F05_mci_emotion_tables.R

2020-09-22

```r
## MCI EMO TABLES SCRIPT ##

# Creates a table for the output of our four linear mixed-effects models. The upper half of the table includes ANOVA-
# style type III tests (F-tests), the bottom half contains planned follow-up contrasts. For the F-tests, F-values,
# degrees of freedom, and p-values are printed, whereas for the contrasts, regression estimates, 95% confidence
# intervals, and p-values are printed.

## PREPARATION ## ---------------------------------------------------------------------------------------

# Load packages
library(Rmisc)        # Version 1.5
library(tidyverse)    # Version 1.3.0
library(magrittr)     # Version 1.5
library(officer)      # Version 0.3.14
library(flextable)    # Version 0.5.11
library(huxtable)     # version 5.0.0

## TABLE 2: MEAN RATINGS ## -----------------------------------------------------------------------------

# Load single-trial data
a1 <- readRDS("EEG/export/a1.RDS")

# Remove trials with errors or invalid RTs/ERPs
a1 %<>% filter(!error) %>% na.omit()

# Adjust range of response scales
a1$Valence <- a1$ValenzResp + 3
a1$Arousal <- a1$ArousalResp + 3
```

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# Compute mean ratings
tab2 <- summarySEwithin(a1, measurevar = "Valence", withinvars = "context") %>%
  select(m_val = Valence, sd_val = sd) %>%
  bind_cols(summarySEwithin(a1, measurevar = "Arousal", withinvars = "context") %>%
              select(m_aro = Arousal, sd_aro = sd)) %>%
  set_rownames(c("Neutral", "Negative")) %>%
  huxtable(add_rownames = "", add_colnames = FALSE) %>%
  add_rows(c("Context", "M", "SD", "M", "SD"), after = 0) %>%
  add_rows(c("", "Valence Rating", "", "Arousal Rating", ""), after = 0)

# Output as markdown for GitHub
suppressWarnings(print_md(tab2, max_width = Inf))
```

	Valence Rating		Arousal Rating	
Context	M	SD	M	SD
Neutral	3.24	1.18	2.37	1.52
Negative	1.82	1.21	3.42	1.61

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# Save as Word document
tab2 %>% quick_docx(file = "EEG/tables/table_2.docx", open = FALSE)

## TABLE 3: LMMS FOR N400 ## ------------------------------------------------------------------------------

# Load output of linear mixed-effects models
load("EEG/export/stats.RData")
```

```
## Registered S3 methods overwritten by 'car':
##   method                          from
##   influence.merMod                lme4
##   cooks.distance.influence.merMod lme4
##   dfbeta.influence.merMod         lme4
##   dfbetas.influence.merMod        lme4
```

```r
# Extract a table for the F tests for each model (columns: F value (df), p-value)
anovas_tab3 <- map(tests[c("N400_VERB", "N400_PICT")], function(x){
  coefs <- data.frame(paste0(format(round(x$`F value`, 2), trim = TRUE, nsmall = 2),
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                             "<br/> (", x$NumDF, ", ", format(round(x$DenDF, 1), trim = TRUE, nsmall = 1), ")"),
                      format(round(x$`Pr(>F)`, 3), nsmall = 3),
                      fix.empty.names = FALSE)
  coefs[,2] <- substr(coefs[,2], 1, 5)
  coefs[coefs[,2] == "0.000", 2] <- "< .001"
  return(coefs)
})


# Bind all the F-tests to one data frame
anovas_tab3 <- do.call(cbind, anovas_tab3)
anovas_tab3 <- rbind(c("**_F_** (**_df_**)", "**_p_**"), anovas_tab3)


# Extract a table for the planned contrasts for each model (columns: estimate [CI], p-value)
conts_tab3 <- map(means_nested[c("N400_VERB", "N400_PICT")], function(x){
  x <- as.data.frame(x)
  coefs <- data.frame(paste0(format(round(x$estimate, 2), trim = TRUE, nsmall = 2),
                          "<br/> [", format(round(x$lower.CL, 2), trim = TRUE, nsmall = 2), ", ",
                          format(round(x$upper.CL, 2), trim = TRUE, nsmall = 2), "]"),
                      format(round(x$p.value, 3), nsmall = 3),
                      fix.empty.names = FALSE)
  coefs[,2] <- substr(coefs[,2], 1, 5)
  coefs[coefs[,2] == "0.000", 2] <- "< .001"
  return(coefs)
})


# Bind all the planned contrasts to one data frame
conts_tab3 <- do.call(cbind, conts_tab3)
conts_tab3 <- rbind(c("**Est. [95% CI]**", "**_p_**"), conts_tab3)

# Bind both data frames (F-tests and contrats) below one another
tab3 <- rbind(anovas_tab3, conts_tab3)

# Add model names (dependent variables) as the first row
tab3 <- rbind(c("Verb-Related N400", "", "Picture-Related N400", ""), tab3)

# Add a stub column
tab3 <- cbind(c("", "**Fixed effects**", "Semantics", "Context", "Semantics × context",
             "**Planned contrasts**", "Vio. - int.<br/> (neutral context)", "MCI - int.<br/> (neutral context)",
```

