

# Estimation Plots

Chris Bentz

16/01/2023

## Load libraries

If the libraries are not installed yet, you need to install them using, for example, the command: `install.packages("ggplot2")`. For the Hrate package this is different, since it comes from github. The devtools library needs to be installed, and then the `install_github()` function is used.

```
library(ggplot2)
library(ggrepel)
library(plyr)
library(ggExtra)
library(ggpubr)
```

```
##
## Attaching package: 'ggpubr'

## The following object is masked from 'package:plyr':
##
##      mutate
```

## Load Data

Load data table with values per text file.

```
# load estimations from stringBase corpus
estimations.df <- read.csv("~/Github/NaLaFi/results/features.csv")
#head(estimations10.df.)
```

Exclude subcorpora (if needed).

```
#selected <- c("shuffled")
#estimations.df <- estimations.df[!(estimations.df$subcorpus %in% selected), ]
```

Split into separate files by length of chunks in characters.

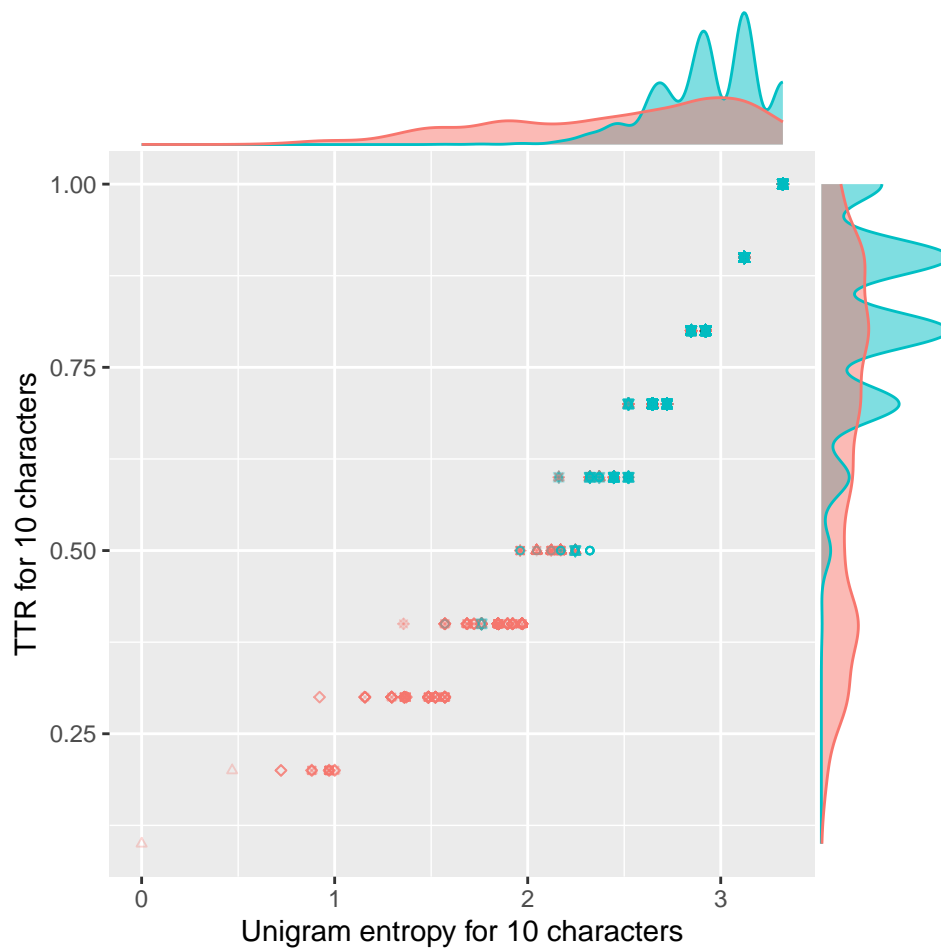
```
estimations10.df <- estimations.df[estimations.df$num.char == 10, ]
estimations100.df <- estimations.df[estimations.df$num.char == 100, ]
estimations1000.df <- estimations.df[estimations.df$num.char == 1000, ]
```

