Dual MFA of Sweet and Skunky Morphs

Valerie Martin

11/4/2019

```
setwd("~/Desktop/Skypilot 2017")
library(plyr)
library(FactoMineR)

stigma <- read.csv("Skypilot 2017 (MASTER) Tab2 08-12-19__Purity added.csv")
cols <- c("Specimen.No.", "Year", "Era", "Species", "Scent.Morph", "Date", "Location", "Altitude..m.",
          "Habitat..NMS.", "Corolla.Flare_1", "Sepal.Length_1", "Tube.Length_1", "Lobe.Length_1", "Lobe
          "No.PVgrains_stigma", "No.PVgrains_off", "No.OtherGrains", "No.OtherTypes")
stigma.sm <- subset(stigma, select = cols)

#-----# summarize data & add columns where appropriate#-----#
ddply(stigma.sm, .(Era,Location, Altitude..m., Scent.Morph), summarise, con=mean(No.PVgrains_stigma, na
```

```
##        Era            Location Altitude..m. Scent.Morph       con
## 1     past     Cumberland Pass      3620.00      Skunky  59.50000
## 2     past     Cumberland Pass      3620.00       Sweet  52.50000
## 3     past     Cumberland Pass      3710.00      Skunky  58.83333
## 4     past     Cumberland Pass      3710.00       Sweet  70.00000
## 5     past         Niwot Ridge      3500.00       Sweet 190.00000
## 6     past         Niwot Ridge      3660.00      Skunky 107.66667
## 7     past         Niwot Ridge      3660.00       Sweet  34.75000
## 8     past         Niwot Ridge      3750.00      Skunky 231.40000
## 9     past         Niwot Ridge      3750.00       Sweet 179.16667
## 10    past       Penn Mountain      3550.00      Skunky  42.75000
## 11    past       Penn Mountain      3550.00       Sweet  78.50000
## 12    past       Penn Mountain      3600.00      Skunky       NaN
## 13    past       Penn Mountain      3600.00       Sweet       NaN
## 14    past       Penn Mountain      3660.00      Skunky       NaN
## 15    past       Penn Mountain      3660.00       Sweet       NaN
## 16    past       Penn Mountain      3700.00      Skunky       NaN
## 17    past       Penn Mountain      3700.00       Sweet       NaN
## 18    past       Penn Mountain      3780.00      Skunky       NaN
## 19    past       Penn Mountain      3780.00       Sweet       NaN
## 20    past       Penn Mountain      3800.00      Skunky       NaN
## 21    past       Penn Mountain      3800.00       Sweet       NaN
## 22    past       Penn Mountain      3880.00      Skunky       NaN
## 23    past       Penn Mountain      3880.00       Sweet       NaN
## 24    past       Penn Mountain      3950.00      Skunky 171.50000
## 25    past       Penn Mountain      3950.00       Sweet  79.00000
## 26    past       Penn Mountain      3960.00      Skunky  40.50000
## 27    past       Penn Mountain      3960.00       Sweet  82.50000
## 28    past       Penn Mountain      4025.00      Skunky  39.00000
## 29    past       Penn Mountain      4025.00       Sweet  47.00000
## 30    past        Rocky Mtn NP      3565.00      Skunky       NaN
## 31    past        Rocky Mtn NP      3565.00       Sweet       NaN
## 32    past        Rocky Mtn NP      3670.00      Skunky       NaN
## 33    past        Rocky Mtn NP      3670.00       Sweet       NaN
```

```
## 34    past        Rocky Mtn NP      3825.00      Skunky  11.25000
## 35    past        Rocky Mtn NP      3825.00       Sweet  56.66667
## 36    past San Francisco Peaks      3596.64      Skunky       NaN
## 37    past San Francisco Peaks      3596.64        <NA>       NaN
## 38    past San Francisco Peaks      3657.60      Skunky       NaN
## 39    past San Francisco Peaks      3703.32      Skunky       NaN
## 40    past San Francisco Peaks      3703.32        <NA>       NaN
## 41    past San Francisco Peaks      3749.04      Skunky       NaN
## 42    past San Francisco Peaks      3749.04       Sweet       NaN
## 43    past San Francisco Peaks      3749.04        <NA>       NaN
## 44    past San Francisco Peaks           NA        <NA>       NaN
## 45 present     Cumberland Pass      3678.00      Skunky  93.40000
## 46 present     Cumberland Pass      3678.00       Sweet  33.75000
## 47 present     Cumberland Pass      3761.00      Skunky  63.20000
## 48 present     Cumberland Pass      3761.00       Sweet 100.60000
## 49 present         Niwot Ridge      3471.00      Skunky 112.87500
## 50 present         Niwot Ridge      3471.00       Sweet 115.85714
## 51 present         Niwot Ridge      3746.00       Sweet 181.14286
## 52 present       Penn Mountain      3573.00      Skunky 146.28571
## 53 present       Penn Mountain      3573.00       Sweet  93.71429
## 54 present       Penn Mountain      3955.00      Skunky 103.42857
## 55 present       Penn Mountain      3955.00       Sweet 100.16667
## 56 present        Rocky Mtn NP      3586.00      Skunky  63.60000
## 57 present        Rocky Mtn NP      3586.00       Sweet 113.60000
## 58 present        Rocky Mtn NP      3739.00      Skunky   6.00000
## 59 present        Rocky Mtn NP      3739.00       Sweet  73.14286
##           het
## 1  140.000000
## 2   40.000000
## 3  260.833333
## 4  301.800000
## 5  744.000000
## 6  244.333333
## 7   11.750000
## 8   73.800000
## 9  134.333333
## 10  74.250000
## 11 103.000000
## 12        NaN
## 13        NaN
## 14        NaN
## 15        NaN
## 16        NaN
## 17        NaN
## 18        NaN
## 19        NaN
## 20        NaN
## 21        NaN
## 22        NaN
## 23        NaN
## 24 403.000000
## 25 229.000000
## 26 174.500000
## 27 247.250000
```

```
## 28  25.000000
## 29  36.000000
## 30         NaN
## 31         NaN
## 32         NaN
## 33         NaN
## 34 256.000000
## 35 646.000000
## 36         NaN
## 37         NaN
## 38         NaN
## 39         NaN
## 40         NaN
## 41         NaN
## 42         NaN
## 43         NaN
## 44         NaN
## 45 156.400000
## 46 205.250000
## 47 303.400000
## 48 191.400000
## 49 263.000000
## 50 284.285714
## 51  91.000000
## 52  78.285714
## 53  81.000000
## 54 631.857143
## 55 110.500000
## 56 652.200000
## 57 426.400000
## 58   6.666667
## 59 164.571429
```

```
stigma.sm$No.TotalPVgrains <- stigma.sm$No.PVgrains_stigma + stigma.sm$No.PVgrains_off
stigma.sm$Purity.tot <- stigma.sm$No.TotalPVgrains/(stigma.sm$No.TotalPVgrains + stigma.sm$No.OtherGrai
stigma.sm$Purity.tot <- as.numeric(as.character(stigma.sm$Purity.tot))
stigma.sm$Purity.on <- stigma.sm$No.PVgrains_stigma/(stigma.sm$No.PVgrains_stigma + stigma.sm$No.OtherG
stigma.sm$Corolla.Length <- stigma.sm$Tube.Length_1 + stigma.sm$Lobe.Length_1

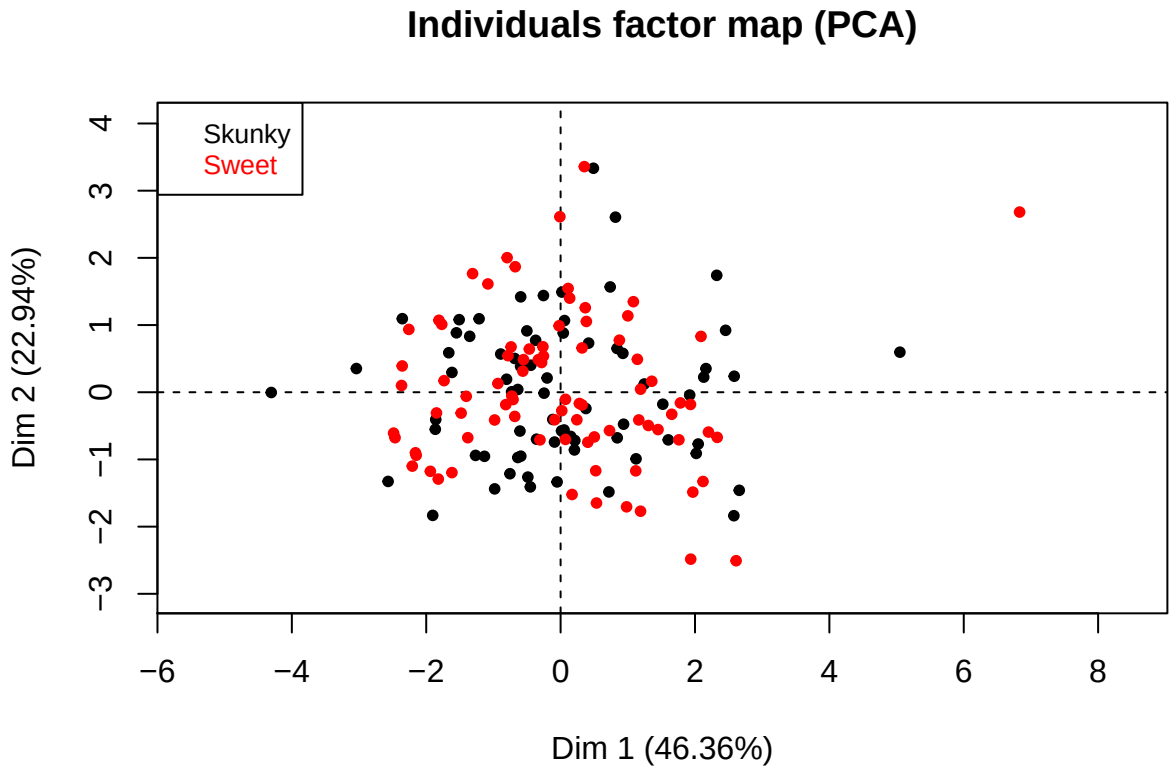
#-----# subsets for analysis #-----#
# subset to complete cases
stigma.sm <- subset(stigma.sm, stigma.sm$Corolla.Flare_1 > 0 & stigma.sm$Sepal.Length_1 > 0 & stigma.sm$
                    stigma.sm$Lobe.Length_1 >0 & stigma.sm$Lobe.Width_1 >0) #eliminates all flowers w
# subset by morph
stigma.sw <- subset(stigma.sm, Scent.Morph =="Sweet") #subset to sweet morph
stigma.sk <- subset(stigma.sm, Scent.Morph =="Skunky") #subset to skunky morph
nohab <- subset(stigma.sm, select = -c(stigma$Habitat..NMS.)) #subset to eliminate habitat
stigma.new <- subset(stigma.sm, Era == "present") #selects for new era
stigma.sw.new <- subset(stigma.sw, Era == "present") #selects for new sweet
stigma.sw$No.Totalgrains <- stigma.sw$No.TotalPVgrains+stigma.sw$No.OtherGrains
stigma.sk.new <- subset(stigma.sk, Era == "present") #selects for new skunky
stigma.sk$No.Totalgrains <- stigma.sk$No.TotalPVgrains+stigma.sk$No.OtherGrains
```

