Dictionary Analysis

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Dictionary analysis

At the level of political parties, which ones make most use of populist rhetoric?

At the level of individual politicians, which ones make most use of populist rhetoric?

I use 3 dictionary to perform the analysis

- Rooduijn & Pauwels: Rooduijn, M., and T. Pauwels. 2011. "Measuring Populism: Comparing Two Methods of Content Analysis." West European Politics 34 (6): 1272–1283.
- Decadri & Boussalis: Decadri, S., & Boussalis, C. (2020). Populism, party membership, and language complexity in the Italian chamber of deputies. Journal of Elections, Public Opinion and Parties, 30(4), 484-503.
- Grundl: Gründl J. Populist ideas on social media: A dictionary-based measurement of populist communication. New Media & Society. December 2020.
- Decadri & Boussalis + Grundl: this is simply a more extended version of the D&B dictionary, which also contains some terms taken from Grundl.

Create the dictionary

I imported the excel file with the words for the dictionaries, excluding NA's.

```
# import dictionaries file
dict <-  read_excel("data/populism_dictionaries.xlsx")
variable.names(dict)
```

```
## [1] "Rooduijn_Pauwels_Italian"
## [2] "Grundl_Italian_adapted"
## [3] "Decadri_Boussalis"
## [4] "Decadri_Boussalis_Grundl_People"
## [5] "Decadri_Boussalis_Grundl_Common Will"
## [6] "Decadri_Boussalis_Grundl_Elite"
```

```
# create the dictionary
Rooduijn_Pauwels_Italian <-
  dictionary(list(populism =
                    (dict$Rooduijn_Pauwels_Italian
                     [!is.na(dict$Rooduijn_Pauwels_Italian)])))

Grundl_Italian_adapted <-
  dictionary(list(populism =
                    dict$Grundl_Italian_adapted
                  [!is.na(dict$Grundl_Italian_adapted)]))

Decadri_Boussalis <-
  dictionary(list(populism =
                    dict$Decadri_Boussalis
                  [!is.na(dict$Decadri_Boussalis)]))

Decadri_Boussalis_Grundl <-
  dictionary(list(people =
                    dict$Decadri_Boussalis_Grundl_People
                  [!is.na(dict$Decadri_Boussalis_Grundl_People)],
                  common_will =
                    dict$`Decadri_Boussalis_Grundl_Common Will`
                  [!is.na(dict$`Decadri_Boussalis_Grundl_Common Will`)],
                  elite =
                    dict$Decadri_Boussalis_Grundl_Elite
                  [!is.na(dict$Decadri_Boussalis_Grundl_Elite)]))
```

```
dictionaries <- c("Rooduijn_Pauwels_Italian", "Grundl_Italian_adapted","Decadri_Boussalis","Decadri_Bous
n.words <- c(length(Rooduijn_Pauwels_Italian$populism),
           length(Grundl_Italian_adapted$populism),
           length(Decadri_Boussalis$populism),
           (length(Decadri_Boussalis_Grundl$people)+
              length(Decadri_Boussalis_Grundl$common_will)+
              length(Decadri_Boussalis_Grundl$elite))
            )
number_of_words <- data.frame(dictionaries,n.words)
kable(number_of_words)
```

dictionaries	n.words
Rooduijn_Pauwels_Italian	18
Grundl_Italian_adapted	135
Decadri_Boussalis	25
Decadri_Boussalis_Grundl	77