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                  "Vio. - int.<br/> (negative context)", "MCI - int.<br/> (negative context)"), tab3)

# Remove old column names
names(tab3) <- NULL

# Create a huxtable and output as markdown
huxt_tab3 <- huxtable(tab3, add_colnames = FALSE)
print_md(huxt_tab3, max_width = Inf)
```

	Verb-Related N400		Picture-Related N400	
Fixed effects	**F (df)**	**p**	**F (df)**	**p**
Semantics	8.26 (2, 100.8)	< .001	0.73 (2, 37.0)	0.490
Context	0.02 (1, 24.3)	0.888	0.01 (1, 44.1)	0.942
Semantics × context	1.20 (2, 71.7)	0.307	3.89 (2, 52.1)	0.027
Planned contrasts	**Est. [95% CI]**	**p**	**Est. [95% CI]**	**p**
Vio. - int. (neutral context)	-0.17 [-0.54, 0.20]	0.579	-0.04 [-0.42, 0.35]	1.000
MCI - int. (neutral context)	-0.53 [-0.87, -0.19]	0.001	-0.41 [-0.81, 0.00]	0.049
Vio. - int. (negative context)	0.12 [-0.25, 0.49]	0.956	0.18 [-0.23, 0.59]	0.621
MCI - int. (negative context)	-0.24 [-0.58, 0.10]	0.234	0.16 [-0.23, 0.56]	0.678

```
# Export as a word file (after some re-formatting)
tab3_word <- data.frame(map(tab3, function(x){gsub("<br/> ", "\n", x)}))
tab3_word <- data.frame(map(tab3_word, function(x){gsub("\\*|\\_", "", x)}))
huxt_tab3_word <- huxtable(tab3_word, add_colnames = FALSE)
quick_docx(huxt_tab3_word, file = "EEG/tables/table_3.docx", open = FALSE)

