\_LABEL"   
## [116] "NEXT\_SAC\_END\_TIME"   
## [117] "NEXT\_SAC\_END\_X"   
## [118] "NEXT\_SAC\_END\_X\_RESOLUTION"   
## [119] "NEXT\_SAC\_END\_Y"   
## [120] "NEXT\_SAC\_END\_Y\_RESOLUTION"   
## [121] "NEXT\_SAC\_INDEX"   
## [122] "NEXT\_SAC\_INPUT\_EVENTS"   
## [123] "NEXT\_SAC\_IS\_RT\_END"   
## [124] "NEXT\_SAC\_LABEL"   
## [125] "NEXT\_SAC\_MSG\_COUNT"   
## [126] "NEXT\_SAC\_MSG\_TEXT\_1"   
## [127] "NEXT\_SAC\_MSG\_TIME\_1"   
## [128] "NEXT\_SAC\_NEAREST\_END\_INTEREST\_AREA"   
## [129] "NEXT\_SAC\_NEAREST\_END\_INTEREST\_AREA\_LABEL"   
## [130] "NEXT\_SAC\_NEAREST\_START\_INTEREST\_AREA"   
## [131] "NEXT\_SAC\_NEAREST\_START\_INTEREST\_AREA\_LABEL"   
## [132] "NEXT\_SAC\_PEAK\_VELOCITY"   
## [133] "NEXT\_SAC\_START\_INTEREST\_AREAS"   
## [134] "NEXT\_SAC\_START\_INTEREST\_AREA\_ID"   
## [135] "NEXT\_SAC\_START\_INTEREST\_AREA\_INDEX"   
## [136] "NEXT\_SAC\_START\_INTEREST\_AREA\_LABEL"   
## [137] "NEXT\_SAC\_START\_TIME"   
## [138] "NEXT\_SAC\_START\_X"   
## [139] "NEXT\_SAC\_START\_X\_RESOLUTION"   
## [140] "NEXT\_SAC\_START\_Y"   
## [141] "NEXT\_SAC\_START\_Y\_RESOLUTION"   
## [142] "PREVIOUS\_FIX\_ANGLE"   
## [143] "PREVIOUS\_FIX\_BLINK\_AROUND"   
## [144] "PREVIOUS\_FIX\_DIRECTION"   
## [145] "PREVIOUS\_FIX\_DISTANCE"   
## [146] "PREVIOUS\_FIX\_DURATION"   
## [147] "PREVIOUS\_FIX\_END"   
## [148] "PREVIOUS\_FIX\_END\_OTHER"   
## [149] "PREVIOUS\_FIX\_INPUT\_EVENTS"   
## [150] "PREVIOUS\_FIX\_INTEREST\_AREAS"   
## [151] "PREVIOUS\_FIX\_INTEREST\_AREA\_DATA"   
## [152] "PREVIOUS\_FIX\_INTEREST\_AREA\_DWELL\_TIME"   
## [153] "PREVIOUS\_FIX\_INTEREST\_AREA\_FIX\_COUNT"   
## [154] "PREVIOUS\_FIX\_INTEREST\_AREA\_GROUP"   
## [155] "PREVIOUS\_FIX\_INTEREST\_AREA\_ID"   
## [156] "PREVIOUS\_FIX\_INTEREST\_AREA\_INDEX"   
## [157] "PREVIOUS\_FIX\_INTEREST\_AREA\_LABEL"   
## [158] "PREVIOUS\_FIX\_INTEREST\_AREA\_PIXEL\_AREA"   
## [159] "PREVIOUS\_FIX\_INTEREST\_AREA\_RUN\_ID"   
## [160] "PREVIOUS\_FIX\_IS\_RT\_END"   
## [161] "PREVIOUS\_FIX\_LABEL"   
## [162] "PREVIOUS\_FIX\_MSG\_COUNT"   
## [163] "PREVIOUS\_FIX\_MSG\_TEXT\_1"   
## [164] "PREVIOUS\_FIX\_MSG\_TIME\_1"   
## [165] "PREVIOUS\_FIX\_NEAREST\_INTEREST\_AREA"   
## [166] "PREVIOUS\_FIX\_NEAREST\_INTEREST\_AREA\_DISTANCE"   
## [167] "PREVIOUS\_FIX\_NEAREST\_INTEREST\_AREA\_LABEL"   
## [168] "PREVIOUS\_FIX\_PUPIL"   
## [169] "PREVIOUS\_FIX\_RUN\_DWELL\_TIME"   
## [170] "PREVIOUS\_FIX\_RUN\_INDEX"   
## [171] "PREVIOUS\_FIX\_RUN\_SIZE"   
## [172] "PREVIOUS\_FIX\_START"   
## [173] "PREVIOUS\_FIX\_START\_OTHER"   
## [174] "PREVIOUS\_FIX\_TRIAL\_SPAN"   
## [175] "PREVIOUS\_FIX\_X"   
## [176] "PREVIOUS\_FIX\_X\_OTHER"   
## [177] "PREVIOUS\_FIX\_X\_RESOLUTION"   