Apply dictionary

Decadri_Boussalis_Grundl

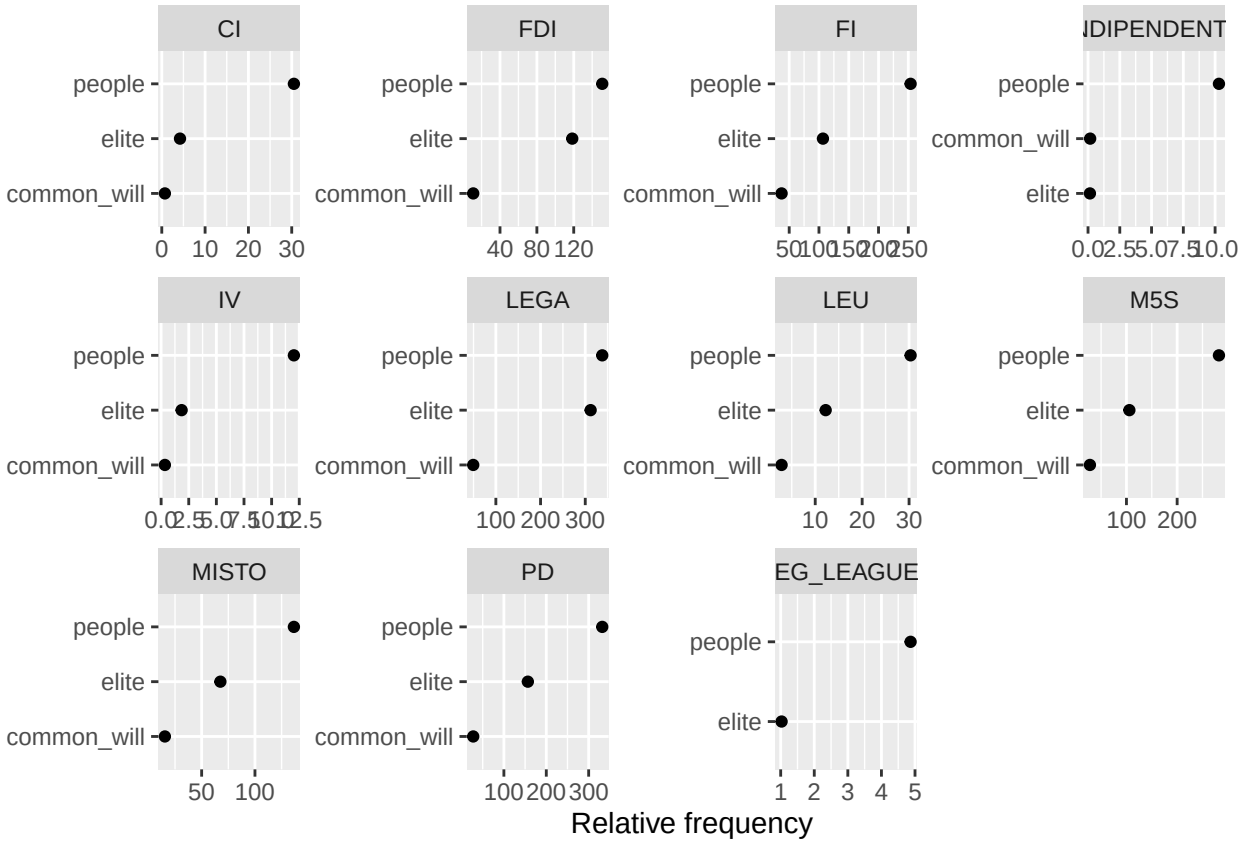
Level of sparsity

daily: 12.08%

weekly: 0.55%

monthly: 0%

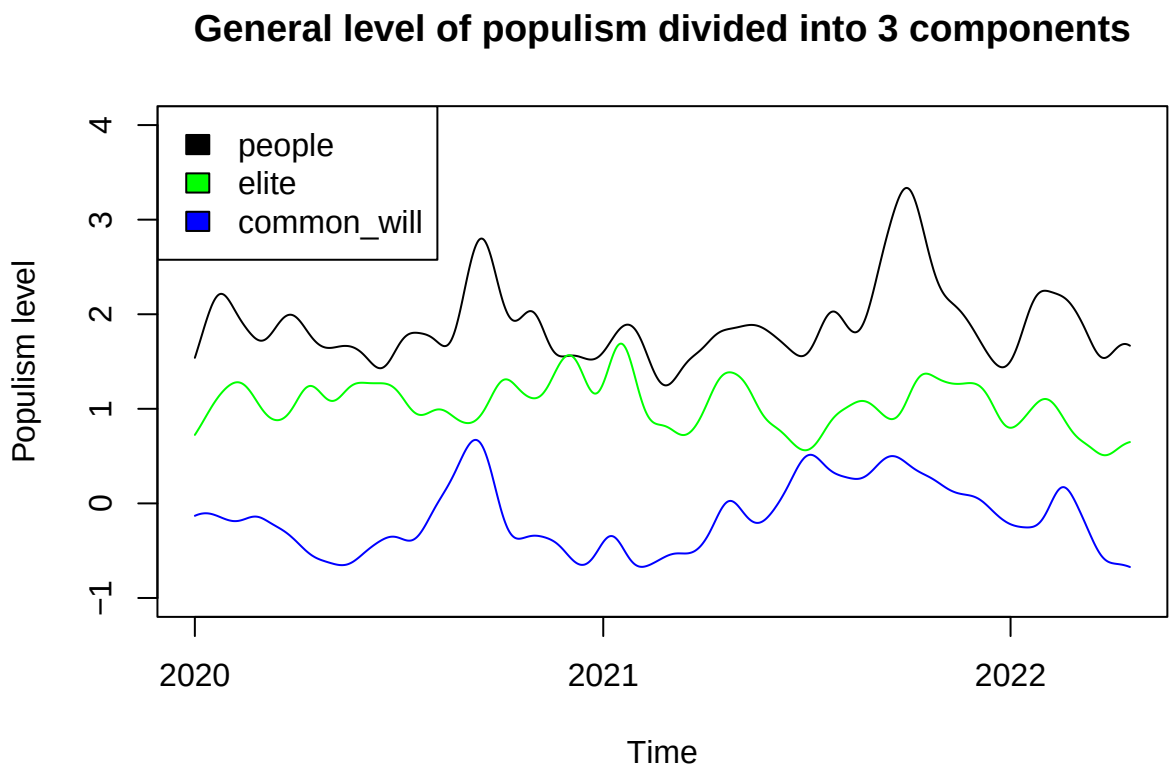
```
# Dictionary analysis with Decadri_Boussalis_Grundl
dfm_dict1  <- dfm_lookup(dfm_weight, dictionary = Decadri_Boussalis_Grundl)
# Group by date
dfm_by_date1 <- dfm_group(dfm_dict1, groups= date)
#dfm_by_date1
# Group by week
dfm_by_week1 <- dfm_group(dfm_dict1, groups= week)
#dfm_by_week1
# Group by month
dfm_by_month1 <- dfm_group(dfm_dict1, groups= month)

#kable(dfm_by_month1)
```



Looking at the populist rhetoric for each party divided into the 3 components people-centrism, anti-elitism and common-will, we note that the most frequent components is People-centrism.

