Reproducible analysis reports with eye-tracking reading time data

SoSe2023

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Welcome!

- the language of instruction is English
- Block course:
  - April 12-14 (10am-4pm)
  - June 30th (2-6pm)
  - July 1st (10am-4pm)

Course Moodle

Course name: Reproducible analysis reports with eye-tracking reading time data (Blockseminar) Enrolment Key: Rmatey

Most documents are available as slides, html, and PDF. Choose whichever you prefer (I suggest html).

Course description

- develop skills and know-how
  - create reproducible **reports & presentations** of eye-tracking reading data
  - common measures in **eye-tracking reading**
  - importance of **reproducible workflow**
  - **communicate** findings
- hands-on exercises in RStudio with the R programming language
  - data **wrangling** (`tidyverse`)
  - data **visualisation** (`ggplot2`),
  - descriptive and inferential **statistics** (`lme4` and `lmerTest`)

Course credits

- 4 LP
  - attendance and participation: 1LP
  - In-class exercises and preparation: 1LP
  - Assignments: 2 LP
    1. Reproducible (pilot) analysis report + Pre-registration
    2. Reproducible analysis report

Reading list

- this course does not have a heavy reading load, but a few readings are strongly recommended:
  - Open Science: Kathawalla et al. (2021)
  - Eye-tracking reading: Clifton et al. (2007); Vasishth et al. (2013);
  - A short recommendation for statistics for psycholinguists: Vasishth & Nicenboim (2016)
  - Statistics for Linguistics (textbook): Winter (2019) (E-book available via Grimm)

Further readings

- there are lots of useful resources out there, specifically:
  - Bodo Winter's tutorials on linear (mixed) models (Winter, 2013, 2014)
  - the PsyTeachR website is a *great* resource for hands-on stats and/or data analysis in R from the University of Glasgow School of Psychology and Neuroscience

Session Info

Save your session info at the end of each document. Our results very often depend on the version of R/RStudio/a package we used. This is a great first step towards creating a reproducible workflow!

```
R version 4.2.3 (2023-03-15)
Platform: aarch64-apple-darwin20 (64-bit)
Running under: macOS Ventura 13.2.1

Matrix products: default
BLAS:   /Library/Frameworks/R.framework/Versions/4.2-arm64/Resources/lib/libRblas.0.dylib
LAPACK: /Library/Frameworks/R.framework/Versions/4.2-arm64/Resources/lib/libRlapack.dylib

locale:
[1] en_US.UTF-8/en_US.UTF-8/en_US.UTF-8/C/en_US.UTF-8/en_US.UTF-8

attached base packages:
[1] stats     graphics  grDevices utils     datasets  methods   base

loaded via a namespace (and not attached):
 [1] rstudioapi_0.14 knitr_1.42      magrittr_2.0.3  hms_1.1.3
 [5] R6_2.5.1        rlang_1.1.0     fastmap_1.1.1   fansi_1.0.4
 [9] httr_1.4.5      stringr_1.5.0   tools_4.2.3     xfun_0.38
[13] utf8_1.2.3      cli_3.6.1       htmltools_0.5.5 yaml_2.3.7
[17] digest_0.6.31   tibble_3.2.1    lifecycle_1.0.3 readr_2.1.4
[21] tzdb_0.3.0      fs_1.6.1        vctrs_0.6.1     curl_5.0.0
[25] glue_1.6.2      evaluate_0.20   rmarkdown_2.21  stringi_1.7.12
[29] compiler_4.2.3  pillar_1.9.0    rbbt_0.0.0.9000 jsonlite_1.8.4
[33] pkgconfig_2.0.3
```

References

Clifton, C., Staub, A., & Rayner, K. (2007). Eye movements in reading words and sentences. *Eye Movements*, 341–371. https://doi.org/10.1016/B978-008044980-7/50017-3

Kathawalla, U.-K., Silverstein, P., & Syed, M. (2021). Easing Into Open Science: A Guide for Graduate Students and Their Advisors. *Collabra: Psychology*, *7*(1), 18684. https://doi.org/10.1525/collabra.18684

Vasishth, S., & Nicenboim, B. (2016). Statistical methods for linguistic research: Foundational Ideas—Part I. *Language and Linguistics Compass*, *10*(11), 591–613. https://doi.org/10.1111/lnc3.12207

Vasishth, S., von der Malsburg, T., & Engelmann, F. (2013). What eye movements can tell us about sentence comprehension. *Wiley Interdisciplinary Reviews: Cognitive Science*, *4*(2), 125–134. https://doi.org/10.1002/wcs.1209

Winter, B. (2013). *Linear models and linear mixed effects models in R: Tutorial 1.* https://bodowinter.com/tutorial/bw_LME_tutorial1.pdf

Winter, B. (2014). *A very basic tutorial for performing linear mixed effects analyses (Tutorial 2).* https://bodowinter.com/tutorial/bw_LME_tutorial2.pdf

Winter, B. (2019). *Statistics for Linguists: An Introduction Using R.* Routledge. https://doi.org/10.4324/9781315165547