## TABLE A1: LMM FOR P600 ## ------------------------------------------------------------------------------

# Extract a table for the F tests for the model (columns: F value (df), p-value)
anovas_tabA1 <- map(tests["P600_VERB"], function(x){
  coefs <- data.frame(paste0(format(round(x$`F value`, 2), trim = TRUE, nsmall = 2),
                      "<br/> (", x$NumDF, ", ", format(round(x$DenDF, 1), trim = TRUE, nsmall = 1), ")"),
               format(round(x$`Pr(>F)`, 3), nsmall = 3),
               fix.empty.names = FALSE)
  coefs[,2] <- substr(coefs[,2], 1, 5)
  coefs[coefs[,2] == "0.000", 2] <- "< .001"
```

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    return(coefs)
})


# Bind all the F-tests to one data frame
anovas_tabA1 <- do.call(cbind, anovas_tabA1)
anovas_tabA1 <- rbind(c("**_F_** (**_df_**)", "**_p_**"), anovas_tabA1)

# Extract a table for the planned contrasts for each model (columns: estimate [CI], p-value)
conts_tabA1 <- map(means_nested["P600_VERB"], function(x){
  x <- as.data.frame(x)
  coefs <- data.frame(paste0(format(round(x$estimate, 2), trim = TRUE, nsmall = 2),
                       "<br/> [", format(round(x$lower.CL, 2), trim = TRUE, nsmall = 2), ", ",
                       format(round(x$upper.CL, 2), trim = TRUE, nsmall = 2), "]"),
                 format(round(x$p.value, 3), nsmall = 3),
                 fix.empty.names = FALSE)
  coefs[,2] <- substr(coefs[,2], 1, 5)
  coefs[coefs[,2] == "0.000", 2] <- "< .001"
  return(coefs)
})


# Bind all the planned contrasts to one data frame
conts_tabA1 <- do.call(cbind, conts_tabA1)
conts_tabA1 <- rbind(c("**Est. [95% CI]**", "**_p_**"), conts_tabA1)

# Bind both data frames (F-tests and contrats) below one another
tabA1 <- rbind(anovas_tabA1, conts_tabA1)

# Add model names (dependent variables) as the first row
tabA1 <- rbind(c("Verb-Related P600", ""), tabA1)

# Add a stub column
tabA1 <- cbind(c("", "**Fixed effects**", "Semantics", "Context", "Semantics × context",
             "**Planned contrasts**", "Vio. - int.<br/> (neutral context)", "MCI - int.<br/> (neutral context)",
             "Vio. - int.<br/> (negative context)", "MCI - int.<br/> (negative context)"), tabA1)

# Remove old column names
names(tabA1) <- NULL
```

```r
# Create a huxtable and output as markdown
huxt_tabA1 <- huxtable(tabA1, add_colnames = FALSE)
print_md(huxt_tabA1, max_width = Inf)
```