## [178] "PREVIOUS\_FIX\_Y"   
## [179] "PREVIOUS\_FIX\_Y\_OTHER"   
## [180] "PREVIOUS\_FIX\_Y\_RESOLUTION"   
## [181] "PREVIOUS\_SAC\_AMPLITUDE"   
## [182] "PREVIOUS\_SAC\_ANGLE"   
## [183] "PREVIOUS\_SAC\_AVG\_VELOCITY"   
## [184] "PREVIOUS\_SAC\_BLINK\_DURATION"   
## [185] "PREVIOUS\_SAC\_BLINK\_END"   
## [186] "PREVIOUS\_SAC\_BLINK\_START"   
## [187] "PREVIOUS\_SAC\_CONTAINS\_BLINK"   
## [188] "PREVIOUS\_SAC\_DIRECTION"   
## [189] "PREVIOUS\_SAC\_DURATION"   
## [190] "PREVIOUS\_SAC\_END\_INTEREST\_AREAS"   
## [191] "PREVIOUS\_SAC\_END\_INTEREST\_AREA\_ID"   
## [192] "PREVIOUS\_SAC\_END\_INTEREST\_AREA\_INDEX"   
## [193] "PREVIOUS\_SAC\_END\_INTEREST\_AREA\_LABEL"   
## [194] "PREVIOUS\_SAC\_END\_TIME"   
## [195] "PREVIOUS\_SAC\_END\_X"   
## [196] "PREVIOUS\_SAC\_END\_X\_RESOLUTION"   
## [197] "PREVIOUS\_SAC\_END\_Y"   
## [198] "PREVIOUS\_SAC\_END\_Y\_RESOLUTION"   
## [199] "PREVIOUS\_SAC\_INDEX"   
## [200] "PREVIOUS\_SAC\_INPUT\_EVENTS"   
## [201] "PREVIOUS\_SAC\_IS\_RT\_END"   
## [202] "PREVIOUS\_SAC\_LABEL"   
## [203] "PREVIOUS\_SAC\_MSG\_COUNT"   
## [204] "PREVIOUS\_SAC\_MSG\_TEXT\_1"   
## [205] "PREVIOUS\_SAC\_MSG\_TIME\_1"   
## [206] "PREVIOUS\_SAC\_NEAREST\_END\_INTEREST\_AREA"   
## [207] "PREVIOUS\_SAC\_NEAREST\_END\_INTEREST\_AREA\_LABEL"   
## [208] "PREVIOUS\_SAC\_NEAREST\_START\_INTEREST\_AREA"   
## [209] "PREVIOUS\_SAC\_NEAREST\_START\_INTEREST\_AREA\_LABEL"  
## [210] "PREVIOUS\_SAC\_PEAK\_VELOCITY"   
## [211] "PREVIOUS\_SAC\_START\_INTEREST\_AREAS"   
## [212] "PREVIOUS\_SAC\_START\_INTEREST\_AREA\_ID"   
## [213] "PREVIOUS\_SAC\_START\_INTEREST\_AREA\_INDEX"   
## [214] "PREVIOUS\_SAC\_START\_INTEREST\_AREA\_LABEL"   
## [215] "PREVIOUS\_SAC\_START\_TIME"   
## [216] "PREVIOUS\_SAC\_START\_X"   
## [217] "PREVIOUS\_SAC\_START\_X\_RESOLUTION"   
## [218] "PREVIOUS\_SAC\_START\_Y"   
## [219] "PREVIOUS\_SAC\_START\_Y\_RESOLUTION"   
## [220] "TRIAL\_FIXATION\_TOTAL"   
## [221] "TRIAL\_LABEL"   
## [222] "TRIAL\_START\_TIME"   
## [223] "VIDEO\_FRAME\_INDEX\_END"   
## [224] "VIDEO\_FRAME\_INDEX\_START"   
## [225] "VIDEO\_NAME\_END"   
## [226] "VIDEO\_NAME\_START"   
## [227] "aux\_type"   
## [228] "block\_description"   
## [229] "block\_order"   
## [230] "button\_RT"   
## [231] "button\_pressed"   
## [232] "cognate\_status"   
## [233] "critical\_region"   
## [234] "expected\_button\_press"   
## [235] "expected\_response"   
## [236] "file"   
## [237] "grammaticality"   
## [238] "practice"   
## [239] "question"   
## [240] "response\_accuracy"   
## [241] "sentence"   
## [242] "sentence\_type"   
## [243] "switch\_type"   
## [244] "GAZE\_DURATION"   
## [245] "REGRESSION\_PATH\_DURATION"   
## [246] "TOTAL\_DURATION"