General level of populism in time divided into 3 components

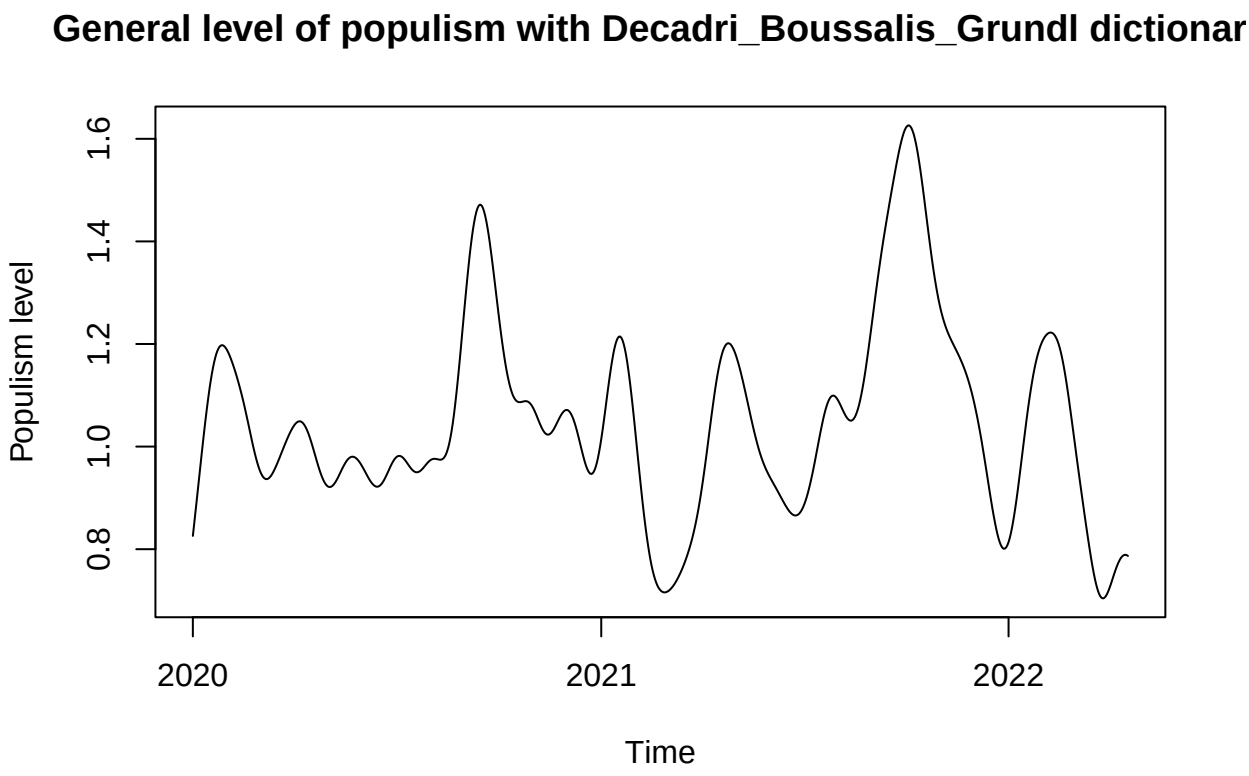
```
dat_smooth1.1 <- ksmooth(x = dfm_by_date1$date,
                         y = dfm_by_date1[,"people"] - !dfm_by_date1[,"people"],
                         kernel = "normal", bandwidth = 30)

dat_smooth1.2 <- ksmooth(x = dfm_by_date1$date,
                         y = dfm_by_date1[,"common_will"] - !dfm_by_date1[,"common_will"],
                         kernel = "normal", bandwidth = 30)

dat_smooth1.3 <- ksmooth(x = dfm_by_date1$date,
                         y = dfm_by_date1[,"elite"] - !dfm_by_date1[,"elite"],
                         kernel = "normal", bandwidth = 30)

plot_time_1 <- plot(dat_smooth1.1$x, dat_smooth1.1$y, type = "l", ylab = "Populism level", xlab = "Time

  lines(dat_smooth1.2$x, dat_smooth1.2$y, type = "l", ylab = "Populism level", xlab = "Time",col = "blu

  lines(dat_smooth1.3$x, dat_smooth1.3$y, type = "l", ylab = "Populism level", xlab = "Time", col = "gr

  legend("topleft", legend = c("people","elite","common_will"), fill = c("black", "green", "blue"))
  title(main = "General level of populism divided into 3 components")
```



This plot is coherent with the previous one and show us that people is the Component that score better.

General level of populism in time

```
dat_smooth1 <- ksmooth(x = dfm_by_date1$date,
                       y = ((dfm_by_date1[,"people"]+
                              dfm_by_date1[,"common_will"]+
                              dfm_by_date1[,"elite"])/3) - ((!dfm_by_date1[,"people"]+
                                                             !dfm_by_date1[,"common_will"]+
                                                             !dfm_by_date1[,"elite"])/3),
                       kernel = "normal", bandwidth = 30)

plot_time_1 <- plot(dat_smooth1$x, dat_smooth1$y, type = "l", ylab = "Populism level", xlab = "Time")
title(main = "General level of populism with Decadri_Boussalis_Grundl dictionary")
```