# Scatterplots

## 10 Characters

Entropy rate vs. unigram entropy for characters

```
huni.hrate.10chars.plot <- ggplot(estimations10.df,  
                                  aes(x = huni.chars, y = ttr.chars,  
                                       shape = subcorpus, colour = corpus)) +  
  scale_shape_manual(values = 1:nlevels(estimations10.df$subcorpus)) +  
  geom_point(alpha = 0.3, size = 1) +  
  labs(x = "Unigram entropy for 10 characters", y = "TTR for 10 characters") +  
  theme(legend.position = "none")  
huni.hrate.10chars.plot <- ggMarginal(huni.hrate.10chars.plot,  
                                       groupFill = T, groupColour = T,  
                                       type = "density")  
huni.hrate.10chars.plot
```



TTR vs. repetition rate for characters

```
ttr.rm.10chars.plot <- ggplot(estimations10.df,
                              aes(x = hrate.chars, y = rm.chars,
                                  colour = corpus, shape = subcorpus)) +
  scale_shape_manual(values = 1:nlevels(estimations10.df$subcorpus)) +
  geom_point(alpha = 0.3, size = 1) +
  theme(legend.position = "left") +
  labs(x = "Entropy rate for 10 characters", y = "Repetition rate for 10 characters")
ttr.rm.10chars.plot <- ggMarginal(ttr.rm.10chars.plot,
                                 groupFill = T, groupColour = T,
                                 type = "density")

#ttr.rm.10chars.plot
```

## 100 Characters

Entropy rate vs. unigram entropy for characters

```
huni.hrate.100chars.plot <- ggplot(estimations100.df,
                                    aes(x = huni.chars, y = ttr.chars,
                                        colour = corpus, shape = subcorpus)) +
  scale_shape_manual(values = 1:nlevels(estimations100.df$subcorpus)) +
  geom_point(aes(fill = corpus), alpha = 0.3, size = 1) +
  labs(x = "Unigram entropy for 100 characters", y = "TTR for 100 characters") +
  theme(legend.position = "none")
huni.hrate.100chars.plot <- ggMarginal(huni.hrate.100chars.plot,
                                       groupFill = T, groupColour = T,
                                       type = "density")

#huni.hrate.100chars.plot
```

TTR vs. repetition rate for characters

```
ttr.rm.100chars.plot <- ggplot(estimations100.df,
                              aes(x = hrate.chars, y = rm.chars,
                                  colour = corpus, shape = subcorpus)) +
  scale_shape_manual(values = 1:nlevels(estimations100.df$subcorpus)) +
  geom_point(alpha = 0.3, size = 1) +
  theme(legend.position = "left") +
  labs(x = "Entropy rate for 100 characters", y = "Repetition rate for 100 characters")
ttr.rm.100chars.plot <- ggMarginal(ttr.rm.100chars.plot,
                                 groupFill = T, groupColour = T,
                                 type = "density")

#ttr.rm.100chars.plot
```

## 1000 Characters

Entropy rate vs. unigram entropy for characters

```
huni.hrate.1000chars.plot <- ggplot(estimations1000.df,
                                    aes(x = huni.chars, y = ttr.chars,
                                        colour = corpus, shape = subcorpus)) +
```

```

scale_shape_manual(values = 1:nlevels(estimations1000.df$subcorpus)) +
geom_point(alpha = 0.3, size = 1) +
labs(x = "Unigram entropy for 1000 characters", y = "TTR for 1000 characters") +
theme(legend.position = "none")
huni.hrate.1000chars.plot <- ggMarginal(huni.hrate.1000chars.plot,
                                       groupFill = T, groupColour = T,
                                       type = "density")

#huni.hrate.1000chars.plot

```

## TTR vs. repetition rate for characters

```

ttr.rm.1000chars.plot <- ggplot(estimations1000.df,
                                aes(x = hrate.chars, y = rm.chars,
                                    colour = corpus, shape = subcorpus)) +
scale_shape_manual(values = 1:nlevels(estimations1000.df$subcorpus)) +
geom_point(alpha = 0.3, size = 1) +
theme(legend.position = "left") +
labs(x = "Entropy rate for 1000 characters", y = "Repetition rate for 1000 characters")
ttr.rm.1000chars.plot <- ggMarginal(ttr.rm.1000chars.plot,
                                    groupFill = T, groupColour = T,
                                    type = "density")

#ttr.rm.1000chars.plot