For Windows users, one quick solution is to manually rewrite the first column header. We can do this with the following code (the [1] means that we are rewriting the name of the first column header). This should then let one proceed with code as usual.

names(cs\_reading)[1] <- "RECORDING\_SESSION\_LABEL"  
head(cs\_reading)

## RECORDING\_SESSION\_LABEL TRIAL\_INDEX CURRENT\_FIX\_ADJUSTED  
## 1 20 1 FALSE  
## 2 20 2 FALSE  
## 3 20 3 FALSE  
## 4 20 4 FALSE  
## 5 20 5 FALSE  
## 6 20 7 FALSE  
## CURRENT\_FIX\_BLINK\_AROUND CURRENT\_FIX\_BUTTON\_0\_PRESS  
## 1 NONE .  
## 2 NONE .  
## 3 NONE .  
## 4 NONE .  
## 5 NONE .  
## 6 NONE .  
## CURRENT\_FIX\_BUTTON\_1\_PRESS CURRENT\_FIX\_BUTTON\_2\_PRESS  
## 1 . 8190  
## 2 6072 .  
## 3 . 7537  
## 4 . 8725  
## 5 5323 .  
## 6 4202 .  
## CURRENT\_FIX\_BUTTON\_3\_PRESS CURRENT\_FIX\_BUTTON\_4\_PRESS  
## 1 . .  
## 2 . .  
## 3 . .  
## 4 . .  
## 5 . .  
## 6 . .  
## CURRENT\_FIX\_BUTTON\_5\_PRESS CURRENT\_FIX\_BUTTON\_6\_PRESS  
## 1 . .  
## 2 . .  
## 3 . .  
## 4 . .  
## 5 . .  
## 6 . .  
## CURRENT\_FIX\_BUTTON\_7\_PRESS CURRENT\_FIX\_BUTTON\_8\_PRESS CURRENT\_FIX\_END  
## 1 . . 8223  
## 2 . . 6106  
## 3 . . 7569  
## 4 . . 8755  
## 5 . . 5354  
## 6 . . 4237  
## CURRENT\_FIX\_END\_OTHER CURRENT\_FIX\_INPUT\_EVENTS  
## 1 . [(8190,63)]  
## 2 . [(6072,95)]  
## 3 . [(7537,63)]  
## 4 . [(8725,63)]  
## 5 . [(5324,95)]  
## 6 . [(4202,95), (4203,127), (4203,95)]  
## CURRENT\_FIX\_INTEREST\_AREAS  
## 1 [ ]  
## 2 [ ]  
## 3 [ ]  
## 4 [ ]  
## 5 [ 8]  
## 6 [ ]  
## CURRENT\_FIX\_INTEREST\_AREA\_DATA  
## 1 .  
## 2 .  
## 3 .  
## 4 .  
## 5 [STATIC, RECTANGLE, 610.0, 496.0, 671.0, 579.0]  
## 6 .  
## CURRENT\_FIX\_INTEREST\_AREA\_DWELL\_TIME CURRENT\_FIX\_INTEREST\_AREA\_FIX\_COUNT  
## 1 . .  
## 2 . .  
## 3 . .  
## 4 . .  
## 5 693 2  
## 6 . .  
## CURRENT\_FIX\_INTEREST\_AREA\_GROUP CURRENT\_FIX\_INTEREST\_AREA\_ID  
## 1 . .  
## 2 . .  
## 3 . .  
## 4 . .  
## 5 . 8  
## 6 . .  
## CURRENT\_FIX\_INTEREST\_AREA\_LABEL CURRENT\_FIX\_INTEREST\_AREA\_PIXEL\_AREA  
## 1 . .  
## 2 . .  
## 3 . .  
## 4 . .  
## 5 que 5063  
## 6 . .  
## CURRENT\_FIX\_INTEREST\_AREA\_RUN\_ID CURRENT\_FIX\_INTEREST\_AREA\_X\_OFFSET  
## 1 . .  
## 2 . .  
## 3 . .  
## 4 . .  
## 5 2 -6.3  
## 6 . .  
## CURRENT\_FIX\_INTEREST\_AREA\_Y\_OFFSET CURRENT\_FIX\_IS\_RT\_END  
## 1 . FALSE  
## 2 . FALSE  
## 3 . FALSE  
## 4 . FALSE  
## 5 38.2 FALSE  
## 6 . FALSE  
## CURRENT\_FIX\_LABEL CURRENT\_FIX\_MSG\_COUNT CURRENT\_FIX\_MSG\_TEXT\_1  
## 1 Fixation: 6804 ms 1 subject\_response  
## 2 Fixation: 5701 ms 1 subject\_response  
## 3 Fixation: 7217 ms 1 subject\_response  
## 4 Fixation: 8225 ms 1 subject\_response  
## 5 Fixation: 5135 ms 1 subject\_response  
## 6 Fixation: 4044 ms 1 subject\_response  
## CURRENT\_FIX\_MSG\_TIME\_1 CURRENT\_FIX\_NEAREST\_INTEREST\_AREA  
## 1 8191 7  
## 2 6073 8  
## 3 7538 6  
## 4 8726 7  
## 5 5325 8  
## 6 4204 7  
## CURRENT\_FIX\_NEAREST\_INTEREST\_AREA\_DISTANCE  
## 1 0.82  
## 2 0.8  
## 3 0.9  
## 4 1.33  
## 5 0.63  
## 6 0.76  
## CURRENT\_FIX\_NEAREST\_INTEREST\_AREA\_LABEL CURRENT\_FIX\_PUPIL  
## 1 sopa 1209  
## 2 los 1094  
## 3 los 1015  
## 4 mientras 1053  
## 5 que 956  
## 6 the 1006  
## CURRENT\_FIX\_REFIX\_INTEREST\_AREA CURRENT\_FIX\_REFIX\_PREV\_INTEREST\_AREA  
## 1 . .  
## 2 . .  
## 3 . .  
## 4 . .  
## 5 8 1  
## 6 . .  
## CURRENT\_FIX\_RUN\_DWELL\_TIME CURRENT\_FIX\_RUN\_INDEX CURRENT\_FIX\_RUN\_SIZE  
## 1 . . .  
## 2 . . .  
## 3 . . .  
## 4 . . .  
## 5 220 1 1  
## 6 . . .  