Rooduijn_Pauwels_Italian

Level of sparsity

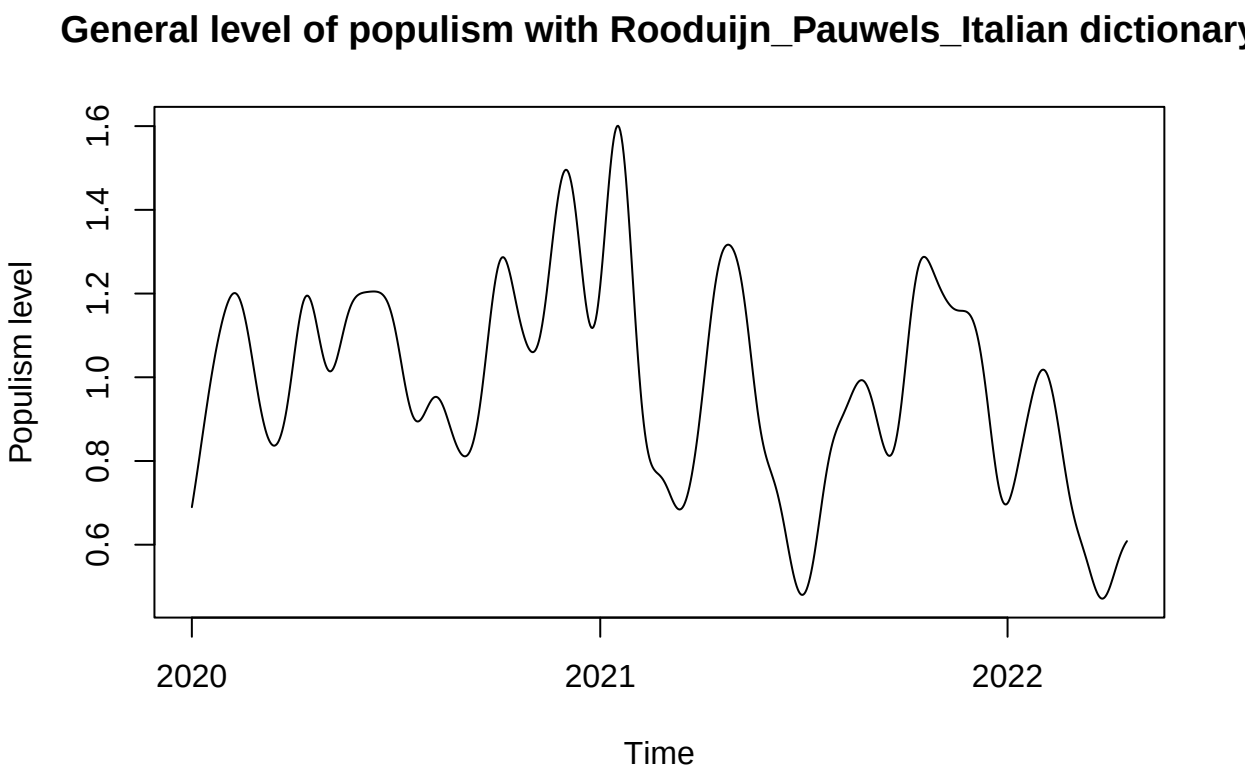
daily: 0.60%

weekly: 0.%

monthly: 0%

```
# Dictionary analysis with Rooduijn_Pauwels_Italian
dfm_dict2  <- dfm_lookup(dfm_weight, dictionary = Rooduijn_Pauwels_Italian)
# Group by date
dfm_by_date2 <- dfm_group(dfm_dict2, groups= date)
#dfm_by_date2
# Group by week
dfm_by_week2 <- dfm_group(dfm_dict2, groups= week)
#dfm_by_week2
# Group by month
dfm_by_month2 <- dfm_group(dfm_dict2, groups= month)

#kable(dfm_by_month2)
```

General level of populism in time



Most populist party

```
# Most populist party
dfm_dict2_tstat_party <- textstat_frequency(dfm_dict2, groups = party_id)
kable(dfm_dict2_tstat_party %>% slice_max(frequency, n = 20))
```

	feature	frequency	rank	docfreq	group
6	populism	303.9474786	1	1919	LEGA
10	populism	149.7512641	1	1671	PD
2	populism	113.7388243	1	1124	FDI
3	populism	98.6906136	1	941	FI
8	populism	87.6625041	1	1119	M5S
9	populism	60.9720255	1	669	MISTO
7	populism	11.7023384	1	175	LEU
1	populism	3.7116701	1	45	CI
5	populism	1.8540424	1	26	IV
11	populism	1.0264294	1	11	REG_LEAGUES
4	populism	0.0833333	1	1	INDIPENDENTE

Most populist politician

```
dict2_tstat_nome <- textstat_frequency(dfm_dict2, groups = nome)

kable(dict2_tstat_nome %>% slice_max(frequency, n = 20))
```

	feature	frequency	rank	docfreq	group
194	populism	42.115152	1	146	FERRERO Roberta
472	populism	15.910436	1	160	SGARBI Vittorio
341	populism	14.112659	1	77	MORANI Alessia
24	populism	13.999694	1	52	BALDELLI Simone
179	populism	13.821584	1	48	FAGGI Antonella
271	populism	13.095709	1	149	LANNUTTI Elio
217	populism	12.884799	1	39	FREGOLENT Sonia
450	populism	12.806346	1	64	RUSPANDINI Massimo
326	populism	12.518396	1	192	MELONI Giorgia
427	populism	12.257891	1	40	RIVOLTA Erica
106	populism	10.788399	1	68	CECCHETTI Fabrizio
283	populism	10.783981	1	108	LOLLOBRIGIDA Francesco
260	populism	10.778644	1	76	IEZZI Igor Giancarlo
230	populism	10.648954	1	155	GARNERO SANTANCHE' Daniela
303	populism	10.133849	1	78	MALAN Lucio
447	populism	9.885108	1	29	RUFA Gianfranco
455	populism	9.561830	1	93	SALVINI Matteo
360	populism	9.110910	1	105	NOBILI Luciano
35	populism	8.689617	1	57	BAZZARO Alex
501	populism	8.495460	1	32	TONELLI Gianni