Dual Multiple Factor Analysis DMFA is part of the multitable PCA family - it analyzes several sets of

observations measured on the same set of variables, provides a set of common factor scores (compromise) and projects each of the original data sets onto the compromise to analyze commonalities and discrepancies

```
stigma.new.dmfa <- subset(stigma.sm, select = c("Scent.Morph", "Corolla.Flare_1", "Sepal.Length_1", "Tu

DMFA(stigma.new.dmfa, num.fact = 1, scale.unit = TRUE, ncp = 5,
     quanti.sup = NULL, quali.sup = NULL, graph = TRUE, axes=c(1,2))
```




```
## $eig
##        eigenvalue percentage of variance cumulative percentage of variance
## comp 1  2.3181867              46.363733                           46.36373
## comp 2  1.1467943              22.935887                           69.29962
## comp 3  0.7562746              15.125493                           84.42511
## comp 4  0.4145126               8.290251                           92.71536
## comp 5  0.3642318               7.284636                          100.00000
##
## $var
## $var$coord
##                      Dim.1      Dim.2       Dim.3      Dim.4       Dim.5
## Corolla.Flare_1 0.8388127 -0.2451080  0.01131479  0.1165816  0.47180085
## Sepal.Length_1  0.1905959  0.8406357  0.48408276 -0.1092543  0.10359652
## Tube.Length_1   0.5132659  0.5732942 -0.59568681  0.2128057 -0.08810681
## Lobe.Length_1   0.8355232 -0.1133805 -0.12230536 -0.5041234 -0.14123368
## Lobe.Width_1    0.7853103 -0.1962821  0.38988347  0.2992627 -0.32123782
##
## $var$cor
##                      Dim.1      Dim.2       Dim.3      Dim.4       Dim.5
## Corolla.Flare_1 0.8388127 -0.2451080  0.01131479  0.1165816  0.47180085
## Sepal.Length_1  0.1905959  0.8406357  0.48408276 -0.1092543  0.10359652
```

```
## Tube.Length_1   0.5132659  0.5732942 -0.59568681  0.2128057 -0.08810681
## Lobe.Length_1   0.8355232 -0.1133805 -0.12230536 -0.5041234 -0.14123368
## Lobe.Width_1    0.7853103 -0.1962821  0.38988347  0.2992627 -0.32123782
##
## $var$cos2
##                      Dim.1      Dim.2        Dim.3      Dim.4       Dim.5
## Corolla.Flare_1 0.70360672 0.06007794 0.0001280245 0.01359127 0.222596043
## Sepal.Length_1  0.03632678 0.70666836 0.2343361193 0.01193650 0.010732240
## Tube.Length_1   0.26344188 0.32866626 0.3548427727 0.04528628 0.007762809
## Lobe.Length_1   0.69809896 0.01285513 0.0149586003 0.25414036 0.019946951
## Lobe.Width_1    0.61671232 0.03852665 0.1520091224 0.08955817 0.103193737
##
## $var$contrib
##                     Dim.1     Dim.2       Dim.3     Dim.4     Dim.5
## Corolla.Flare_1 30.351599  5.238772  0.01692831  3.278856 61.113844
## Sepal.Length_1   1.567035 61.621193 30.98558476  2.879646  2.946541
## Tube.Length_1   11.364136 28.659564 46.91982969 10.925188  2.131283
## Lobe.Length_1   30.114010  1.120962  1.97793229 61.310651  5.476445
## Lobe.Width_1    26.603221  3.359508 20.09972496 21.605659 28.331887
##
##
## $ind
## $ind$coord
##           Dim.1        Dim.2        Dim.3        Dim.4        Dim.5
## 1   -0.68311752  0.502566986  0.361105979 -0.857937396 -0.097963878
## 2   -4.30626942 -0.003795812  0.693247003 -0.075126897  0.127963033
## 3    0.81648573  2.605761526  0.085472715 -0.178266787  0.120011960
## 4   -0.05215067 -1.334476912  0.461942399  0.367066745 -0.992635857
## 5    2.16354243  0.352152815 -0.934663214  0.235736777 -1.073452427
## 6    1.52103015 -0.178144773 -0.227398091  1.420195328 -0.595461907
## 7   -0.50200127  0.913236237  0.609793505 -0.964596652 -0.196777939
## 8    2.32369177  1.740302316  0.784441609 -0.463536360 -0.291926296
## 9   -0.59395431  1.419631622  0.510992317 -0.224874190 -0.876610198
## 10  -0.59504936  0.383428987 -1.254241701 -0.391607492 -0.835937938
## 11  -1.85861862 -0.406383760 -0.421407397  0.269555368 -1.043587090
## 12   2.04812794 -0.770229818  0.263738351  0.604047385 -1.425986940
## 13   0.21175022 -0.717908021 -0.280809123 -0.587513240  0.261855501
## 14  -0.24641228 -0.013764807 -1.198653151  0.190507806  0.905909020
## 15   0.01367590 -0.574657127 -0.594737001 -0.394147634  0.637111836
## 16  -0.72885639  0.006675281 -0.824010801  0.038339480 -0.632088462
## 17  -1.21305991  1.093430251  0.407282245 -0.830546671 -0.057860060
## 18   0.84000018  0.651758105 -1.611830312  1.217593865 -0.035861882
## 19   0.84335902 -0.678420850 -0.390476194 -0.913942871  0.838903556
## 20  -1.55037098  0.884431047 -1.735251871  0.114989269  0.061283817
## 21   0.01917497  1.490786153  0.533887582  0.069312439  0.076016386
## 22   0.73840750  1.567104864  0.710710954 -0.901736368 -1.091690502
## 23  -1.66420795  0.587890699  0.446049437 -0.186371331  0.648083734
## 25  -1.90324875 -1.832663848  1.348677353 -0.506761104 -0.672811728
## 26  -0.98119929 -1.438301395  0.923760397 -0.316711442  0.248969706
## 28  -0.20083825  0.211921987  1.337266824  0.339895367 -0.261401028
## 29   2.45574267  0.921538458 -1.391328724  0.465390826 -0.458389307
## 30  -0.25547285  1.439170189 -2.317620672 -1.335134040 -0.809847884
## 31   2.58411457  0.238126680 -0.780403351  0.196467019  0.003047605
## 32  -2.56736863 -1.327612821 -0.030564823  0.040376688 -0.393986719
```

```
## 33  -0.59248136 -0.951603250 -0.627395646 -0.005720154  0.491231609
## 34   0.20579278 -0.858691261 -0.383949543  0.502863015  0.813836656
## 35   2.13040171  0.224637159 -1.024773273  0.532579509  0.011765032
## 36  -1.13340621 -0.953546938 -0.111939515  1.036209130 -0.824455109
## 37  -1.61694858  0.294571686 -1.289383893 -0.444268811 -0.268985457
## 38  -0.48772916 -1.262770679 -0.170564844  0.175492542 -0.003220519
## 39  -0.45012210 -1.408466608 -0.028316391  0.100637478  0.315855928
## 40  -0.60504965 -0.577752355 -0.649189379  0.314706813  0.255739616
## 41   1.92100286 -0.041471301  2.060374883 -0.599180583 -0.981544848
## 42  -0.63738412  0.041011470  0.948722825 -1.408757081  0.617670622
## 43   0.04029729  0.881440476  0.764148424  0.814599951  0.154181719
## 44  -0.37128224  0.772894313  1.087538849  0.274836778 -0.513048159
## 45   0.48832551  3.333780411 -0.276532309  0.338175089 -0.445007801
## 46   1.24527183  0.122637158  0.823670386  0.253100001  1.997400084
## 47   0.15051119 -0.657596096  1.635691399 -1.735102221 -0.185276973
## 48   0.41693162  0.731316633  0.869014652 -2.368815771 -0.572029467
## 49   5.05002715  0.596323449  1.207392720  0.151323594  1.002348463
## 50  -0.89134720  0.568843005  1.213083368  1.114275243  0.586339068
## 51   0.05782301  1.066852397  1.415149832  0.272405607 -0.067062163
## 52   2.65908474 -1.459668990  0.172841816 -0.984892803 -0.102466771
## 55   0.71914226 -1.483500971  0.048569377 -0.054617363  0.157770922
## 56   0.05168206 -0.561503423 -0.248215120  0.655349360 -0.614502676
## 57   1.60237249 -0.708887000 -0.030780485  0.194894288  1.432006670
## 58  -1.26591841 -0.939914309 -0.475169751  0.895038307  0.571436065
## 59   0.93742326 -0.475588177 -0.230627256  0.328515592  0.121627521
## 60  -0.35828258 -0.698943473 -0.467317052  0.381896615  0.214396202
## 61  -1.86475002 -0.551314281 -0.894268288  0.091846698  0.227103402
## 62  -2.35555969  1.094924328  0.368473267  0.675156381  0.152322355
## 63  -3.03940578  0.352756934  0.570976655  0.308784506  0.806389309
## 64  -1.35290569  0.832483588  0.650773277  0.436709545  0.763174558
## 65  -1.50974972  1.080017515  0.364972913  0.170931052  0.765210541
## 66   0.92708626  0.578991503  1.048644193 -0.277111036  0.332704490
## 67  -0.09033423 -0.741085947 -0.987244729  0.290263049 -0.563450776
## 68  -0.11667187 -0.404919862 -0.357298704 -0.068999114  0.046187968
## 69  -0.80413077  0.193305199 -1.040101443 -0.135297007  0.499238339
## 70  -0.75378523 -1.212562001  0.385924533  0.708254680  0.299602946
## 71  -0.63693745 -0.971245118 -0.038058768  0.646579926 -0.437278063
## 72   0.37650189 -0.242362617 -0.677274099 -1.390288971  0.290893132
## 73  -0.44271614  0.402313433 -1.397796736  0.180321840  0.751820337
## 74   1.12284542 -0.991017447 -0.245447354  0.168626221 -0.029355258
## 75   2.01877062 -0.910711269 -0.200941351  0.212151538 -0.181466597
## 76   2.57869770 -1.837531541  0.731650315  0.805862681  0.026018970
## 77   0.11244687  1.544413680  0.909749702  0.165029655 -0.637721521
## 78  -0.67534679  1.867943902  0.165639053 -0.213105481  0.141137152
## 79   0.35316175  3.357699464 -0.266516026  0.509866976 -0.486509679
## 80  -0.81611707 -0.184287645 -0.806850149  0.478262239  0.041395408
## 81   0.98217164 -1.705391461  0.813682472  0.336365638 -0.264468901
## 82   0.31925372  0.659250789  1.027961016  0.273913163 -0.069863076
## 83  -2.25901102  0.935301486  0.487694322 -0.120842441 -0.177811385
## 85  -1.84693086 -0.308326236 -0.527660659  0.922104306 -0.438678983
## 86  -0.25526069  0.537022173 -1.090484824 -0.620373356  0.164833785
## 87  -2.46384076 -0.676694793  1.212196617 -0.705093849 -0.058500455
## 88  -0.26335822  0.677408104  1.104402381  0.612645937  0.203504500
## 89  -1.93811883 -1.176861775 -0.525047250 -0.201660674  0.259531079
```

```