## CURRENT\_FIX\_START CURRENT\_FIX\_START\_OTHER CURRENT\_FIX\_TRIAL\_SPAN  
## 1 6804 . SPAN\_NONE  
## 2 5701 . SPAN\_NONE  
## 3 7217 . SPAN\_NONE  
## 4 8225 . SPAN\_NONE  
## 5 5135 . SPAN\_NONE  
## 6 4044 . SPAN\_NONE  
## CURRENT\_FIX\_X CURRENT\_FIX\_X\_OTHER CURRENT\_FIX\_X\_RESOLUTION CURRENT\_FIX\_Y  
## 1 570.7 . 61.90 584.7  
## 2 576.8 . 61.85 586.3  
## 3 650.9 . 61.60 586.5  
## 4 662.4 . 61.60 593.2  
## 5 634.2 . 61.65 575.7  
## 6 615.8 . 61.70 579.6  
## CURRENT\_FIX\_Y\_OTHER CURRENT\_FIX\_Y\_RESOLUTION DATA\_FILE EYE\_USED  
## 1 . 61.1 20.edf RIGHT  
## 2 . 61.1 20.edf RIGHT  
## 3 . 61.0 20.edf RIGHT  
## 4 . 61.0 20.edf RIGHT  
## 5 . 61.0 20.edf RIGHT  
## 6 . 61.0 20.edf RIGHT  
## IP\_END\_EVENT\_MATCHED IP\_END\_TIME IP\_INDEX IP\_LABEL  
## 1 TRUE 276062 . Full Trial Period  
## 2 TRUE 284662 . Full Trial Period  
## 3 TRUE 293612 . Full Trial Period  
## 4 TRUE 304996 . Full Trial Period  
## 5 TRUE 311780 . Full Trial Period  
## 6 TRUE 324680 . Full Trial Period  
## IP\_START\_EVENT\_MATCHED IP\_START\_TIME LAST\_BUTTON\_PRESSED  
## 1 TRUE 267837 2  
## 2 TRUE 278554 1  
## 3 TRUE 286041 2  
## 4 TRUE 296239 2  
## 5 TRUE 306424 1  
## 6 TRUE 320441 1  
## LAST\_BUTTON\_PRESSED\_TIME LAST\_BUTTON\_RELEASED LAST\_BUTTON\_RELEASED\_TIME  
## 1 8190 1 5939  
## 2 6072 1 4824  
## 3 7537 1 6782  
## 4 8725 1 7110  
## 5 5323 1 4845  
## 6 4202 1 3522  
## LAST\_BUTTON\_TIME NEXT\_FIX\_ANGLE NEXT\_FIX\_BLINK\_AROUND NEXT\_FIX\_DIRECTION  
## 1 8190 . . .  
## 2 6072 . . .  
## 3 7537 . . .  
## 4 8725 . . .  
## 5 5323 . . .  
## 6 4202 . . .  
## NEXT\_FIX\_DISTANCE NEXT\_FIX\_DURATION NEXT\_FIX\_END NEXT\_FIX\_END\_OTHER  
## 1 . . . .  
## 2 . . . .  
## 3 . . . .  
## 4 . . . .  
## 5 . . . .  
## 6 . . . .  
## NEXT\_FIX\_INPUT\_EVENTS NEXT\_FIX\_INTEREST\_AREAS  
## 1 . .  
## 2 . .  
## 3 . .  
## 4 . .  
## 5 . .  
## 6 . .  
## NEXT\_FIX\_INTEREST\_AREA\_DATA NEXT\_FIX\_INTEREST\_AREA\_DWELL\_TIME  
## 1 . .  
## 2 . .  
## 3 . .  
## 4 . .  
## 5 . .  
## 6 . .  
## NEXT\_FIX\_INTEREST\_AREA\_FIX\_COUNT NEXT\_FIX\_INTEREST\_AREA\_GROUP  
## 1 . .  
## 2 . .  
## 3 . .  
## 4 . .  
## 5 . .  
## 6 . .  
## NEXT\_FIX\_INTEREST\_AREA\_ID NEXT\_FIX\_INTEREST\_AREA\_INDEX  
## 1 . .  
## 2 . .  
## 3 . .  
## 4 . .  
## 5 . .  
## 6 . .  
## NEXT\_FIX\_INTEREST\_AREA\_LABEL NEXT\_FIX\_INTEREST\_AREA\_PIXEL\_AREA  
## 1 . .  
## 2 . .  
## 3 . .  
## 4 . .  
## 5 . .  
## 6 . .  
## NEXT\_FIX\_INTEREST\_AREA\_RUN\_ID NEXT\_FIX\_IS\_RT\_END NEXT\_FIX\_LABEL  
## 1 . . .  
## 2 . . .  
## 3 . . .  
## 4 . . .  
## 5 . . .  
## 6 . . .  
## NEXT\_FIX\_MSG\_COUNT NEXT\_FIX\_MSG\_TEXT\_1 NEXT\_FIX\_MSG\_TIME\_1  
## 1 . . .  
## 2 . . .  
## 3 . . .  
## 4 . . .  
## 5 . . .  
## 6 . . .  
## NEXT\_FIX\_NEAREST\_INTEREST\_AREA NEXT\_FIX\_NEAREST\_INTEREST\_AREA\_DISTANCE  
## 1 . .  
## 2 . .  
## 3 . .  
## 4 . .  
## 5 . .  
## 6 . .  
## NEXT\_FIX\_NEAREST\_INTEREST\_AREA\_LABEL NEXT\_FIX\_PUPIL  
## 1 . .  
## 2 . .  
## 3 . .  
## 4 . .  
## 5 . .  
## 6 . .  
## NEXT\_FIX\_RUN\_DWELL\_TIME NEXT\_FIX\_RUN\_INDEX NEXT\_FIX\_RUN\_SIZE  
## 1 . . .  
## 2 . . .  
## 3 . . .  
## 4 . . .  
## 5 . . .  
## 6 . . .  
## NEXT\_FIX\_START NEXT\_FIX\_START\_OTHER NEXT\_FIX\_TRIAL\_SPAN NEXT\_FIX\_X  
## 1 . . . .  
## 2 . . . .  
## 3 . . . .  
## 4 . . . .  
## 5 . . . .  
## 6 . . . .  
## NEXT\_FIX\_X\_OTHER NEXT\_FIX\_X\_RESOLUTION NEXT\_FIX\_Y NEXT\_FIX\_Y\_OTHER  
## 1 . . . .  
## 2 . . . .  
## 3 . . . .  
## 4 . . . .  
## 5 . . . .  
## 6 . . . .  
## NEXT\_FIX\_Y\_RESOLUTION NEXT\_SAC\_AMPLITUDE NEXT\_SAC\_ANGLE  
## 1 . . .  
## 2 . . .  
## 3 . . .  
## 4 . . .  