Grundl_Italian_adapted

Level of sparsity

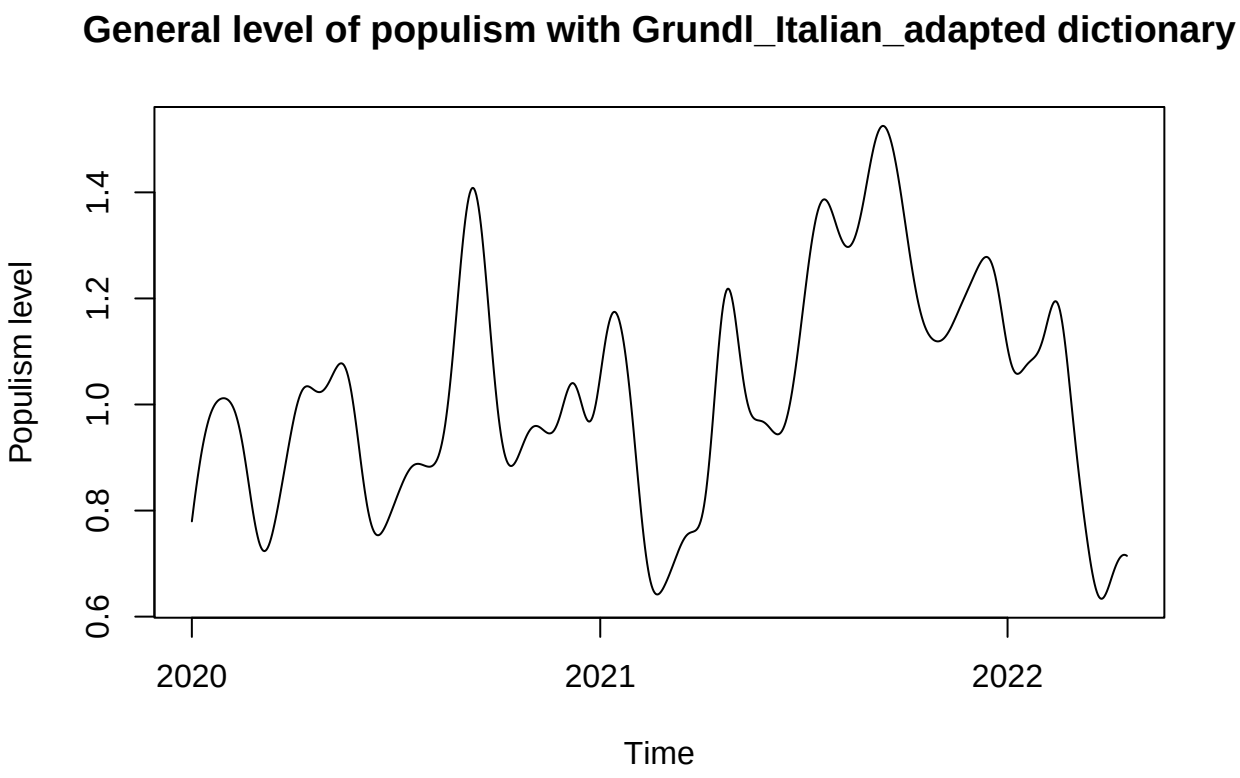
daily: 0.24%

weekly: 0.0%

monthly: 0%

```
# Dictionary analysis with Grundl_Italian_adapted
dfm_dict3  <- dfm_lookup(dfm_weight, dictionary = Grundl_Italian_adapted)
# Group by date
dfm_by_date3<- dfm_group(dfm_dict3, groups= date)
#dfm_by_date3
# Group by week
dfm_by_week3 <- dfm_group(dfm_dict3, groups= week)
#dfm_by_week3
# Group by month
dfm_by_month3 <- dfm_group(dfm_dict3, groups= month)

#kable(dfm_by_month3)
```

General level of populism in time



Most populist party

```
# Most populist party
dict_3_tstat_party <- textstat_frequency(dfm_dict3, groups = party_id)
kable(dict_3_tstat_party %>% slice_max(frequency, n = 20))
```

	feature	frequency	rank	docfreq	group
6	populism	225.678708	1	2075	LEGA
10	populism	153.269683	1	2017	PD
8	populism	133.053746	1	1724	M5S
3	populism	131.838292	1	1524	FI
2	populism	99.425177	1	1087	FDI
9	populism	86.092041	1	997	MISTO
7	populism	15.213765	1	231	LEU
1	populism	10.602522	1	157	CI
5	populism	2.559005	1	40	IV
4	populism	1.983671	1	31	INDIPENDENTE
11	populism	1.505044	1	22	REG_LEAGUES