## 90  -0.08728217 -0.409427679 -0.548550273 -0.030407824 -0.134787715
## 91   0.50182918 -0.665221689 -0.518070672 -1.725040792  0.829922595
## 92   0.52275425 -1.168380422  0.024234756 -1.439217576 -0.470117878
## 94  -1.76861548  1.010534428  1.057911503  0.249962628  0.591586335
## 95   0.53445826 -1.648482288 -0.039192187  0.064339122  0.966126476
## 96  -0.93281732  0.129907915 -1.313169871 -0.405194471  0.235461588
## 97   1.35717591  0.163830934 -1.584086361 -0.614655259  0.858401114
## 98  -0.01084098  2.612541642 -0.480483277 -0.095025327 -0.381775701
## 99  -1.38150804 -0.676357000  1.395957670 -0.723070156  0.102612797
## 100 -0.55240728  0.485690008  0.683996386  0.068055973  0.450398115
## 101  0.07227194 -0.105318425  1.403877777 -0.389624527  0.365923798
## 102  0.31987113 -0.188604179  1.565515988 -0.219847738 -0.034378068
## 103 -2.20721591 -1.099658497  0.163770902  0.030535195 -0.124846185
## 104  1.11847946 -1.169961899  1.111197998  0.577629103 -1.762107354
## 105  0.07208830 -0.701896159  0.022111127  0.252636194  0.848185776
## 106 -0.73717886  0.674679040  0.900393946 -0.283601971  0.448109766
## 109  1.16392146 -0.412382852  0.115653978 -0.060821001 -0.441739512
## 110 -2.15998279 -0.901370049  1.378024225 -0.493621944 -0.080998188
## 112  2.61221038 -2.507448727  0.920439239  0.746035058  0.718944696
## 113 -0.56206794  0.314061828 -0.974537323 -0.196274721  0.118993959
## 114  0.01765278 -0.274162699 -0.673887732 -0.235691949 -0.071192708
## 115 -0.78311346  0.544188349  1.193077152  0.772633616  0.429453506
## 116  0.13527693  1.399795813  0.967974260  0.191050947 -0.611365615
## 117 -0.02228701  0.989281236  0.917491204  0.851245207 -0.323344478
## 118 -1.61713016 -1.195959605 -0.435037865 -1.034372617  0.219111653
## 119  0.27945554 -0.167460519 -1.787090598 -0.853151695 -0.304436893
## 120  6.83150479  2.681714663  1.506030884  0.306728225  0.636926669
## 121 -0.79581689  2.002705587  0.176917104  0.441665308  0.456618105
## 122 -1.81067072  1.070912182  0.210883936  0.940219249  0.932706757
## 123 -1.30994795  1.765331361  0.037465997 -0.177050637  0.658371303
## 124 -0.98214612 -0.412977393  1.312260407 -0.083524292 -0.345072739
## 125 -0.30703836 -0.709191390  0.097455666  0.484954680 -1.743623851
## 126  1.14242655  0.490219688 -1.415054235 -0.227801783  0.578121922
## 127  0.38371374  1.053309508 -1.221557845  0.803968075 -0.606965241
## 128  2.08982880  0.831348822 -1.902710740 -1.051329722  0.982114239
## 129  2.20112821 -0.592920752 -0.285914029  0.454451671  0.883894720
## 130  1.30599510 -0.494922869 -1.048967780  0.352071304  0.130623950
## 131 -0.70744541 -0.108698568 -0.459334436 -0.479714118 -0.569854090
## 132  2.33091817 -0.671594828 -0.440743411 -0.844468482 -0.521284172
## 133 -0.46528913  0.642929044 -1.467955412  0.623821691  0.400092837
## 134  2.11969949 -1.328348195  0.135561681 -0.918755934  0.360724492
## 135 -2.14947169 -0.938261893  0.196112177  0.278046924 -0.321075096
## 136  0.40495132 -0.744301670 -0.045370556  0.663444483  0.313934091
## 137  1.19033178  0.045526511 -0.768601129  0.238537938 -1.057200820
## 138 -0.68198619 -0.359867796 -0.398375755  0.001649710 -1.160299465
## 139 -2.36736973  0.100706538  0.831244762  0.225476002  0.259048265
## 140  1.00088511  1.137082225  1.184079252  0.111893522 -0.742527548
## 141  0.36725881  1.257965944  0.433699673 -0.885086457  0.325793720
## 142  0.17105555 -1.521911158  0.186839620  0.039072444  0.005400185
## 143 -2.48536105 -0.608151563  0.346545620  0.248189172 -0.659595972
## 144 -1.48013074 -0.310657142 -0.809731269 -0.046632367  0.593973419
## 145 -0.72574910 -0.057381814 -0.877312784  0.424026549  0.125215101
## 146 -2.35721209  0.391408493  0.603592356 -0.240957227  0.376370196
## 147  1.08349737  1.347440549  0.872553965  0.042037276 -0.046328732
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## 148 -1.08212426  1.612076908  0.532048034  0.240519850  0.657157975
## 149 -1.73417267  0.172329656 -0.995355879  0.025652641 -0.645054822
## 150 -0.28251828  0.442263055 -1.114782938  0.183182137 -0.174342677
## 151 -1.40409381 -0.060668012 -1.075806247 -0.112130242 -0.139727284
## 152 -1.81990269 -1.292275207 -0.221434832  0.467624226 -0.065955093
## 153  0.24190585 -0.409434467 -0.250227553  0.741292282 -0.357263133
## 154  1.93326402 -0.181808013  0.036807101  0.943321494  0.301517985
## 155  1.96816090 -1.486174220  0.468505282  0.421107186  0.105417865
## 156  1.19004478 -1.770838298  0.324349580  0.923031511  0.939639250
## 157  1.78386630 -0.158914156  0.002109684  0.243221113 -0.051741228
## 158  1.76092723 -0.708022277 -0.155943573  0.930669457 -0.884320319
## 159  1.44995758 -0.555588151 -0.416027094  0.322281559 -0.668519974
## 160 -0.33094779  0.485008491 -0.808485152 -0.356714362  0.137179613
## 161  1.65417159 -0.327839479 -0.665016742 -0.717788565 -1.080381286
## 162  0.87482327  0.775073814 -1.046028121 -1.216095641 -0.038169872
## 163  1.93683354 -2.483808145  0.850188309 -1.682378272 -0.070174137
## 164  0.72819700 -0.570691779 -0.426802182  0.476654834  0.669645089
##
## $ind$cos2
##             Dim.1        Dim.2        Dim.3        Dim.4        Dim.5
## 1   2.925200e-01 1.583261e-01 8.173989e-02 4.613982e-01 6.015845e-03
## 2   9.736108e-01 7.564711e-07 2.523242e-02 2.963288e-04 8.597101e-04
## 3   8.876664e-02 9.041113e-01 9.727642e-04 4.231491e-03 1.917793e-03
## 4   8.725345e-04 5.713272e-01 6.846024e-02 4.322678e-02 3.161132e-01
## 5   6.797339e-01 1.800820e-02 1.268582e-01 8.069800e-03 1.673300e-01
## 6   4.851691e-01 6.655239e-03 1.084404e-02 4.229740e-01 7.435762e-02
## 7   1.038331e-01 3.436312e-01 1.532117e-01 3.833697e-01 1.595435e-02
## 8   5.778849e-01 3.241408e-01 6.585755e-02 2.299598e-02 9.120754e-03
## 9   1.023071e-01 5.844549e-01 7.572310e-02 1.466489e-02 2.228500e-01
## 10  1.209975e-01 5.023892e-02 5.375673e-01 5.240496e-02 2.387913e-01
## 11  6.966147e-01 3.330311e-02 3.581100e-02 1.465238e-02 2.196188e-01
## 12  5.781224e-01 8.176101e-02 9.586326e-03 5.028606e-02 2.802442e-01
## 13  4.258846e-02 4.895329e-01 7.489739e-02 3.278533e-01 6.512799e-02
## 14  2.578694e-02 8.046654e-05 6.101859e-01 1.541348e-02 3.485333e-01
## 15  1.501777e-04 2.651618e-01 2.840163e-01 1.247416e-01 3.259302e-01
## 16  3.296963e-01 2.765472e-05 4.214014e-01 9.122683e-04 2.479624e-01
## 17  4.173161e-01 3.390649e-01 4.704263e-02 1.956270e-01 9.494200e-04
## 18  1.353746e-01 8.149881e-02 4.984447e-01 2.844352e-01 2.467428e-04
## 19  2.484270e-01 1.607579e-01 5.325532e-02 2.917507e-01 2.458091e-01
## 20  3.868154e-01 1.258811e-01 4.845712e-01 2.127880e-03 6.043996e-04
## 21  1.459955e-04 8.824719e-01 1.131800e-01 1.907623e-03 2.294482e-03
## 22  9.893608e-02 4.456138e-01 9.165339e-02 1.475440e-01 2.162527e-01
## 23  7.348511e-01 9.170169e-02 5.278982e-02 9.215998e-03 1.114414e-01
## 25  3.809227e-01 3.531924e-01 1.912766e-01 2.700550e-02 4.760284e-02
## 26  2.378876e-01 5.111603e-01 2.108512e-01 2.478477e-02 1.531618e-02
## 28  1.960543e-02 2.182909e-02 8.692001e-01 5.615315e-02 3.321224e-02
## 29  6.524999e-01 9.188438e-02 2.094471e-01 2.343421e-02 2.273441e-02
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## 31  9.045864e-01 7.681440e-03 8.250206e-02 5.228846e-03 1.258183e-06
## 32  7.743882e-01 2.070738e-01 1.097554e-04 1.915330e-04 1.823667e-02
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## 37  5.642610e-01 1.872706e-02 3.587997e-01 4.259703e-02 1.561512e-02
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## 113 2.229562e-01 6.961010e-02 6.702532e-01 2.718759e-02 9.992905e-03
## 114 5.279733e-04 1.273510e-01 7.694152e-01 9.411853e-02 8.587301e-03
## 115 1.969238e-01 9.509272e-02 4.570733e-01 1.916885e-01 5.922173e-02
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## 151 6.229759e-01 1.163050e-03 3.657186e-01 3.973054e-03 6.169378e-03
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## 153 6.058311e-02 1.735512e-01 6.482299e-02 5.689024e-01 1.321403e-01
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## 157 9.733605e-01 7.724569e-03 1.361394e-06 1.809471e-02 8.188844e-04
## 158 5.878810e-01 9.503870e-02 4.610432e-03 1.642092e-01 1.482606e-01
## 159 6.706322e-01 9.846452e-02 5.520991e-02 3.313178e-02 1.425616e-01
## 160 9.570047e-02 2.055388e-01 5.711355e-01 1.111825e-01 1.644274e-02
## 161 5.507314e-01 2.163223e-02 8.901105e-02 1.036983e-01 2.349270e-01
## 162 1.942142e-01 1.524497e-01 2.776688e-01 3.752976e-01 3.697275e-04
## 163 2.783136e-01 4.577052e-01 5.362657e-02 2.099893e-01 3.653457e-04
## 164 3.094224e-01 1.900453e-01 1.062936e-01 1.325751e-01 2.616636e-01
##
## $ind$contrib
##            Dim.1        Dim.2        Dim.3        Dim.4        Dim.5
## 1   1.298706e-01 1.420923e-01 1.112393e-01 1.145623e+00 1.699896e-02
## 2   5.160863e+00 8.105729e-06 4.099820e-01 8.784590e-03 2.900411e-02
## 3   1.855313e-01 3.819901e+00 6.232234e-03 4.946198e-02 2.551171e-02
## 4   7.569022e-04 1.001855e+00 1.820390e-01 2.097107e-01 1.745301e+00
## 5   1.302719e+00 6.976620e-02 7.452450e-01 8.649386e-02 2.041061e+00
## 6   6.438661e-01 1.785373e-02 4.411257e-02 3.139256e+00 6.280561e-01
## 7   7.013415e-02 4.691903e-01 3.172155e-01 1.448178e+00 6.858723e-02
## 8   1.502716e+00 1.703853e+00 5.249404e-01 3.344246e-01 1.509513e-01
## 9   9.818067e-02 1.133794e+00 2.227499e-01 7.870636e-02 1.361142e+00
## 10  9.854302e-02 8.270898e-02 1.341996e+00 2.386891e-01 1.237766e+00
## 11  9.613919e-01 9.290850e-02 1.514932e-01 1.130906e-01 1.929069e+00
## 12  1.167439e+00 3.337516e-01 5.933833e-02 5.679010e-01 3.601816e+00
## 13  1.247865e-02 2.899482e-01 6.726841e-02 5.372370e-01 1.214546e-01
## 14  1.689836e-02 1.065916e-04 1.225676e+00 5.648799e-02 1.453649e+00
## 15  5.205135e-05 1.857806e-01 3.017440e-01 2.417956e-01 7.189883e-01
## 16  1.478440e-01 2.506813e-05 5.792347e-01 2.287826e-03 7.076951e-01
## 17  4.095288e-01 6.726125e-01 1.415076e-01 1.073640e+00 5.929912e-03
## 18  1.963716e-01 2.389767e-01 2.216294e+00 2.307467e+00 2.278015e-03
## 19  1.979452e-01 2.589293e-01 1.300702e-01 1.300076e+00 1.246564e+00
## 20  6.689462e-01 4.400588e-01 2.568702e+00 2.057999e-02 6.652457e-03
## 21  1.023267e-04 1.250298e+00 2.431579e-01 7.477440e-03 1.023540e-02
## 22  1.517442e-01 1.381589e+00 4.308983e-01 1.265580e+00 2.111006e+00
## 23  7.707882e-01 1.944357e-01 1.697285e-01 5.406159e-02 7.439653e-01
## 25  1.008117e+00 1.889506e+00 1.551690e+00 3.997028e-01 8.018213e-01
## 26  2.679380e-01 1.163811e+00 7.279599e-01 1.561198e-01 1.097952e-01
## 28  1.122568e-02 2.526590e-02 1.525545e+00 1.798130e-01 1.210333e-01
## 29  1.678362e+00 4.777599e-01 1.651385e+00 3.371058e-01 3.721855e-01
## 30  1.816391e-02 1.165218e+00 4.582194e+00 2.774472e+00 1.161709e+00
## 31  1.858418e+00 3.190060e-02 5.195496e-01 6.007723e-02 1.645159e-05
## 32  1.834410e+00 9.915752e-01 7.969527e-04 2.537418e-03 2.749499e-01
## 33  9.769431e-02 5.094418e-01 3.357931e-01 5.092675e-05 4.274281e-01
## 34  1.178637e-02 4.148173e-01 1.257584e-01 3.935772e-01 1.173181e+00
## 35  1.263115e+00 2.838873e-02 8.958687e-01 4.414683e-01 2.451753e-04
## 36  3.575124e-01 5.115251e-01 1.068946e-02 1.671188e+00 1.203994e+00
## 37  7.276329e-01 4.881629e-02 1.418251e+00 3.072007e-01 1.281587e-01
## 38  6.620295e-02 8.970812e-01 2.481806e-02 4.793447e-02 1.837139e-05
## 39  5.638720e-02 1.116030e+00 6.840134e-04 1.576341e-02 1.767130e-01
## 40  1.018830e-01 1.877873e-01 3.595271e-01 1.541498e-01 1.158475e-01
```