## 5 . . .  
## 6 . . .  
## NEXT\_SAC\_AVG\_VELOCITY NEXT\_SAC\_BLINK\_DURATION NEXT\_SAC\_BLINK\_END  
## 1 . . .  
## 2 . . .  
## 3 . . .  
## 4 . . .  
## 5 . . .  
## 6 . . .  
## NEXT\_SAC\_BLINK\_START NEXT\_SAC\_CONTAINS\_BLINK NEXT\_SAC\_DIRECTION  
## 1 . . .  
## 2 . . .  
## 3 . . .  
## 4 . . .  
## 5 . . .  
## 6 . . .  
## NEXT\_SAC\_DURATION NEXT\_SAC\_END\_INTEREST\_AREAS  
## 1 . .  
## 2 . .  
## 3 . .  
## 4 . .  
## 5 . .  
## 6 . .  
## NEXT\_SAC\_END\_INTEREST\_AREA\_ID NEXT\_SAC\_END\_INTEREST\_AREA\_INDEX  
## 1 . .  
## 2 . .  
## 3 . .  
## 4 . .  
## 5 . .  
## 6 . .  
## NEXT\_SAC\_END\_INTEREST\_AREA\_LABEL NEXT\_SAC\_END\_TIME NEXT\_SAC\_END\_X  
## 1 . . .  
## 2 . . .  
## 3 . . .  
## 4 . . .  
## 5 . . .  
## 6 . . .  
## NEXT\_SAC\_END\_X\_RESOLUTION NEXT\_SAC\_END\_Y NEXT\_SAC\_END\_Y\_RESOLUTION  
## 1 . . .  
## 2 . . .  
## 3 . . .  
## 4 . . .  
## 5 . . .  
## 6 . . .  
## NEXT\_SAC\_INDEX NEXT\_SAC\_INPUT\_EVENTS NEXT\_SAC\_IS\_RT\_END NEXT\_SAC\_LABEL  
## 1 . . . .  
## 2 . . . .  
## 3 . . . .  
## 4 . . . .  
## 5 . . . .  
## 6 . . . .  
## NEXT\_SAC\_MSG\_COUNT NEXT\_SAC\_MSG\_TEXT\_1 NEXT\_SAC\_MSG\_TIME\_1  
## 1 . . .  
## 2 . . .  
## 3 . . .  
## 4 . . .  
## 5 . . .  
## 6 . . .  
## NEXT\_SAC\_NEAREST\_END\_INTEREST\_AREA  
## 1 .  
## 2 .  
## 3 .  
## 4 .  
## 5 .  
## 6 .  
## NEXT\_SAC\_NEAREST\_END\_INTEREST\_AREA\_LABEL  
## 1 .  
## 2 .  
## 3 .  
## 4 .  
## 5 .  
## 6 .  
## NEXT\_SAC\_NEAREST\_START\_INTEREST\_AREA  
## 1 .  
## 2 .  
## 3 .  
## 4 .  
## 5 .  
## 6 .  
## NEXT\_SAC\_NEAREST\_START\_INTEREST\_AREA\_LABEL NEXT\_SAC\_PEAK\_VELOCITY  
## 1 . .  
## 2 . .  
## 3 . .  
## 4 . .  
## 5 . .  
## 6 . .  
## NEXT\_SAC\_START\_INTEREST\_AREAS NEXT\_SAC\_START\_INTEREST\_AREA\_ID  
## 1 . .  
## 2 . .  
## 3 . .  
## 4 . .  
## 5 . .  
## 6 . .  
## NEXT\_SAC\_START\_INTEREST\_AREA\_INDEX NEXT\_SAC\_START\_INTEREST\_AREA\_LABEL  
## 1 . .  
## 2 . .  
## 3 . .  
## 4 . .  
## 5 . .  
## 6 . .  
## NEXT\_SAC\_START\_TIME NEXT\_SAC\_START\_X NEXT\_SAC\_START\_X\_RESOLUTION  
## 1 . . .  
## 2 . . .  
## 3 . . .  
## 4 . . .  
## 5 . . .  
## 6 . . .  
## NEXT\_SAC\_START\_Y NEXT\_SAC\_START\_Y\_RESOLUTION PREVIOUS\_FIX\_ANGLE  
## 1 . . 2.76  
## 2 . . 175.58  
## 3 . . -176.07  
## 4 . . 173.32  
## 5 . . 171.65  
## 6 . . -179.42  
## PREVIOUS\_FIX\_BLINK\_AROUND PREVIOUS\_FIX\_DIRECTION PREVIOUS\_FIX\_DISTANCE  
## 1 NONE RIGHT 0.58  
## 2 NONE LEFT 2.98  
## 3 NONE LEFT 2.27  
## 4 NONE LEFT 0.61  
## 5 NONE LEFT 2.67  
## 6 NONE LEFT 1.45  
## PREVIOUS\_FIX\_DURATION PREVIOUS\_FIX\_END PREVIOUS\_FIX\_END\_OTHER  
## 1 503 6795 .  
## 2 232 5664 .  
## 3 302 7188 .  
## 4 757 8210 .  
## 5 192 5103 .  
## 6 366 4021 .  
## PREVIOUS\_FIX\_INPUT\_EVENTS PREVIOUS\_FIX\_INTEREST\_AREAS  
## 1 [] [ ]  
## 2 [] [ 5]  
## 3 [] [ ]  
## 4 [] [ ]  
## 5 [] [ 6]  
## 6 [] [ ]  
## PREVIOUS\_FIX\_INTEREST\_AREA\_DATA  
## 1 .  
## 2 [STATIC, RECTANGLE, 296.0, 496.0, 416.0, 579.0]  
## 3 .  
## 4 .  
## 5 [STATIC, RECTANGLE, 431.0, 496.0, 475.0, 579.0]  
## 6 .  
## PREVIOUS\_FIX\_INTEREST\_AREA\_DWELL\_TIME  
## 1 .  
## 2 412  
## 3 .  
## 4 .  
## 5 192  
## 6 .  
## PREVIOUS\_FIX\_INTEREST\_AREA\_FIX\_COUNT PREVIOUS\_FIX\_INTEREST\_AREA\_GROUP  
## 1 . .  
## 2 2 .  
## 3 . .  
## 4 . .  
## 5 1 .  
## 6 . .  
## PREVIOUS\_FIX\_INTEREST\_AREA\_ID PREVIOUS\_FIX\_INTEREST\_AREA\_INDEX  
## 1 . .  
## 2 5 5  
## 3 . .  
## 4 . .  
## 5 6 6  
## 6 . .  
## PREVIOUS\_FIX\_INTEREST\_AREA\_LABEL PREVIOUS\_FIX\_INTEREST\_AREA\_PIXEL\_AREA  
## 1 . .  
## 2 escuela 9960  
## 3 . .  
## 4 . .  