Most populist politician

```
dict_3_tstat_nome <- textstat_frequency(dfm_dict3, groups = nome)

kable(dict_3_tstat_nome %>% slice_max(frequency, n = 20))
```

	feature	frequency	rank	docfreq	group
287	populism	23.033031	1	240	LANNUTTI Elio
210	populism	19.501980	1	110	FERRERO Roberta
562	populism	19.042283	1	131	VITO Elio
275	populism	16.483870	1	120	IEZZI Igor Giancarlo
494	populism	15.974269	1	184	SGARBI Vittorio
341	populism	11.063928	1	159	MELONI Giorgia
15	populism	10.731212	1	120	ANZALDI Michele
298	populism	10.659433	1	98	LOLLOBRIGIDA Francesco
74	populism	10.645964	1	97	BORGHI Claudio
476	populism	9.238862	1	122	SALVINI Matteo
248	populism	9.004085	1	139	GARNERO SANTANCHE' Daniela
96	populism	8.438949	1	103	CANGINI Andrea
546	populism	8.339166	1	106	URSO Adolfo
224	populism	8.162373	1	101	FONTANA Lorenzo
472	populism	7.850014	1	68	RUSPANDINI Massimo
44	populism	7.832168	1	120	BERGESIO Giorgio Maria
165	populism	7.565932	1	92	DE MARTINI Guido
141	populism	7.036558	1	43	CROSETTO Guido
446	populism	7.000320	1	47	RIVOLTA Erica
359	populism	6.861311	1	73	MORELLI Alessandro

Decadri_Boussalis

Level of sparsity

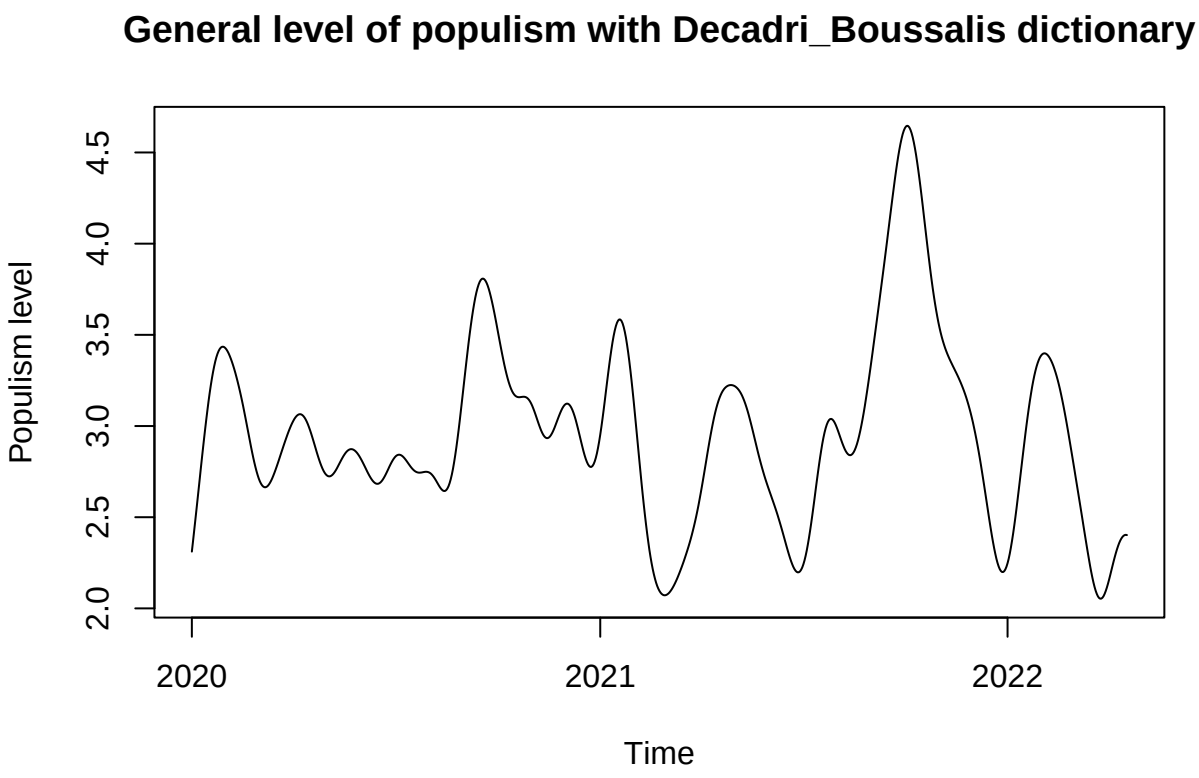
daily: 0%

weekly: 0.0%

monthly: 0%

```
# Dictionary analysis with Decadri_Boussalis
dfm_dict4  <- dfm_lookup(dfm_weight, dictionary = Decadri_Boussalis)
# Group by date
dfm_by_date4<- dfm_group(dfm_dict4, groups= date)
#dfm_by_date4
# Group by week
dfm_by_week4 <- dfm_group(dfm_dict4, groups= week)
#dfm_by_week4
# Group by month
dfm_by_month4 <- dfm_group(dfm_dict4, groups= month)

#kable(dfm_by_month4)
```

General level of populism in time



Most populist party

```
# Most populist party
dict_4_tstat_party <- textstat_frequency(dfm_dict4, groups = party_id)
kable(dict_4_tstat_party %>% slice_max(frequency, n = 20))
```

	feature	frequency	rank	docfreq	group
6	populism	651.348390	1	5672	LEGA
10	populism	493.532735	1	6417	PD
8	populism	376.966170	1	5178	M5S
3	populism	376.609606	1	4532	FI
2	populism	270.814483	1	2960	FDI
9	populism	202.466904	1	2463	MISTO
7	populism	44.919508	1	659	LEU
1	populism	35.105322	1	506	CI
5	populism	14.132863	1	197	IV
4	populism	10.615825	1	153	INDIPENDENTE
11	populism	6.122696	1	93	REG_LEAGUES

