

```
1 library("FactoMineR")
2 library("factoextra")
3 library("ggplot2")
4
5 ##### options
6 options(ggrepel.max.overlaps = 17) # set number of tags 10 equals default,
... inf equals all
7 options(scipen = 999) #tun of scientific notation / options(scipen = 0) #
... revert by default
8 #####
9 # this analysis includes SA, TEX, and GB classes – the dataframe includes
... frequency
10 my.data.famd <- read.csv("Table_S7_new_noids.csv",
11                          header = TRUE,
12                          sep = ";")
13 )
14 res.famd <- FAMD(my.data.famd, #MCA by traits-states, FAMD by traits, MFA
15                  graph = FALSE,
16                  #ind.sup = "IDENT",
17                  ncp = 10
18                  ) # it was TRUE for Table_S7_new.csv false for noids
19 # MFA visualization library using the MCA results
20 data.mfa.sa.tex.gb <- fviz_mfa_ind(res.famd,
21                                    habillage = "IDENT", # color by groups
22                                    #"quali.var",
23                                    geom = c("point", "text"), # text,
... point, arrow
24                                    #shape.ind = 1, # 5 rombus, 2 triang, 1
... empty cir, 6 trian
25                                    #pointsize = my.data.frame.index, #use
... request col as pointsize
26                                    palette = c("#00AFBB", "#E7B800",
... "#FC4E07"),
27                                    addEllipses = FALSE, ellipse.type =
... "confidence",
28                                    repel = TRUE, # Avoid text overlapping
29                                    title = "Multiple Correspondence
... Analysis of descriptors to first 2 component dimension of SA, TEX, and GB",
30                                    )
31
32 # This analysis includes a dataframe without ids
33 my.data.famd.noids.nofreq <- read.csv("Table_S7_new_noids_nofreq.csv",
34                                       header = TRUE,
35                                       sep = ";")
36 )
37 res.famd.noid.nofreq <- FAMD(my.data.famd.noids.nofreq,
38                              graph = FALSE)
39
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40 data.corr.sa.sa.tex.gb <- fviz_famd_var(res.famd.noid.nofreq,
41                                     repel = TRUE,
42                                     graph = TRUE, #correlation between
... variables
43                                     title = "Correlation of descriptors
... to first 2 component dimensions for SA, TEX, and GB" #correlation between
... variables
44                                     )
45 data.contrib.sa.tex.gb <- fviz_contrib(res.famd.noid.nofreq,
46                                     "var",
47                                     axes = 1:2,
48                                     title = "Contribution of descriptors
... to first 2 component dimensions for SA, TEX, and GB"
49                                     ) #contribution
50 #data.contrib.sa.tex.gb$eig
51
52 ##### SA- MCA results
53 my.data.famd.sa <- read.csv("Table_S7_SA.csv",
54                             header = TRUE,
55                             sep = ";")
56 )
57 res.famd.sa <- FAMD(my.data.famd.sa,
58                     graph = FALSE
59                     )
60 #print(res.famd.sa)
61
62 # SA - Correlation and contribution plots
63 data.corr.sa <- fviz_famd_var(res.famd.sa,
64                             repel = TRUE,
65                             graph = TRUE,
66                             title = "Correlation of descriptors to first
... 2 component dimensions of SA" #correlation between variables
67                             )
68
69 data.contrib.sa <- fviz_contrib(res.famd.sa,
70                             "var",
71                             axes = 1:2, #contribution
72                             title = "Contribution of descriptors to
... first 2 component dimensions of SA"
73                             )
74 ##### TEX- MCA results
75 my.data.famd.tex <- read.csv("Table_S7_TEX.csv",
76                             header = TRUE,
77                             sep = ";")
78 )
79 res.famd.tex <- FAMD(my.data.famd.tex,
80                     graph = FALSE
81                     )

```

```
82 print(res.famd.tex)
83
84 # TEX - Correlation and contribution plots
85 data.corr.tex <- fviz_famd_var(res.famd.tex,
86                               repel = TRUE,
87                               graph = TRUE,
88                               title = "Correlation of descriptors to first
... 2 component dimensions of TEX" #correlation between variables
89                               )
90
91 data.contrib.tex <- fviz_contrib(res.famd.tex,
92                                "var",
93                                axes = 1:2,
94                                title = "Contribution of descriptors to
... first 2 component dimensions of TEX"
95                                )
96 ##### GB - MCA results
97 my.data.famd.gb <- read.csv("Table_S7_GB.csv",
98                             header = TRUE,
99                             sep = ";")
100 )
101
102 res.famd.gb <- FAMD(my.data.famd.gb,
103                    graph = FALSE
104                    )
105 #print(res.famd.gb)
106 # GB- Correlation and contribution plots
107 data.corr.gb <- fviz_famd_var(res.famd.gb,
108                               repel = TRUE,
109                               graph = TRUE,
110                               title = "Correlation of descriptors to first
... 2 component dimensions of GB"
111                               ) #correlation between variables
112
113 data.contrib.gb <- fviz_contrib(res.famd.gb,
114                                "var",
115                                top = Inf,
116                                axes = 1:2,
117                                title = "Contribution of descriptors to
... first 2 component dimensions of GB"
118                                ) #contribution
119
120 fviz_eig(res.famd.gb, addlabels = TRUE)
```