## 5 al 3652  
## 6 . .  
## PREVIOUS\_FIX\_INTEREST\_AREA\_RUN\_ID PREVIOUS\_FIX\_IS\_RT\_END  
## 1 . FALSE  
## 2 2 FALSE  
## 3 . FALSE  
## 4 . FALSE  
## 5 1 FALSE  
## 6 . FALSE  
## PREVIOUS\_FIX\_LABEL PREVIOUS\_FIX\_MSG\_COUNT PREVIOUS\_FIX\_MSG\_TEXT\_1  
## 1 Fixation: 6293 ms 0 .  
## 2 Fixation: 5433 ms 0 .  
## 3 Fixation: 6887 ms 0 .  
## 4 Fixation: 7454 ms 0 .  
## 5 Fixation: 4912 ms 0 .  
## 6 Fixation: 3656 ms 0 .  
## PREVIOUS\_FIX\_MSG\_TIME\_1 PREVIOUS\_FIX\_NEAREST\_INTEREST\_AREA  
## 1 . 7  
## 2 . 5  
## 3 . 4  
## 4 . 6  
## 5 . 6  
## 6 . 6  
## PREVIOUS\_FIX\_NEAREST\_INTEREST\_AREA\_DISTANCE  
## 1 0.8  
## 2 0.8  
## 3 1.17  
## 4 1.19  
## 5 0.37  
## 6 0.91  
## PREVIOUS\_FIX\_NEAREST\_INTEREST\_AREA\_LABEL PREVIOUS\_FIX\_PUPIL  
## 1 sopa 1122  
## 2 escuela 1056  
## 3 cuestionando 946  
## 4 documentos 1043  
## 5 al 867  
## 6 comprando 992  
## PREVIOUS\_FIX\_RUN\_DWELL\_TIME PREVIOUS\_FIX\_RUN\_INDEX PREVIOUS\_FIX\_RUN\_SIZE  
## 1 . . .  
## 2 232 1 1  
## 3 . . .  
## 4 . . .  
## 5 192 1 1  
## 6 . . .  
## PREVIOUS\_FIX\_START PREVIOUS\_FIX\_START\_OTHER PREVIOUS\_FIX\_TRIAL\_SPAN  
## 1 6293 . SPAN\_NONE  
## 2 5433 . SPAN\_NONE  
## 3 6887 . SPAN\_NONE  
## 4 7454 . SPAN\_NONE  
## 5 4912 . SPAN\_NONE  
## 6 3656 . SPAN\_NONE  
## PREVIOUS\_FIX\_X PREVIOUS\_FIX\_X\_OTHER PREVIOUS\_FIX\_X\_RESOLUTION  
## 1 606.4 . 61.75  
## 2 391.4 . 62.80  
## 3 510.8 . 62.20  
## 4 625.3 . 61.70  
## 5 470.5 . 62.35  
## 6 526.3 . 62.05  
## PREVIOUS\_FIX\_Y PREVIOUS\_FIX\_Y\_OTHER PREVIOUS\_FIX\_Y\_RESOLUTION  
## 1 583.0 . 61.05  
## 2 572.2 . 61.55  
## 3 596.0 . 61.30  
## 4 588.9 . 61.00  
## 5 552.0 . 61.35  
## 6 580.5 . 61.20  
## PREVIOUS\_SAC\_AMPLITUDE PREVIOUS\_SAC\_ANGLE PREVIOUS\_SAC\_AVG\_VELOCITY  
## 1 0.32 -179.12 39.82  
## 2 3.20 -1.34 88.84  
## 3 2.57 7.21 91.71  
## 4 0.66 8.16 47.05  
## 5 2.88 -4.69 92.89  
## 6 1.38 5.17 62.77  
## PREVIOUS\_SAC\_BLINK\_DURATION PREVIOUS\_SAC\_BLINK\_END  
## 1 . .  
## 2 . .  
## 3 . .  
## 4 . .  
## 5 . .  
## 6 . .  
## PREVIOUS\_SAC\_BLINK\_START PREVIOUS\_SAC\_CONTAINS\_BLINK  
## 1 . FALSE  
## 2 . FALSE  
## 3 . FALSE  
## 4 . FALSE  
## 5 . FALSE  
## 6 . FALSE  
## PREVIOUS\_SAC\_DIRECTION PREVIOUS\_SAC\_DURATION  
## 1 . 8  
## 2 RIGHT 36  
## 3 RIGHT 28  
## 4 RIGHT 14  
## 5 RIGHT 31  
## 6 RIGHT 22  
## PREVIOUS\_SAC\_END\_INTEREST\_AREAS PREVIOUS\_SAC\_END\_INTEREST\_AREA\_ID  
## 1 [ ] .  
## 2 [ ] .  
## 3 [ 7] 7  
## 4 [ ] .  
## 5 [ 8] 8  
## 6 [ 7] 7  
## PREVIOUS\_SAC\_END\_INTEREST\_AREA\_INDEX  
## 1 .  
## 2 .  
## 3 7  
## 4 .  
## 5 8  
## 6 7  
## PREVIOUS\_SAC\_END\_INTEREST\_AREA\_LABEL PREVIOUS\_SAC\_END\_TIME  
## 1 . 6803  
## 2 . 5700  
## 3 sospechosos 7216  
## 4 . 8224  
## 5 que 5134  
## 6 the 4043  
## PREVIOUS\_SAC\_END\_X PREVIOUS\_SAC\_END\_X\_RESOLUTION PREVIOUS\_SAC\_END\_Y  
## 1 576.6 61.9 584.2  
## 2 588.6 61.8 579.3  
## 3 665.9 61.6 577.9  
## 4 665.8 61.6 587.0  
## 5 648.8 61.6 570.7  
## 6 612.0 61.8 577.1  
## PREVIOUS\_SAC\_END\_Y\_RESOLUTION PREVIOUS\_SAC\_INDEX  
## 1 61.1 20  
## 2 61.1 19  
## 3 61.0 23  
## 4 61.0 24  
## 5 61.0 16  
## 6 61.0 14  
## PREVIOUS\_SAC\_INPUT\_EVENTS PREVIOUS\_SAC\_IS\_RT\_END PREVIOUS\_SAC\_LABEL  
## 1 [] FALSE Saccade: 6796 ms  
## 2 [] FALSE Saccade: 5665 ms  
## 3 [] FALSE Saccade: 7189 ms  
## 4 [] FALSE Saccade: 8211 ms  
## 5 [] FALSE Saccade: 5104 ms  
## 6 [] FALSE Saccade: 4022 ms  
## PREVIOUS\_SAC\_MSG\_COUNT PREVIOUS\_SAC\_MSG\_TEXT\_1 PREVIOUS\_SAC\_MSG\_TIME\_1  
## 1 0 . .  
## 2 0 . .  
## 3 0 . .  
## 4 0 . .  
## 5 0 . .  
## 6 0 . .  