DISTRIBUTION OF PARTY POPULISM

```
#TBD
```

Most populist politician

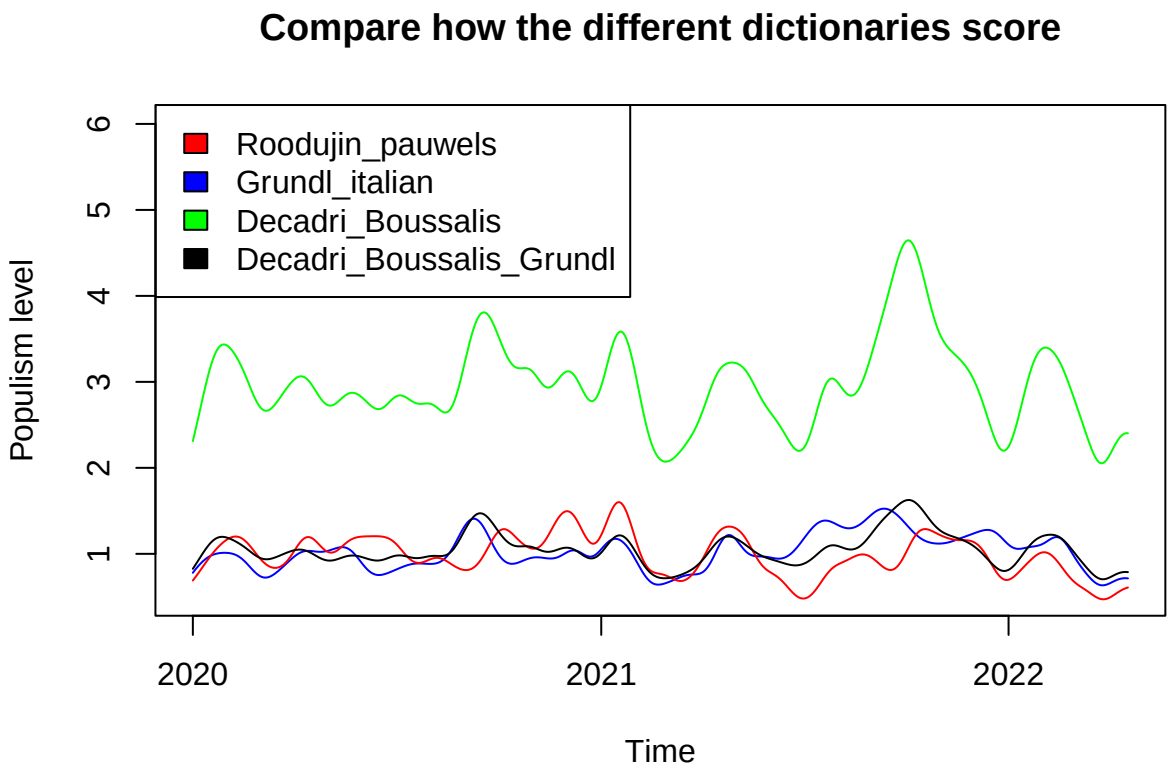
```
dict_4_tstat_nome <- textstat_frequency(dfm_dict4, groups = nome)

kable(dict_4_tstat_nome %>% slice_max(frequency, n = 20))
```

	feature	frequency	rank	docfreq	group
236	populism	62.66405	1	282	FERRERO Roberta
560	populism	41.70723	1	443	SGARBI Vittorio
329	populism	34.85565	1	397	LANNUTTI Elio
391	populism	33.15912	1	496	MELONI Giorgia
344	populism	32.36912	1	358	LOLLOBRIGIDA Francesco
540	populism	29.61242	1	368	SALVINI Matteo
27	populism	27.44810	1	135	BALDELLI Simone
280	populism	26.74696	1	372	GARNERO SANTANCHE' Daniela
530	populism	24.85093	1	184	ROTONDI Gianfranco
68	populism	24.50676	1	252	BONACCINI Stefano
220	populism	24.35617	1	122	FAGGI Antonella
317	populism	24.31241	1	207	IEZZI Igor Giancarlo
128	populism	23.82148	1	195	CECCHETTI Fabrizio
585	populism	23.63509	1	327	TAJANI Antonio
80	populism	22.82617	1	240	BORGHI Claudio
161	populism	21.54784	1	158	CROSETTO Guido
39	populism	21.35229	1	202	BAZZARO Alex
47	populism	21.29380	1	318	BERGESIO Giorgio Maria
535	populism	20.92822	1	140	RUSPANDINI Massimo
365	populism	20.38171	1	185	MALAN Lucio