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## 41  1.027013e+00 9.675604e-04 3.621440e+00 5.587867e-01 1.706518e+00
## 42  1.130635e-01 9.462228e-04 7.678342e-01 3.088893e+00 6.757785e-01
## 43  4.519303e-04 4.370879e-01 4.981317e-01 1.032807e+00 4.210719e-02
## 44  3.836439e-02 3.360648e-01 1.008970e+00 1.175656e-01 4.662370e-01
## 45  6.636494e-02 6.252544e+00 6.523498e-02 1.779975e-01 3.507726e-01
## 46  4.315670e-01 8.461102e-03 5.787562e-01 9.970453e-02 7.066764e+00
## 47  6.304599e-03 2.432771e-01 2.282399e+00 4.685767e+00 6.080417e-02
## 48  4.837818e-02 3.008802e-01 6.442330e-01 8.733597e+00 5.795985e-01
## 49  7.097531e+00 2.000537e-01 1.243615e+00 3.564051e-02 1.779623e+00
## 50  2.211127e-01 1.820403e-01 1.255365e+00 1.932482e+00 6.089591e-01
## 51  9.305105e-04 6.403117e-01 1.708416e+00 1.154949e-01 7.966097e-03
## 52  1.967815e+00 1.198648e+00 2.548510e-02 1.509762e+00 1.859759e-02
## 55  1.439294e-01 1.238108e+00 2.012398e-03 4.642929e-03 4.409044e-02
## 56  7.433606e-04 1.773730e-01 5.255877e-02 6.684614e-01 6.688643e-01
## 57  7.145734e-01 2.827071e-01 8.082388e-04 5.911924e-02 3.632290e+00
## 58  4.459964e-01 4.970033e-01 1.926133e-01 1.246849e+00 5.783966e-01
## 59  2.445633e-01 1.272462e-01 4.537431e-02 1.679742e-01 2.620319e-02
## 60  3.572492e-02 2.748317e-01 1.862996e-01 2.269981e-01 8.141879e-02
## 61  9.677455e-01 1.709941e-01 6.822200e-01 1.312979e-02 9.135614e-02
## 62  1.544216e+00 6.744519e-01 1.158246e-01 7.094787e-01 4.109772e-02
## 63  2.570972e+00 7.000578e-02 2.781157e-01 1.484026e-01 1.151808e+00
## 64  5.093953e-01 3.898828e-01 3.612835e-01 2.968356e-01 1.031664e+00
## 65  6.343513e-01 6.562123e-01 1.136345e-01 4.547498e-02 1.037176e+00
## 66  2.391995e-01 1.885937e-01 9.380912e-01 1.195194e-01 1.960685e-01
## 67  2.271039e-03 3.089726e-01 8.314544e-01 1.311336e-01 5.623445e-01
## 68  3.788369e-03 9.224035e-02 1.089060e-01 7.409990e-03 3.778750e-03
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## 70  1.581303e-01 8.271622e-01 1.270555e-01 7.807455e-01 1.589947e-01
## 71  1.129051e-01 5.306895e-01 1.235658e-03 6.506913e-01 3.386927e-01
## 72  3.945065e-02 3.304563e-02 3.913071e-01 3.008436e+00 1.498847e-01
## 73  5.454697e-02 9.105668e-02 1.666774e+00 5.060894e-02 1.001195e+00
## 74  3.508810e-01 5.525166e-01 5.139318e-02 4.425688e-02 1.526379e-03
## 75  1.134211e+00 4.665994e-01 3.444510e-02 7.005239e-02 5.832891e-02
## 76  1.850635e+00 1.899557e+00 4.566631e-01 1.010771e+00 1.199142e-03
## 77  3.518962e-03 1.341869e+00 7.060454e-01 4.238914e-02 7.203650e-01
## 78  1.269327e-01 1.962955e+00 2.340530e-02 7.068379e-02 3.528362e-02
## 79  3.471101e-02 6.342587e+00 6.059481e-02 4.046172e-01 4.192504e-01
## 80  1.853638e-01 1.910624e-02 5.553599e-01 3.560105e-01 3.035252e-03
## 81  2.684693e-01 1.636179e+00 5.648052e-01 1.760978e-01 1.238910e-01
## 82  2.836559e-02 2.445029e-01 9.014509e-01 1.167768e-01 8.645416e-03
## 83  1.420223e+00 4.921370e-01 2.029010e-01 2.272844e-02 5.600278e-02
## 85  9.493387e-01 5.348152e-02 2.375189e-01 1.323399e+00 3.408663e-01
## 86  1.813376e-02 1.622435e-01 1.014444e+00 5.990139e-01 4.812635e-02
## 87  1.689449e+00 2.576134e-01 1.253530e+00 7.737924e-01 6.061903e-03
## 88  1.930250e-02 2.581568e-01 1.040503e+00 5.841841e-01 7.335648e-02
## 89  1.045396e+00 7.791726e-01 2.351720e-01 6.329553e-02 1.193079e-01
## 90  2.120172e-03 9.430553e-02 2.566975e-01 1.439134e-03 3.218037e-02
## 91  7.008607e-02 2.489520e-01 2.289638e-01 4.631582e+00 1.220016e+00
## 92  7.605277e-02 7.679825e-01 5.010327e-04 3.223914e+00 3.914750e-01
## 94  8.705360e-01 5.744933e-01 9.547451e-01 9.724802e-02 6.199073e-01
## 95  7.949640e-02 1.528802e+00 1.310351e-03 6.442892e-03 1.653326e+00
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## 97  5.126160e-01 1.509992e-02 2.140654e+00 5.880223e-01 1.305182e+00
## 98  3.270824e-05 3.839805e+00 1.969452e-01 1.405430e-02 2.581707e-01
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## 99  5.311617e-01 2.573563e-01 1.662391e+00 8.137509e-01 1.865063e-02
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## 101 1.453648e-03 6.240099e-03 1.681308e+00 2.362779e-01 2.371766e-01
## 102 2.847541e-02 2.001176e-02 2.090758e+00 7.522715e-02 2.093406e-03
## 103 1.355843e+00 6.802968e-01 2.288033e-02 1.451216e-03 2.760839e-02
## 104 3.481576e-01 7.700629e-01 1.053347e+00 5.193124e-01 5.499905e+00
## 105 1.446270e-03 2.771587e-01 4.170715e-04 9.933945e-02 1.274302e+00
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## 109 3.770225e-01 9.567180e-02 1.141064e-02 5.757550e-03 3.456392e-01
## 110 1.298436e+00 4.570766e-01 1.619953e+00 3.792447e-01 1.162093e-02
## 112 1.899049e+00 3.537096e+00 7.227349e-01 8.662616e-01 9.155487e-01
## 113 8.792199e-02 5.548979e-02 8.101878e-01 5.995968e-02 2.508074e-02
## 114 8.672538e-05 4.228628e-02 3.874038e-01 8.646097e-02 8.977626e-03
## 115 1.706748e-01 1.666024e-01 1.214300e+00 9.291328e-01 3.266802e-01
## 116 5.092926e-03 1.102331e+00 7.993121e-01 5.681055e-02 6.620526e-01
## 117 1.382368e-04 5.505824e-01 7.181127e-01 1.127820e+00 1.851916e-01
## 118 7.277963e-01 8.046662e-01 1.614518e-01 1.665270e+00 8.503964e-02
## 119 2.173428e-02 1.577639e-02 2.724469e+00 1.132878e+00 1.641667e-01
## 120 1.298831e+01 4.045832e+00 1.934891e+00 1.464327e-01 7.185704e-01
## 121 1.762569e-01 2.256405e+00 2.670105e-02 3.036108e-01 3.693148e-01
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## 124 2.684554e-01 9.594787e-02 1.469024e+00 1.085816e-02 2.109171e-01
## 125 2.623646e-02 2.829500e-01 8.102200e-03 3.660437e-01 5.385128e+00
## 126 3.632256e-01 1.351961e-01 1.708185e+00 8.076902e-02 5.920104e-01
## 127 4.097647e-02 6.241583e-01 1.272966e+00 1.006024e+00 6.525565e-01
## 128 1.215462e+00 3.888207e-01 3.088405e+00 1.720317e+00 1.708498e+00
## 129 1.348375e+00 1.977771e-01 6.973643e-02 3.214445e-01 1.383858e+00
## 130 4.746823e-01 1.378027e-01 9.386703e-01 1.929265e-01 3.022290e-02
## 131 1.392855e-01 6.647072e-03 1.799893e-01 3.581753e-01 5.751986e-01
## 132 1.512077e+00 2.537450e-01 1.657145e-01 1.109935e+00 4.813262e-01
## 133 6.025120e-02 2.325460e-01 1.838292e+00 6.056916e-01 2.835385e-01
## 134 1.250456e+00 9.926739e-01 1.567699e-02 1.313805e+00 2.304845e-01
## 135 1.285829e+00 4.952573e-01 3.280937e-02 1.203280e-01 1.826012e-01
## 136 4.563789e-02 3.116598e-01 1.756050e-03 6.850776e-01 1.745691e-01
## 137 3.943265e-01 1.166035e-03 5.039539e-01 8.856161e-02 1.979728e+00
## 138 1.294408e-01 7.285657e-02 1.353863e-01 4.235900e-06 2.384683e+00
## 139 1.559740e+00 5.705558e-03 5.894495e-01 7.912819e-02 1.188644e-01
## 140 2.787972e-01 7.273886e-01 1.196053e+00 1.948680e-02 9.765975e-01
## 141 3.753741e-02 8.902675e-01 1.604601e-01 1.219276e+00 1.880078e-01
## 142 8.143184e-03 1.303051e+00 2.978014e-02 2.376139e-03 5.165446e-05
## 143 1.719091e+00 2.080685e-01 1.024494e-01 9.587299e-02 7.706310e-01
## 144 6.097054e-01 5.429320e-02 5.593332e-01 3.384586e-03 6.249201e-01
## 145 1.465861e-01 1.852385e-03 6.565952e-01 2.798444e-01 2.777179e-02
## 146 1.546384e+00 8.618729e-02 3.107966e-01 9.036713e-02 2.509117e-01
## 147 3.267199e-01 1.021414e+00 6.494913e-01 2.750425e-03 3.801818e-03
## 148 3.258923e-01 1.462023e+00 2.414852e-01 9.003937e-02 7.649447e-01
## 149 8.369598e-01 1.670717e-02 8.451728e-01 1.024224e-03 7.370275e-01
## 150 2.221330e-02 1.100384e-01 1.060155e+00 5.222721e-02 5.383911e-02
## 151 5.486712e-01 2.070629e-03 9.873176e-01 1.956934e-02 3.458222e-02
## 152 9.217566e-01 9.394913e-01 4.182930e-02 3.403491e-01 7.705257e-03
## 153 1.628593e-02 9.430866e-02 5.341448e-02 8.552824e-01 2.260825e-01
## 154 1.040165e+00 1.859554e-02 1.155718e-03 1.385001e+00 1.610338e-01
## 155 1.078055e+00 1.242574e+00 1.872482e-01 2.760043e-01 1.968425e-02
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## 156 3.941364e-01 1.764171e+00 8.974607e-02 1.326061e+00 1.563914e+00
## 157 8.856141e-01 1.420718e-02 3.796851e-06 9.207318e-02 4.742026e-03
## 158 8.629840e-01 2.820179e-01 2.074549e-02 1.348098e+00 1.385191e+00
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## 160 3.048168e-02 1.323370e-01 5.576130e-01 1.980486e-01 3.333263e-02
## 161 7.615195e-01 6.046517e-02 3.772714e-01 8.019064e-01 2.067495e+00
## 162 2.129907e-01 3.379628e-01 9.334165e-01 2.301792e+00 2.580666e-03
## 163 1.044010e+00 3.470714e+00 6.166220e-01 4.405324e+00 8.722573e-03
## 164 1.475767e-01 1.832255e-01 1.553968e-01 3.536214e-01 7.942914e-01
##
## $ind$dist
##         1         2         3         4         5         6         7
## 1.2630416 4.3642388 2.7404616 1.7655036 2.6241941 2.1836913 1.5578903
##         8         9        10        11        12        13        14
## 3.0567354 1.8569498 1.7106643 2.2268653 2.6936874 1.0260721 1.5344844
##        15        16        17        18        19        20        21
## 1.1159721 1.2693604 1.8778015 2.2830258 1.6920496 2.4927787 1.5869561
##        22        23        25        26        28        29        30
## 2.3475711 1.9413682 3.0837357 2.0117376 1.4343601 3.0401333 3.1537722
##        31        32        33        34        35        36        37
## 2.7169819 2.9174865 1.3753361 1.3573209 2.4337241 1.9899365 2.1525645
##        38        39        40        41        42        43        44
## 1.3756344 1.5156130 1.1339192 3.0429532 1.9168018 1.4317224 1.5022352
##        45        46        47        48        49        50        51
## 3.4265753 2.5095500 2.4850513 2.7207257 5.3238871 2.0432954 1.7952350
##        52        55        56        57        58        59        60
## 3.1955833 1.6577619 1.0893412 2.2714957 1.9594406 1.1317470 1.0134517
##        61        62        63        64        65        66        67
## 2.1542905 2.7133617 3.2301782 1.9287403 2.0478652 1.5753912 1.3905935
##        68        69        70        71        72        73        74
## 0.5586851 1.4259553 1.6669802 1.3999045 1.6360672 1.7057078 1.5272323
##        75        76        77        78        79        80        81
## 2.2412375 3.3483739 1.9129626 2.0094969 3.4592710 1.2575629 2.1721386
##        82        83        85        86        87        88        89
## 1.2935021 2.5023959 2.1971254 1.3981206 2.9152062 1.4712896 2.3505332
##        90        91        92        94        95        96        97
## 0.7037393 2.1511129 1.9827582 2.3834456 1.9855013 1.6825766 2.3436617
##        98        99       100       101       102       103       104
## 2.6853562 2.2018358 1.1029006 1.5076125 1.6242673 2.4747506 2.7006010
##       105       106       109       110       112       113       114
## 1.1320724 1.4458790 1.3179460 2.7617327 3.8770608 1.1903619 0.7682581
##       115       116       117       118       119       120       121
## 1.7647192 1.8234502 1.6279233 2.3135738 2.0298721 7.5252201 2.2536686
##       122       123       124       125       126       127       128
## 2.4947560 2.3018605 1.7272059 1.9703116 1.9834190 1.9400186 3.2785173
##       129       130       131       132       133       134       135
## 2.5032106 1.7865951 1.1305494 2.6576941 1.8259169 2.6926282 2.3915316
##       136       137       138       139       140       141       142
## 1.1219368 1.7844562 1.4490034 2.5344614 2.0641313 1.6718171 1.5433530
##       143       144       145       146       147       148       149
## 2.6764952 1.8160227 1.2227671 2.5047331 1.9377375 2.1313297 2.1082076
##       150       151       152       153       154       155       156
## 1.2578177 1.7789368 2.2921773 0.9828123 2.1800659 2.5476092 2.5282774
##       157       158       159       160       161       162       163
```