## PREVIOUS\_SAC\_NEAREST\_END\_INTEREST\_AREA  
## 1 7  
## 2 8  
## 3 7  
## 4 7  
## 5 8  
## 6 7  
## PREVIOUS\_SAC\_NEAREST\_END\_INTEREST\_AREA\_LABEL  
## 1 sopa  
## 2 los  
## 3 sospechosos  
## 4 mientras  
## 5 que  
## 6 the  
## PREVIOUS\_SAC\_NEAREST\_START\_INTEREST\_AREA  
## 1 7  
## 2 5  
## 3 4  
## 4 6  
## 5 6  
## 6 6  
## PREVIOUS\_SAC\_NEAREST\_START\_INTEREST\_AREA\_LABEL  
## 1 sopa  
## 2 escuela  
## 3 cuestionando  
## 4 documentos  
## 5 al  
## 6 comprando  
## PREVIOUS\_SAC\_PEAK\_VELOCITY PREVIOUS\_SAC\_START\_INTEREST\_AREAS  
## 1 37.24 [ ]  
## 2 128.90 [ 5]  
## 3 150.19 [ ]  
## 4 50.63 [ ]  
## 5 147.77 [ 6]  
## 6 75.60 [ ]  
## PREVIOUS\_SAC\_START\_INTEREST\_AREA\_ID  
## 1 .  
## 2 5  
## 3 .  
## 4 .  
## 5 6  
## 6 .  
## PREVIOUS\_SAC\_START\_INTEREST\_AREA\_INDEX  
## 1 .  
## 2 5  
## 3 .  
## 4 .  
## 5 6  
## 6 .  
## PREVIOUS\_SAC\_START\_INTEREST\_AREA\_LABEL PREVIOUS\_SAC\_START\_TIME  
## 1 . 6796  
## 2 escuela 5665  
## 3 . 7189  
## 4 . 8211  
## 5 al 5104  
## 6 . 4022  
## PREVIOUS\_SAC\_START\_X PREVIOUS\_SAC\_START\_X\_RESOLUTION  
## 1 596.3 61.8  
## 2 389.4 62.8  
## 3 508.2 62.2  
## 4 625.6 61.7  
## 5 471.0 62.3  
## 6 526.8 62.1  
## PREVIOUS\_SAC\_START\_Y PREVIOUS\_SAC\_START\_Y\_RESOLUTION  
## 1 583.9 61.1  
## 2 574.7 61.5  
## 3 597.6 61.3  
## 4 592.7 61.0  
## 5 556.3 61.3  
## 6 584.7 61.2  
## TRIAL\_FIXATION\_TOTAL TRIAL\_LABEL TRIAL\_START\_TIME VIDEO\_FRAME\_INDEX\_END  
## 1 21 Trial: 1 267837 .  
## 2 20 Trial: 2 278554 .  
## 3 24 Trial: 3 286041 .  
## 4 25 Trial: 4 296239 .  
## 5 17 Trial: 5 306424 .  
## 6 15 Trial: 7 320441 .  
## VIDEO\_FRAME\_INDEX\_START VIDEO\_NAME\_END VIDEO\_NAME\_START aux\_type  
## 1 . . . H  
## 2 . . . H  
## 3 . . . E  
## 4 . . . E  
## 5 . . . E  
## 6 . . . E  
## block\_description block\_order button\_RT button\_pressed cognate\_status  
## 1 Practice 1 2418 2 <NA>  
## 2 Practice 1 1367 1 <NA>  
## 3 Practice 1 869 2 <NA>  
## 4 Practice 1 1755 2 <NA>  
## 5 Practice 1 638 1 <NA>  
## 6 Experimental 2 818 1 <NA>  
## critical\_region expected\_button\_press expected\_response  
## 1 <NA> 2 no  
## 2 <NA> 1 yes  
## 3 <NA> 1 yes  
## 4 <NA> 2 no  
## 5 <NA> 1 yes  
## 6 <NA> 2 no  
## file grammaticality practice  
## 1 File 4 Grammaticality A 1  
## 2 File 4 Grammaticality G 1  
## 3 File 4 Grammaticality G 1  
## 4 File 4 Grammaticality A 1  
## 5 File 4 Grammaticality G 1  
## 6 File 4 Grammaticality A 2  
## question response\_accuracy  
## 1 Is the sentence grammatical? correct  
## 2 Is the sentence grammatical? correct  
## 3 Is the sentence grammatical? incorrect  
## 4 Is the sentence grammatical? correct  
## 5 Is the sentence grammatical? correct  
## 6 Is the sentence grammatical? incorrect  
## sentence  
## 1 Sandra y Miriam había preparado la sopa de vegetales before their roommate arrived.  
## 2 El director de la escuela notó que los estudiantes had broken the bookshelf in the library.  
## 3 El investigador estará cuestionando a los sospechosos about the events leading to the crime.  
## 4 El abogado estaba revisando el documentos mientras his assistant answered phone calls.  
## 5 El doctor le está diciendo al paciente que he should stay in bed for another week.  
## 6 Lidia y sus amiga estaban comprando the books for the chemistry class.  
## sentence\_type switch\_type GAZE\_DURATION REGRESSION\_PATH\_DURATION  
## 1 Practice <NA> 0 0  
## 2 Practice <NA> 0 0  
## 3 Practice <NA> 0 0  
## 4 Practice <NA> 209 2391  
## 5 Practice <NA> 473 473  
## 6 Practice Filler <NA> 0 0  
## TOTAL\_DURATION  
## 1 0  
## 2 0  
## 3 0  
## 4 209  
## 5 693  
## 6 0