	Verb-Related P600	
Fixed effects	***F*** (***df***)	***p***
Semantics	1.20 (2, 102.1)	0.305
Context	0.01 (1, 29.7)	0.920
Semantics × context	0.79 (2, 192.9)	0.454
Planned contrasts	**Est. [95% CI]**	***p***
Vio. - int. (neutral context)	-0.02 [-0.37, 0.33]	1.000
MCI - int. (neutral context)	-0.11 [-0.50, 0.27]	1.000
Vio. - int. (negative context)	0.25 [-0.10, 0.60]	0.217
MCI - int. (negative context)	-0.04 [-0.43, 0.34]	1.000

```r
# Export as a word file (after some re-formatting)
tabA1_word <- data.frame(map(tabA1, function(x){gsub("<br/> ", "\n", x)}))
tabA1_word <- data.frame(map(tabA1_word, function(x){gsub("\\*|\\_", "", x)}))
huxt_tabA1_word <- huxtable(tabA1_word, add_colnames = FALSE)
quick_docx(huxt_tabA1_word, file = "EEG/tables/table_A1.docx", open = FALSE)
```

```r
# ## ADDITIONAL TABLE INTERACTION EFFECTS ## ----------------------------------------------------------
#
# # Checking the MCI-intuitive x context and SEV-intuitive x context interactions separetely (verb)
# summary(models$N400_VERB)$coefficients %>%
#   set_colnames(c("Est.", "SE", "df", "t", "p")) %>%
#   set_rownames(c("(Intercept)", "Semantics: Vio. - int.", "Semantics: MCI - int", "Context",
#                  "(Vio. - int.) × context", "(MCI - int.) × context")) %>%
#   huxtable(add_rownames = "Verb-related N400") %>% add_colnames() %>%
#   set_number_format(value = "%3.3f") %>%
#   quick_docx(file = "EEG/tables/table_ias_verb.docx", open = FALSE)
#
# # Checking the MCI-intuitive x context and SEV-intuitive x context interactions separetely (verb)
# summary(models$N400_PICT)$coefficients %>%
#   set_colnames(c("Est.", "SE", "df", "t", "p")) %>%
#   set_rownames(c("(Intercept)", "Semantics: Vio. - int.", "Semantics: MCI - int", "Context",
```

```
#                "(Vio. - int.) × context", "(MCI - int.) × context")) %>%
#    huxtable(add_rownames = "Picture-related N400") %>% add_colnames() %>%
#    set_number_format(value = "%3.3f") %>%
#    quick_docx(file = "EEG/tables/table_ias_pict.docx", open = FALSE)

# System specs and package versions
sessionInfo()
```

```
## R version 4.0.2 (2020-06-22)
## Platform: x86_64-apple-darwin17.0 (64-bit)
## Running under: macOS Catalina 10.15.6
##
## Matrix products: default
## BLAS:   /System/Library/Frameworks/Accelerate.framework/Versions/A/Frameworks/vecLib.framework/Versions/A/libBLAS.dylib
## LAPACK: /Library/Frameworks/R.framework/Versions/4.0/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 datasets  utils     methods   base
##
## other attached packages:
##  [1] huxtable_5.0.0   flextable_0.5.11 officer_0.3.14   magrittr_1.5     forcats_0.5.0    stringr_1.4.0    dplyr_1.0.0      purrr_0.3.4
## [10] tidyr_1.1.0      tibble_3.0.3     ggplot2_3.3.2    tidyverse_1.3.0  Rmisc_1.5        plyr_1.8.6       lattice_0.20-41
##
## loaded via a namespace (and not attached):
##  [1] nlme_3.1-148     fs_1.4.2         lubridate_1.7.9  httr_1.4.2       numDeriv_2016.8-1.1 tools_4.0.2      backports_
##  [8] R6_2.4.1         afex_0.27-2      DBI_1.1.0        colorspace_1.4-1 withr_2.2.0         tidyselect_1.1.0 emmeans_1.
## [15] curl_4.3         compiler_4.0.2   cli_2.0.2        rvest_0.3.5      xml2_1.3.2          scales_1.1.1     mvtnorm_1.
## [22] commonmark_1.7   systemfonts_0.3.1 digest_0.6.25   foreign_0.8-80   minqa_1.2.4         rmarkdown_2.3    rio_0.5.16
## [29] base64enc_0.1-3  pkgconfig_2.0.3  htmltools_0.5.0  lme4_1.1-23      dbplyr_1.4.4        highr_0.8        rlang_0.4.
## [36] readxl_1.3.1     rstudioapi_0.11  generics_0.0.2   jsonlite_1.7.0   zip_2.1.1           car_3.0-8        Matrix_1.2
## [43] Rcpp_1.0.5       munsell_0.5.0    fansi_0.4.1      abind_1.4-5      gdtools_0.2.2       lifecycle_0.2.0  stringi_1.
## [50] yaml_2.2.1       carData_3.0-4    MASS_7.3-51.6    grid_4.0.2       blob_1.2.1          parallel_4.0.2   crayon_1.3
## [57] haven_2.3.1      splines_4.0.2    hms_0.5.3        knitr_1.29       pillar_1.4.6        uuid_0.1-4       boot_1.3-2
## [64] estimability_1.3 reshape2_1.4.4   reprex_0.3.0     glue_1.4.1       evaluate_0.14       data.table_1.13.0 renv_0.12.
## [71] modelr_0.1.8     vctrs_0.3.2      nloptr_1.2.2.2   cellranger_1.1.0 gtable_0.3.0        assertthat_0.2.1 cpp11_0.2.
```

```
## [78] xfun_0.16          openxlsx_4.1.5     xtable_1.8-4       broom_0.7.0.9001   lmerTest_3.1-2     statmod_1.4.34     ellipsis_0
```