```
## 1.8081125 2.2966599 1.7705700 1.0697997 2.2290029 1.9850883 3.6713442
##       164
## 1.3091006
##
##
## $svd
## $svd$vs
## [1] 1.5225592 1.0708848 0.8696405 0.6438265 0.6035162
##
## $svd$U
##                [,1]         [,2]         [,3]         [,4]         [,5]
##   [1,] -0.448663997  0.469300681  0.415235916 -1.332559911 -0.162321875
##   [2,] -2.828309919 -0.003544556  0.797165018 -0.116688107  0.212029167
##   [3,]  0.536258755  2.433278933  0.098285111 -0.276886373  0.198854586
##   [4,] -0.034251983 -1.246144179  0.531187758  0.570133009 -1.644754340
##   [5,]  1.420990632  0.328842842 -1.074769620  0.366149535 -1.778663874
##   [6,]  0.998995705 -0.166352876 -0.261485159  2.205866499 -0.986654420
##   [7,] -0.329708858  0.852786595  0.701201805 -1.498224503 -0.326052467
##   [8,]  1.526174943  1.625106872  0.902029733 -0.719970914 -0.483709145
##   [9,] -0.390102591  1.325662262  0.587590279 -0.349277618 -1.452504882
##  [10,] -0.390821808  0.358048757 -1.442253054 -0.608250027 -1.385112720
##  [11,] -1.220720063 -0.379484090 -0.484576541  0.418677026 -1.729178312
##  [12,]  1.345187679 -0.719246167  0.303272840  0.938214528 -2.362798193
##  [13,]  0.139075190 -0.670387695 -0.322902528 -0.912533472  0.433883150
##  [14,] -0.161840849 -0.012853676 -1.378331758  0.295899288  1.501051752
##  [15,]  0.008982182 -0.536618976 -0.683888326 -0.612195411  1.055666536
##  [16,] -0.478704782  0.006233426 -0.947530364  0.059549396 -1.047343025
##  [17,] -0.796724273  1.021053066  0.468334023 -1.290016269 -0.095871596
##  [18,]  0.551702788  0.608616426 -1.853444348  1.891183180 -0.059421575
##  [19,]  0.553908833 -0.633514289 -0.449008739 -1.419548369  1.390026620
##  [20,] -1.018266437  0.825888100 -1.995366851  0.178602880  0.101544614
##  [21,]  0.012593904  1.392106877  0.613917553  0.107657014  0.125955838
##  [22,]  0.484977842  1.463373840  0.817246822 -1.400589064 -1.808883569
##  [23,] -1.093033294  0.548976581  0.512912433 -0.289474459  1.073846494
##  [24,] -1.250032639 -1.711354738  1.550844651 -0.787108167 -1.114819702
##  [25,] -0.644440794 -1.343096231  1.062232466 -0.491920475  0.412531949
##  [26,] -0.131908332  0.197894282  1.537723678  0.527930058 -0.433130108
##  [27,]  1.612904505  0.860539268 -1.599889480  0.722851295 -0.759531099
##  [28,] -0.167791727  1.343907517 -2.665032978 -2.073748162 -1.341882638
##  [29,]  1.697217742  0.222364413 -0.897386139  0.305155219  0.005049749
##  [30,] -1.686219199 -1.239734441 -0.035146502  0.062713615 -0.652818817
##  [31,] -0.389135177 -0.888613988 -0.721442515 -0.008884620  0.813949361
##  [32,]  0.135162414 -0.801852102 -0.441503739  0.781053603  1.348491859
##  [33,]  1.399224176  0.209767802 -1.178387214  0.827209662  0.019494145
##  [34,] -0.744408608 -0.890429018 -0.128719295  1.609453967 -1.366086173
##  [35,] -1.061993866  0.275073168 -1.482663076 -0.690044297 -0.445697175
##  [36,] -0.320335097 -1.179184381 -0.196132586  0.272577379 -0.005336259
##  [37,] -0.295635193 -1.315236291 -0.032561030  0.156311485  0.523359503
##  [38,] -0.397389891 -0.539509322 -0.746503137  0.488806858  0.423749394
##  [39,]  1.261693341 -0.038726201  2.369225937 -0.930655346 -1.626377023
##  [40,] -0.418626811  0.038296807  1.090936772 -2.188100459  1.023453293
##  [41,]  0.026466810  0.823095483  0.878694592  1.265247608  0.255472387
##  [42,] -0.243854051  0.721734292  1.250561376  0.426880182 -0.850098433
##  [43,]  0.320726768  3.113108227 -0.317984617  0.525258099 -0.737358527
```