```

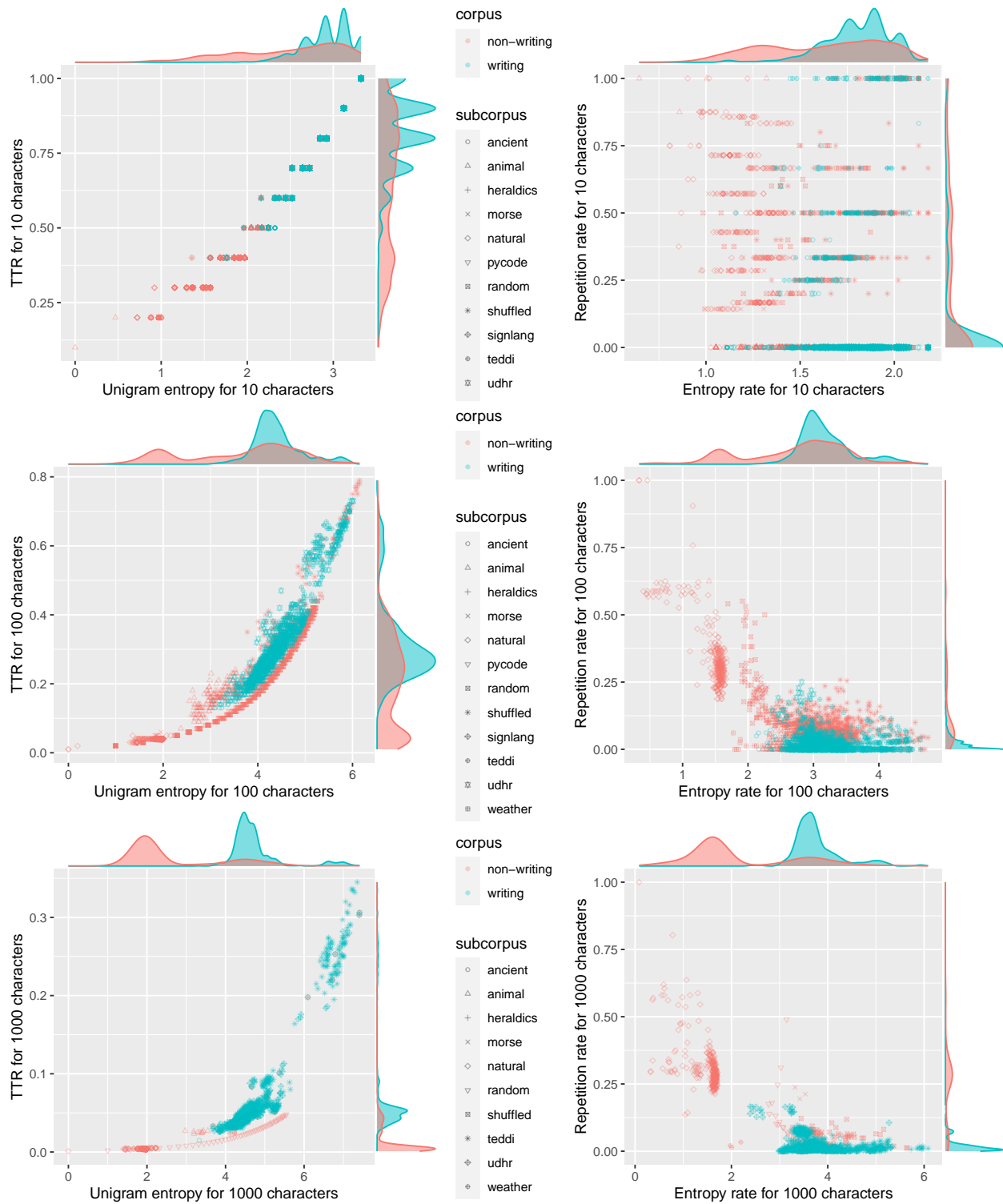
## Combined Plots

```

plots.combined <- ggarrange(huni.hrate.10chars.plot, ttr.rm.10chars.plot,
                             huni.hrate.100chars.plot, ttr.rm.100chars.plot,
                             huni.hrate.1000chars.plot, ttr.rm.1000chars.plot,
                             #labels = c("a)", "b)", "c)", "d)",
                             #      "e)", "f)"),
                             ncol = 2, nrow = 3, widths = c(1, 1.3))

plots.combined

```



Safe complete figure to file

```
ggsave("~/Github/NaLaFi/figures/plots_combined.pdf", plots.combined, width = 10,
        height = 12, dpi = 300, scale = 1, device = cairo_pdf)
```