We only want experimental sentences. We will use filter() to select just experimental sentences.

cs\_reading3 <- cs\_reading2 %>%   
 filter(sentence\_type == "Experimental" & response\_accuracy == "correct")  
head(cs\_reading3)

## RECORDING\_SESSION\_LABEL aux\_type switch\_type sentence\_type button\_RT  
## 1 20 E At\_Aux Experimental 465  
## 2 20 E At\_Aux Experimental 815  
## 3 20 E At\_Aux Experimental -3  
## 4 20 E At\_Verb Experimental 613  
## 5 20 H At\_Aux Experimental 905  
## 6 20 E At\_Aux Experimental 480  
## response\_accuracy GAZE\_DURATION REGRESSION\_PATH\_DURATION TOTAL\_DURATION  
## 1 correct 0 0 0  
## 2 correct 177 177 177  
## 3 correct 0 0 222  
## 4 correct 0 0 0  
## 5 correct 0 0 0  
## 6 correct 344 344 777

Now we are going to summarize the data by the variables of interest, aux\_type and switch\_type.

cs\_summary <- cs\_reading3 %>%   
 group\_by(aux\_type, switch\_type) %>%   
 summarize(mGAZE\_DURATION = mean(GAZE\_DURATION), mREGRESSION\_PATH\_DURATION = mean(REGRESSION\_PATH\_DURATION), mTOTAL\_DURATION = mean(TOTAL\_DURATION), sdGAZE\_DURATION = sd(GAZE\_DURATION), sdREGRESSION\_PATH\_DURATION = sd(REGRESSION\_PATH\_DURATION), sdTOTAL\_DURATION = sd(TOTAL\_DURATION))  
cs\_summary

## # A tibble: 4 x 8  
## # Groups: aux\_type [?]  
## aux\_type switch\_type mGAZE\_DURATION mREGRESSION\_PATH\_DU… mTOTAL\_DURATION  
## <fct> <fct> <dbl> <dbl> <dbl>  
## 1 E At\_Aux 176. 383. 683.  
## 2 E At\_Verb 271. 536. 797.  
## 3 H At\_Aux 169. 363. 578   
## 4 H At\_Verb 246. 442. 922.  
## # ... with 3 more variables: sdGAZE\_DURATION <dbl>,  
## # sdREGRESSION\_PATH\_DURATION <dbl>, sdTOTAL\_DURATION <dbl>

We also collected button RT from the amount of time it took to answer the comprehension question. Now we will summarize and get the mean and sd of button\_RT. We noticed in class that for some of us, the button\_RT was not summarizing with mean. It turns out that the variable was considered a factor (instead of an integer), so we first had to change the class to an integer class using as.integer().

cs\_reading3$button\_RT <- as.integer(cs\_reading3$button\_RT)  
  
buttonrt\_summary <- cs\_reading3 %>%   
 group\_by(aux\_type, switch\_type) %>%   
 summarize(mbuttonRT = mean(button\_RT), sdbuttonRT = sd(button\_RT))  
buttonrt\_summary

## # A tibble: 4 x 4  
## # Groups: aux\_type [?]  
## aux\_type switch\_type mbuttonRT sdbuttonRT  
## <fct> <fct> <dbl> <dbl>  
## 1 E At\_Aux 316. 174.  
## 2 E At\_Verb 284. 163.  
## 3 H At\_Aux 302. 167.  
## 4 H At\_Verb 234. 141.

let’s graph mean button press RTs very quickly.

ggplot(buttonrt\_summary, aes(aux\_type, mbuttonRT, fill = switch\_type)) +  
 geom\_bar(stat = "identity", position = "dodge")