```
##  [44,]  0.817880704  0.114519464  0.947138920  0.393118329  3.309604861
##  [45,]  0.098854079 -0.614067984  1.880882222 -2.694984124 -0.306995868
##  [46,]  0.273836056  0.682908754  0.999280311 -3.679276539 -0.947827889
##  [47,]  3.316801733  0.556851144  1.388381393  0.235037843  1.660847705
##  [48,] -0.585426939  0.531189707  1.394925071  1.730707305  0.971538273
##  [49,]  0.037977510  0.996234474  1.627281382  0.423104055 -0.111119080
##  [50,]  1.746457315 -1.363049445  0.198750877 -1.529748758 -0.169782973
##  [51,]  0.472324650 -1.385303922  0.055849946 -0.084832424  0.261419540
##  [52,]  0.033944202 -0.524335952 -0.285422670  1.017897447 -1.018204144
##  [53,]  1.052420453 -0.661963800 -0.035394492  0.302712431  2.372772623
##  [54,] -0.831441151 -0.877698770 -0.546397895  1.390185545  0.946844648
##  [55,]  0.615689183 -0.444107675 -0.265198378  0.510254840  0.201531499
##  [56,] -0.235316020 -0.652678463 -0.537368073  0.593166963  0.355245160
##  [57,] -1.224747095 -0.514821258 -1.028319477  0.142657528  0.376300436
##  [58,] -1.547105438  1.022448246  0.423707563  1.048661978  0.252391501
##  [59,] -1.996247953  0.329406973  0.656566294  0.479608251  1.336151930
##  [60,] -0.888573426  0.777379187  0.748324463  0.678303143  1.264546972
##  [61,] -0.991586846  1.008528156  0.419682504  0.265492410  1.267920507
##  [62,]  0.608899954  0.540666447  1.205836395 -0.430412591  0.551276835
##  [63,] -0.059330517 -0.692031410 -1.135233125  0.450840475 -0.933613372
##  [64,] -0.076628790 -0.378117092 -0.410857929 -0.107170353  0.076531449
##  [65,] -0.528144158  0.180509791 -1.196013083 -0.210145133  0.827216164
##  [66,] -0.495077765 -1.132299154  0.443774781  1.100070701  0.496429020
##  [67,] -0.418333442 -0.906955706 -0.043763793  1.004276644 -0.724550687
##  [68,]  0.247282256 -0.226319962 -0.778797769 -2.159415542  0.481997238
##  [69,] -0.290771040  0.375683190 -1.607327049  0.280078309  1.245733523
##  [70,]  0.737472398 -0.925419250 -0.282240014  0.261912516 -0.048640383
##  [71,]  1.325906114 -0.850428761 -0.231062543  0.329516624 -0.300682241
##  [72,]  1.693660001 -1.715900225  0.841325002  1.251676763  0.043112299
##  [73,]  0.073853853  1.442184649  1.046121562  0.256326281 -1.056676758
##  [74,] -0.443560270  1.744299507  0.190468416 -0.330998302  0.233858108
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##  [79,] -1.483693345  0.873391283  0.560799904 -0.187694105 -0.294625714
##  [80,] -1.213043674 -0.287917267 -0.606757211  1.432224819 -0.726871950
##  [81,] -0.167652388  0.501475184 -1.253948954 -0.963572246  0.273122395
##  [82,] -1.618223239 -0.631902486  1.393905395 -1.095161257 -0.096932704
##  [83,] -0.172970756  0.632568580  1.269952758  0.951569915  0.337198084
##  [84,] -1.272934918 -1.098962025 -0.603752052 -0.313222074  0.430031684
##  [85,] -0.057325963 -0.382326524 -0.630778188 -0.047229842 -0.223337368
##  [86,]  0.329595833 -0.621188818 -0.595729682 -2.679356577  1.375145558
##  [87,]  0.343339187 -1.091042077  0.027867556 -2.235412110 -0.778964828
##  [88,] -1.161607003  0.943644347  1.216492879  0.388245318  0.980232767
##  [89,]  0.351026245 -1.539364667 -0.045067112  0.099932391  1.600829451
##  [90,] -0.612664054  0.121308950 -1.510014582 -0.629353506  0.390149587
##  [91,]  0.891378064  0.152986510 -1.821541567 -0.954690821  1.422333223
##  [92,] -0.007120237  2.439610255 -0.552507920 -0.147594618 -0.632585694
##  [93,] -0.907359135 -0.631587051  1.605212306 -1.123082298  0.170024932
##  [94,] -0.362814967  0.453540838  0.786527729  0.105705454  0.746290042
##  [95,]  0.047467408 -0.098347106  1.614319641 -0.605170059  0.606319781
##  [96,]  0.210087803 -0.176119945  1.800187488 -0.341470466 -0.056962960
##  [97,] -1.449674891 -1.026869047  0.188320229  0.047427676 -0.206864687
```

```
##  [98,]  0.734604887 -1.092518872  1.277767041  0.897181297 -2.919735065
##  [99,]  0.047346792 -0.655435702  0.025425594  0.392397937  1.405406854
## [100,] -0.484170889  0.630020160  1.035363374 -0.440494398  0.742498347
## [101,]  0.764450683 -0.385086086  0.132990558 -0.094467997 -0.731943114
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## [104,] -0.369159977  0.293273204 -1.120620874 -0.304856538  0.197167803
## [105,]  0.011594151 -0.256015108 -0.774903784 -0.366079907 -0.117963213
## [106,] -0.514340223  0.508167011  1.371919914  1.200064932  0.711585738
## [107,]  0.088848387  1.307139440  1.113074005  0.296742902 -1.013006172
## [108,] -0.014637862  0.923797963  1.055023518  1.322165513 -0.535767704
## [109,] -1.062113124 -1.116795717 -0.500250223 -1.606601470  0.363058456
## [110,]  0.183543292 -0.156375843 -2.054976223 -1.325126695 -0.504438659
## [111,]  4.486856453  2.504204521  1.731785541  0.476414408  1.055359723
## [112,] -0.522683691  1.870140942  0.203437052  0.686000501  0.756596294
## [113,] -1.189228414  1.000025531  0.242495526  1.460361193  1.545454435
## [114,] -0.860359260  1.648479175  0.043082165 -0.274997433  1.090892548
## [115,] -0.645062658 -0.385641272  1.508968789 -0.129731055 -0.571770484
## [116,] -0.201659387 -0.662248042  0.112064311  0.753238137 -2.889108706
## [117,]  0.750333067  0.457770685 -1.627171455 -0.353824796  0.957922821
## [118,]  0.252018920  0.983588026 -1.404669876  1.248734035 -1.005714944
## [119,]  1.372576339  0.776319535 -2.187927874 -1.632939474  1.627320479
## [120,]  1.445676557 -0.553673681 -0.328772661  0.705860452  1.464575017
## [121,]  0.857763074 -0.462162550 -1.206208488  0.546841888  0.216438190
## [122,] -0.464642289 -0.101503508 -0.528188859 -0.745098425 -0.944223384
## [123,]  1.530921161 -0.627140101 -0.506811032 -1.311639813 -0.863745148
## [124,] -0.305596734  0.600371785 -1.688002540  0.968928247  0.662936388
## [125,]  1.392195080 -1.240421139  0.155882433 -1.427024083  0.597704758
## [126,] -1.411749129 -0.876155733  0.225509474  0.431866224 -0.532007436
## [127,]  0.265967529 -0.695034275 -0.052171622  1.030470901  0.520175103
## [128,]  0.781796687  0.042512985 -0.883814759  0.370500336 -1.751735670
## [129,] -0.447920950 -0.336047148 -0.458092447  0.002562351 -1.922565629
## [130,] -1.554862142  0.094040493  0.955848698  0.350212361  0.429231682
## [131,]  0.657370224  1.061815595  1.361573226  0.173794524 -1.230335777
## [132,]  0.241211506  1.174697685  0.498711435 -1.374728198  0.539825992
## [133,]  0.112347387 -1.421171631  0.214846957  0.060687846  0.008947872
## [134,] -1.632357529 -0.567896322  0.398492953  0.385490763 -1.092921771
## [135,] -0.972133427 -0.290093883 -0.931110323 -0.072430019  0.984188061
## [136,] -0.476663949 -0.053583552 -1.008822336  0.658603743  0.207475963
## [137,] -1.548190716  0.365500078  0.694071101 -0.374258009  0.623629007
## [138,]  0.711629033  1.258249717  1.003350168  0.065292863 -0.076764690
## [139,] -0.710727191  1.505369060  0.611802257  0.373578668  1.088882115
## [140,] -1.138985348  0.160922677 -1.144560141  0.039844028 -1.068827719
## [141,] -0.185554866  0.412988435 -1.281889365  0.284520960 -0.288878216
## [142,] -0.922193219 -0.056652228 -1.237070052 -0.174162202 -0.231522018
## [143,] -1.195291872 -1.206735922 -0.254628005  0.726320242 -0.109284714
## [144,]  0.158881075 -0.382332862 -0.287736767  1.151385150 -0.591969437
## [145,]  1.269746331 -0.169773636  0.042324501  1.465179641  0.499602156
## [146,]  1.292666217 -1.387800220  0.538734420  0.654069349  0.174672806
## [147,]  0.781608189 -1.653621593  0.372969717  1.433664966  1.556941273
## [148,]  1.171623571 -0.148395187  0.002425926  0.377774306 -0.085732960
## [149,]  1.156557446 -0.661156317 -0.179319580  1.445528328 -1.465280217
## [150,]  0.952316034 -0.518812228 -0.478389729  0.500572055 -1.107708452
## [151,] -0.217362831  0.452904432 -0.929677414 -0.554053549  0.227300639
```