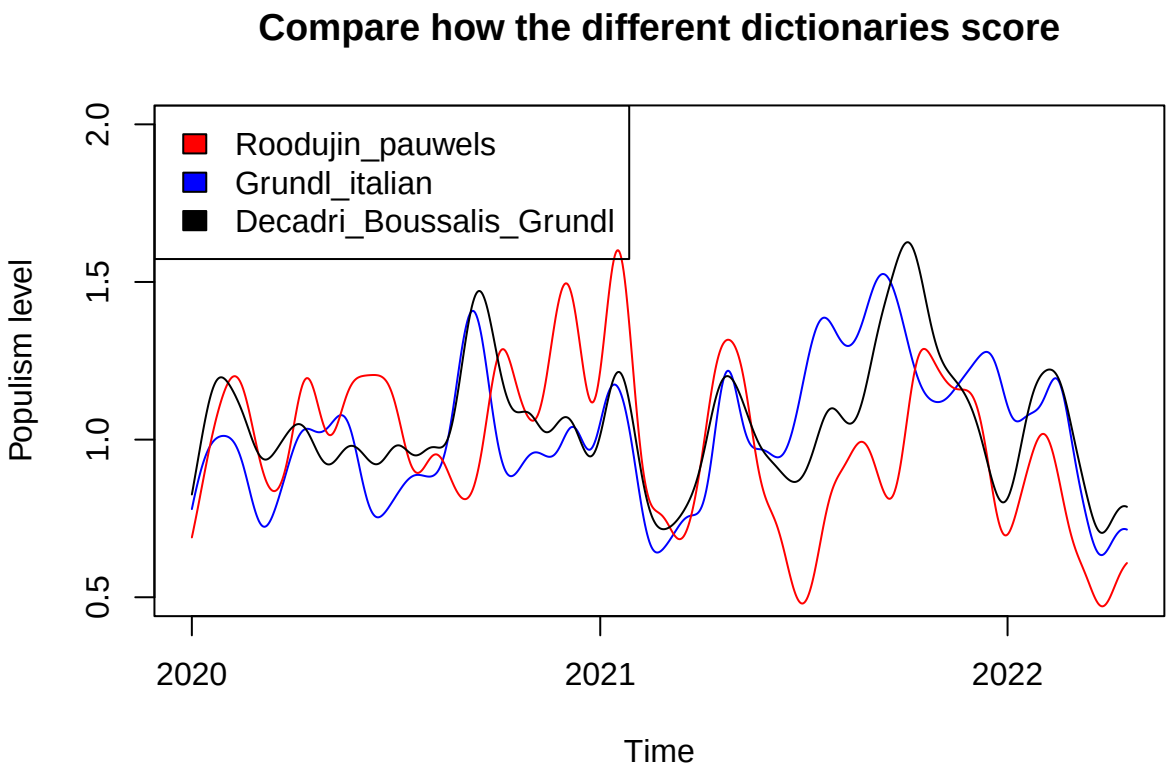
DISTRIBUTION OF POLITICIAN POPULISM

```
#TBD
```

Compare the general level of populism in time for the dictionaries




```
# FOCUS ON THE DICTIONARIES THAT SCORE SIMILARLY
comparison_time <- plot(dat_smooth3$x, dat_smooth3$y, type = "l", ylab = "Populism level", xlab = "Time
  lines(dat_smooth2$x, dat_smooth2$y, type = "l", ylab = "Populism level", xlab = "Time", col = "red") +
  lines(dat_smooth1$x, dat_smooth1$y, type = "l", ylab = "Populism level", xlab = "Time", col = "black"
legend("topleft", legend = c("Roodujin_pauwels","Grundl_italian", "Decadri_Boussalis_Grundl"), fill = c
title(main = "Compare how the different dictionaries score")
```



Compare how the dictionaries score for the most populist party

```
# Create the columns with the "populist score, 11 for the "most populist" and 1 for the least
dfm_dict2_tstat_party$my_rank <- rank(dfm_dict2_tstat_party$frequency)
dict_3_tstat_party$my_rank <- rank(dict_3_tstat_party$frequency)
dict_4_tstat_party$my_rank <- rank(dict_4_tstat_party$frequency)

# define the party list
party <- c("LEGA","PD","M5S","FI","FDI","MISTO","LEU","CI","IV","INDIPENDENTE","REG_LEAGUES")
# create an empty df
party_rank <- data.frame(first = vector(), second = vector(), third = vector(), fourth = vector() )

# loop the rank for each party
for (i in party)
{
  rank_dict_2 <- (dfm_dict2_tstat_party %>% filter(group == i ) %>% .$my_rank)
  rank_dict_3 <- (dict_3_tstat_party %>% filter(group == i ) %>% .$my_rank)
  rank_dict_4 <- (dict_4_tstat_party %>% filter(group == i ) %>% .$my_rank)

  party <- (i)
  party_rank <- rbind(party_rank, cbind(party, rank_dict_2, rank_dict_3, rank_dict_4))
}

# change the format of the columns in numeric
party_rank$rank_dict_2 <- as.numeric(party_rank$rank_dict_2)
party_rank$rank_dict_3 <- as.numeric(party_rank$rank_dict_3)
party_rank$rank_dict_4 <- as.numeric(party_rank$rank_dict_4)
```

```
# Create the column with the sum of the single score
party_rank$total_score <- rowSums(party_rank[,-1])
kable(party_rank)
```

party	rank_dict_2	rank_dict_3	rank_dict_4	total_score
LEGA	11	11	11	33
PD	10	10	10	30
M5S	7	9	9	25
FI	8	8	8	24
FDI	9	7	7	23
MISTO	6	6	6	18
LEU	5	5	5	15
CI	4	4	4	12
IV	3	3	3	9
INDIPENDENTE	1	2	2	5
REG_LEAGUES	2	1	1	4

```
# TEST
ggplot(dict_4_tstat_nome, aes(x=frequency)) +
  geom_histogram(binwidth=.5, colour="black", fill="white") +
    geom_vline(aes(xintercept=mean(frequency, na.rm=T)),   # Ignore NA values for mean
               color="red", linetype="dashed", size=1)
```