```
## [152,]  1.086441525 -0.306138874 -0.764703029 -1.114878860 -1.790144691
## [153,]  0.574574203  0.723769526 -1.202828172 -1.888856118 -0.063245813
## [154,]  1.272090755 -2.319397986  0.977631891 -2.613092576 -0.116275485
## [155,]  0.478271698 -0.532916105 -0.490780007  0.740346704  1.109572718
##
## $svd$V
##           [,1]       [,2]        [,3]       [,4]       [,5]
## [1,] 0.5509229 -0.2288836  0.01301088  0.1810761  0.7817534
## [2,] 0.1251812  0.7849917  0.55664697 -0.1696952  0.1716549
## [3,] 0.3371073  0.5353463 -0.68498051  0.3305327 -0.1459891
## [4,] 0.5487623 -0.1058755 -0.14063898 -0.7830112 -0.2340180
## [5,] 0.5157831 -0.1832896  0.44832717  0.4648189 -0.5322771
##
##
## $call
## $call$row.w
##   [1] 0.006451613 0.006451613 0.006451613 0.006451613 0.006451613
##   [6] 0.006451613 0.006451613 0.006451613 0.006451613 0.006451613
##  [11] 0.006451613 0.006451613 0.006451613 0.006451613 0.006451613
##  [16] 0.006451613 0.006451613 0.006451613 0.006451613 0.006451613
##  [21] 0.006451613 0.006451613 0.006451613 0.006451613 0.006451613
##  [26] 0.006451613 0.006451613 0.006451613 0.006451613 0.006451613
##  [31] 0.006451613 0.006451613 0.006451613 0.006451613 0.006451613
##  [36] 0.006451613 0.006451613 0.006451613 0.006451613 0.006451613
##  [41] 0.006451613 0.006451613 0.006451613 0.006451613 0.006451613
##  [46] 0.006451613 0.006451613 0.006451613 0.006451613 0.006451613
##  [51] 0.006451613 0.006451613 0.006451613 0.006451613 0.006451613
##  [56] 0.006451613 0.006451613 0.006451613 0.006451613 0.006451613
##  [61] 0.006451613 0.006451613 0.006451613 0.006451613 0.006451613
##  [66] 0.006451613 0.006451613 0.006451613 0.006451613 0.006451613
##  [71] 0.006451613 0.006451613 0.006451613 0.006451613 0.006451613
##  [76] 0.006451613 0.006451613 0.006451613 0.006451613 0.006451613
##  [81] 0.006451613 0.006451613 0.006451613 0.006451613 0.006451613
##  [86] 0.006451613 0.006451613 0.006451613 0.006451613 0.006451613
##  [91] 0.006451613 0.006451613 0.006451613 0.006451613 0.006451613
##  [96] 0.006451613 0.006451613 0.006451613 0.006451613 0.006451613
## [101] 0.006451613 0.006451613 0.006451613 0.006451613 0.006451613
## [106] 0.006451613 0.006451613 0.006451613 0.006451613 0.006451613
## [111] 0.006451613 0.006451613 0.006451613 0.006451613 0.006451613
## [116] 0.006451613 0.006451613 0.006451613 0.006451613 0.006451613
## [121] 0.006451613 0.006451613 0.006451613 0.006451613 0.006451613
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## [151] 0.006451613 0.006451613 0.006451613 0.006451613 0.006451613
##
## $call$col.w
## [1] 1 1 1 1 1
##
## $call$scale.unit
## [1] TRUE
##
```

```
## $call$ncp
## [1] 5
##
## $call$centre
## [1] -2.515349e-17  1.214306e-16 -5.984796e-17 -7.302102e-17  2.335371e-16
##
## $call$ecart.type
## [1] 0.9935274 0.9935274 0.9935274 0.9935274 0.9935274
##
## $call$X
##     Scent.Morph Corolla.Flare_1 Sepal.Length_1 Tube.Length_1 Lobe.Length_1
## 1        Skunky    -0.713960427     0.63464329  -0.474768845   0.214438614
## 2        Skunky    -2.261369617    -0.12064986  -1.959316488  -2.415597625
## 3        Skunky    -0.083400242     2.23160133   1.525300564   0.269891185
## 4        Skunky    -0.424047698    -1.02295872  -0.777104918  -0.007371671
## 5        Skunky     0.300734124    -0.19599541   1.781123396   1.339333632
## 6        Skunky     0.663125035    -0.41651896   1.122185800  -0.086589630
## 7        Skunky    -0.800934245     1.11611971  -0.385618464   0.341187348
## 8        Skunky     0.576151216     2.10847568   1.060168144   1.402707999
## 9        Skunky    -1.362640158     1.20432913   0.261690821  -0.165807589
## 10       Skunky    -1.148829520    -0.54515770   0.850858554   0.309500165
## 11       Skunky    -1.692415887    -1.00458176  -0.311972497  -0.878769220
## 12       Skunky     0.300734124    -0.54515770   0.502009239   1.022461796
## 13       Skunky     0.373212306    -0.54515770  -0.350733533   0.626372001
## 14       Skunky     0.590646853    -0.58191162   0.657053379  -0.324243507
## 15       Skunky     0.554407762    -0.60028858  -0.118167322   0.309500165
## 16       Skunky    -0.895155882    -0.65541947   0.424487169  -0.165807589
## 17       Skunky    -1.101718702     1.05731343  -0.366237947  -0.173729385
## 18       Skunky     0.481929580    -0.49002681   2.129972711  -0.324243507
## 19       Skunky     1.097994128    -0.34301111  -0.234450427   1.101679755
## 20       Skunky    -1.003873156    -0.47164985   1.160946835  -0.799551261
## 21       Skunky    -0.250100061     1.46160660   0.447743790  -0.292556324
## 22       Skunky    -0.953138428     1.67294167   0.459372100   1.093757959
## 23       Skunky    -0.569004062     0.64015638  -0.703458952  -1.037205138
## 25       Skunky    -1.221307702    -0.94945087  -2.598873566  -0.482679425
## 26       Skunky    -0.061656787    -0.63704251  -1.862413900  -0.324243507
## 28       Skunky    -0.282715243     0.77798360  -0.715087262  -0.522288405
## 29       Skunky     0.844320491     0.09803599   2.478822027   1.180897714
## 30       Skunky    -1.366264067    -0.10411060   1.936167536   1.260115673
## 31       Skunky     1.387906857     0.04290510   1.587318221   1.339333632
## 32       Skunky    -1.402503158    -1.44562886  -1.474803549  -1.195641056
## 33       Skunky     0.264495033    -1.07808961  -0.350733533  -0.245025548
## 34       Skunky     1.025515946    -0.80243517  -0.079406287  -0.324243507
## 35       Skunky     1.206711402    -0.21437237   1.703601326   0.864025878
## 36       Skunky    -0.858916791    -1.26185923  -0.350733533  -1.116423097
## 37       Skunky    -1.257546793    -0.65541947   0.385726134  -0.324243507
## 38       Skunky     0.047060486    -1.16997442  -0.660821813  -0.245025548
## 39       Skunky     0.336973215    -1.13322049  -0.893388023  -0.245025548
## 40       Skunky     0.047060486    -0.89431998  -0.001884217  -0.482679425
## 41       Skunky     0.217384215     1.27967468  -0.835246471   1.458160570
## 42       Skunky    -0.119639333     0.82025061  -1.389529272   0.467936083
## 43       Skunky     0.097795214     1.00402024   0.207425372  -0.847082037
## 44       Skunky    -0.713960427     1.02423490  -0.288715876  -0.530210201
## 45       Skunky    -0.779190791     2.37494164   2.300521266  -0.205416569
```

```
## 46       Skunky     2.261268953     1.00402024  -0.284839773  -0.110355018
## 47       Skunky    -0.202989242     0.67139722  -1.955440384   1.315568244
## 48       Skunky    -0.797310336     1.40463802  -0.757724401   2.004764487
## 49       Skunky     3.449911141     1.90632910   1.091176972   2.171122201
## 50       Skunky     0.054308305     0.91581082  -0.540662604  -1.718479586
## 51       Skunky    -0.195741424     1.56451759  -0.277087566  -0.474757629
## 52       Skunky     1.532863222    -0.56353466  -0.311972497   2.369167099
## 55       Skunky     0.844320491    -1.00458176  -0.622060778   0.547154042
## 56       Skunky    -0.206613151    -0.78405821   0.191920958  -0.245025548
## 57       Skunky     2.185166861    -0.15924148   0.036876818   0.467936083
## 58       Skunky     0.119538669    -1.20672834  -0.389494568  -1.354076974
## 59       Skunky     0.771842308    -0.41651896   0.308204064   0.309500165
## 60       Skunky     0.192016851    -0.87594302  -0.079406287  -0.403461466
## 61       Skunky    -0.713960427    -1.13322049  -0.311972497  -0.957987179
## 62       Skunky    -1.293785884     0.67691031  -0.257707048  -2.011586034
## 63       Skunky    -1.054607883     0.29834488  -1.234485132  -2.201709135
## 64       Skunky    -0.250100061     0.89743386  -0.420503396  -1.433294933
## 65       Skunky    -0.442167244     0.95807783  -0.234450427  -1.298624403
## 66       Skunky     0.597894671     1.25027154  -0.234450427   0.436248899
## 67       Skunky    -0.279091334    -1.28023619   0.424487169   0.071846288
## 68       Skunky     0.047060486    -0.50840377  -0.040645252   0.071846288
## 69       Skunky    -0.134134969    -0.41651896   0.424487169  -0.324243507
## 70       Skunky     0.228255942    -0.89431998  -0.970910094  -0.957987179
## 71       Skunky    -0.351569516    -1.04133568  -0.428255603  -0.641115343
## 72       Skunky     0.228255942    -0.23274933  -0.040645252   1.339333632
## 73       Skunky     0.264495033    -0.41651896   0.967141660  -0.403461466
## 74       Skunky     0.844320491    -0.80243517   0.075637853   0.626372001
## 75       Skunky     1.206711402    -0.63704251   0.424487169   1.101679755
## 76       Skunky     2.003971406    -0.83918910  -0.350733533   0.864025878
## 77        Sweet    -0.743519077     1.58503867   0.386671029  -0.208379414
## 78        Sweet    -0.721007373     1.52444069   0.564154798  -0.454870977
## 79        Sweet    -0.859829545     2.34630076   2.323559114  -0.406942062
## 80        Sweet    -0.297036956    -0.76502665   0.328795887  -0.694515553
## 81        Sweet     0.791028716    -0.85971099  -0.983040665   0.401002506
## 82        Sweet     0.033134696     1.06427480  -0.141921935  -0.235767365
## 83        Sweet    -1.602715763     0.70826168  -0.604923070  -1.262815546
## 85        Sweet    -1.122466087    -0.99226907  -0.057038393  -1.516154097
## 86        Sweet    -0.259517450    -0.08329940   0.714630167   0.401002506
## 87        Sweet    -1.351335073    -0.05489410  -2.233143732  -0.879384225
## 88        Sweet    -0.015640662     1.03776318  -0.307830675  -0.893078201
## 89        Sweet    -0.634712509    -1.37100643  -1.021624093  -0.762985431
## 90        Sweet    -0.071919920    -0.65140544   0.135878747   0.127122992
## 91        Sweet     0.753509210    -0.31054182  -0.520039529   1.564990444
## 92        Sweet    -0.071919920    -0.67034231  -0.867290381   1.633460323
## 94        Sweet    -0.679735917     1.21198237  -0.778548496  -1.550389036
## 95        Sweet     1.428860317    -1.08695341  -0.790123525   0.195592870
## 96        Sweet    -0.447114980    -0.63246858   0.483129599  -0.078286644
## 97        Sweet     1.241262787    -0.32947869   1.293381587   1.222641051
## 98        Sweet    -0.919860755     1.72138412   1.737091009  -0.050898693
## 99        Sweet    -0.634712509     0.21211574  -2.024793220  -0.338472183
## 100       Sweet    -0.041904316     0.75371016  -0.435155987  -0.605504710
## 101       Sweet     0.295771238     0.83135132  -1.168241119   0.072347089
## 102       Sweet     0.171956868     0.78969021  -1.125799348   0.154510943
## 103       Sweet    -1.047427075    -1.06801654  -1.407458373  -1.105334825
```

```
## 104       Sweet    -0.372075968    -0.55672110  -0.558622957   0.537942264
## 105       Sweet     0.903587234    -0.42416303  -0.404289245  -0.283696281
## 106       Sweet    -0.248261598     1.05670005  -0.658939870  -0.482258929
## 109       Sweet     0.378314151    -0.17798374   0.135878747   0.811821779
## 110       Sweet    -1.111210235    -0.14011001  -2.291018874  -0.872537237
## 112       Sweet     2.704523519    -1.12482714  -0.944457237   0.811821779
## 113       Sweet    -0.334556462    -0.31054182   0.560296455  -0.078286644
## 114       Sweet    -0.034400414    -0.55672110   0.251629031   0.332532628
## 115       Sweet    -0.064416019     0.92982303  -0.593348042  -1.351826388
## 116       Sweet    -0.672232015     1.50739751   0.282495773  -0.215226402
## 117       Sweet    -0.323300610     1.07753060   0.220762289  -0.831455310
## 118       Sweet    -0.634712509    -1.16270088  -1.253124661   0.058653113
## 119       Sweet    -0.221997944    -0.99226907   0.984714163   1.154171172
## 120       Sweet     3.698790426     3.83095121   2.697818366   2.845377176
## 121       Sweet    -0.454618881     1.56420811   0.757071938  -1.119028801
## 122       Sweet    -0.338308413     0.72719855  -0.006879937  -2.077607102
## 123       Sweet    -0.638464460     1.37673312   0.321079201  -0.920466152
## 124       Sweet    -0.709751521     0.23673367  -1.419033401  -0.530187844
## 125       Sweet    -1.272544110    -0.91652160  -0.134205249  -0.078286644
## 126       Sweet     0.903587234    -0.12117314   1.447715299   0.811821779
## 127       Sweet    -0.372075968    -0.04542567   1.872133007  -0.215226402
## 128       Sweet     1.503899329     0.20075362   1.949299863   1.907339838
## 129       Sweet     2.104211424    -0.27266808   0.637463311   0.743351900
## 130       Sweet     0.978626246    -0.84077412   0.984714163   0.606412142
## 131       Sweet    -0.897349051    -0.44309990  -0.057038393   0.195592870
## 132       Sweet     0.866067728    -0.42416303   0.521713027   2.181219352
## 133       Sweet     0.003119091    -0.40522616   1.331965015  -0.694515553
## 134       Sweet     1.578938341    -0.48097363  -0.442872673   1.907339838
## 135       Sweet    -1.159985593    -0.99226907  -1.214541233  -1.242274582
## 136       Sweet     0.753509210    -0.61353171  -0.057038393  -0.283696281
## 137       Sweet    -0.146958932    -0.46203676   1.177631303   0.811821779
## 138       Sweet    -1.197505099    -0.78396352   0.020128463  -0.009816766
## 139       Sweet    -1.066186828     0.24998947  -1.268558032  -1.653093854
## 140       Sweet    -0.252013549     1.52065331   0.278637431   0.346226603
## 141       Sweet     0.014374943     1.47141746   0.159028804   0.620106118
## 142       Sweet     0.453353163    -1.06801654  -0.867290381   0.195592870
## 143       Sweet    -1.685258676    -0.74608978  -1.214541233  -1.379214340
## 144       Sweet    -0.297036956    -0.76502665  -0.211372105  -0.762985431
## 145       Sweet    -0.221997944    -0.67034231   0.444546171  -0.626045674
## 146       Sweet    -1.122466087     0.45072027  -1.125799348  -1.310744461
## 147       Sweet     0.269507584     1.65321139   0.506279656   0.305144676
## 148       Sweet    -0.398339622     1.48846064   0.116587033  -1.173804704
## 149       Sweet    -1.497661146    -0.74608978   0.290212459  -0.694515553
## 150       Sweet    -0.372075968    -0.36735242   0.984714163  -0.146756523
## 151       Sweet    -0.897349051    -0.82183726   0.213045603  -0.489105917
## 152       Sweet    -0.672232015    -1.44675390  -0.983040665  -1.173804704
## 153       Sweet     0.078158103    -0.61353171   0.328795887  -0.283696281
## 154       Sweet     1.503899329     0.01138494   0.791797023   0.264062749
## 155       Sweet     1.578938341    -0.70821605  -0.327122389   0.811821779
## 156       Sweet     1.954133400    -1.04907967  -0.597206385  -0.146756523
## 157       Sweet     1.016145752     0.04925867   0.598879883   0.811821779
## 158       Sweet     0.603431186    -0.72715292   0.753213595   0.537942264
## 159       Sweet     0.453353163    -0.65140544   0.676046739   0.811821779
## 160       Sweet    -0.259517450    -0.02648880   0.560296455   0.127122992
```

```
## 161       Sweet     0.003119091    -0.48097363   0.753213595   1.838869959
## 162       Sweet     0.040638597     0.33331169   1.023297591   1.496520566
## 163       Sweet     1.278782293    -0.95439533  -1.793292653   2.523568746
## 164       Sweet     1.128704270    -0.55672110   0.290212459  -0.009816766
##     Lobe.Width_1
## 1    -0.62513117
## 2    -1.99960908
## 3    -0.16383379
## 4     1.11650180
## 5     1.30478644
## 6     1.68135573
## 7    -0.49333192
## 8     1.16357296
## 9     0.02445085
## 10   -0.67220233
## 11   -0.38977537
## 12    2.34035199
## 13   -0.29563304
## 14   -1.04877162
## 15   -0.67220233
## 16   -0.38977537
## 17   -0.99228623
## 18    0.17507857
## 19   -0.48391769
## 20   -1.70776788
## 21   -0.03203454
## 22    0.57047632
## 23   -1.18998511
## 25    0.08093625
## 26   -0.10734840
## 28    0.74934674
## 29    0.92821715
## 30   -1.61362556
## 31    1.02235947
## 32   -0.86048698
## 33   -0.67220233
## 34   -0.10734840
## 35    0.83407483
## 36    0.45750554
## 37   -1.51948324
## 38   -0.01320608
## 39   -0.10734840
## 40   -0.48391769
## 41    2.15206734
## 42   -0.88872968
## 43    0.49516247
## 44    0.55164786
## 45   -0.08851993
## 46    0.04327932
## 47    0.22214973
## 48   -0.32387574
## 49    2.55687933
## 50    0.18449280
## 51    0.62696172
```

```
## 52    1.30478644
## 55    0.55164786
## 56    0.64579018
## 57    0.26922089
## 58   -0.57806001
## 59    0.55164786
## 60   -0.20149072
## 61   -1.33119859
## 62   -1.01111470
## 63   -1.65128249
## 64   -0.75693042
## 65   -1.13349971
## 66    0.53281940
## 67    0.08093625
## 68   -0.20149072
## 69   -1.23705627
## 70    0.17507857
## 71    0.36336321
## 72   -0.86048698
## 73   -1.23705627
## 74    0.73993251
## 75    1.30478644
## 76    2.34035199
## 77    0.59506546
## 78   -0.78550884
## 79   -0.05644151
## 80   -0.54507174
## 81    1.47149746
## 82    0.66486978
## 83   -1.07248215
## 85   -0.46751139
## 86   -1.08799422
## 87   -0.89409333
## 88    0.40892061
## 89   -1.24311492
## 90   -0.15726997
## 91   -1.08799422
## 92    0.07541109
## 94   -0.81653298
## 95    0.07541109
## 96   -1.39823563
## 97   -0.77775280
## 98   -0.53731570
## 99   -0.35117085
## 100  -0.27361050
## 101   0.30809215
## 102   0.81223445
## 103  -0.77775280
## 104   2.47978206
## 105  -0.15726997
## 106  -0.46751139
## 109   0.92857498
## 110  -0.51404760
## 112   2.16954064
```

```
## 113  -0.93287351
## 114  -0.31239068
## 115   0.16072748
## 116   0.65711374
## 117   0.78121031
## 118  -1.39823563
## 119  -0.85531315
## 120   3.48806666
## 121  -0.73121659
## 122  -1.08799422
## 123  -1.40599167
## 124   0.30033612
## 125   1.16125604
## 126  -0.54507174
## 127   0.15297144
## 128  -0.93287351
## 129   0.85101463
## 130   0.38565251
## 131  -0.46751139
## 132   1.00613534
## 133  -0.93287351
## 134   0.77345428
## 135  -0.54507174
## 136   0.46321286
## 137   0.92857498
## 138   0.15297144
## 139  -0.89409333
## 140   1.27759657
## 141  -0.42873121
## 142   0.46321286
## 143  -0.54507174
## 144  -1.39823563
## 145  -0.62263209
## 146  -1.32067528
## 147   0.74243013
## 148  -0.84755712
## 149  -1.01043386
## 150  -0.54507174
## 151  -1.16555457
## 152  -0.54507174
## 153   0.61833357
## 154   1.31637675
## 155   1.62661817
## 156   1.00613534
## 157   1.08369569
## 158   1.85929923
## 159   1.16125604
## 160  -0.85531315
## 161   0.85101463
## 162  -0.70019245
## 163   1.08369569
## 164   0.15297144
##
## $call$row.w.init
```

```
##   [1] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
##  [36] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
##  [71] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
## [106] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
## [141] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
##
## $call$call
## PCA(X = X, ncp = ncp, quanti.sup = quanti.sup, quali.sup = 1,
##     graph = FALSE)
##
## $call$quali.sup
## $call$quali.sup$quali.sup
##     Scent.Morph
## 1        Skunky
## 2        Skunky
## 3        Skunky
## 4        Skunky
## 5        Skunky
## 6        Skunky
## 7        Skunky
## 8        Skunky
## 9        Skunky
## 10       Skunky
## 11       Skunky
## 12       Skunky
## 13       Skunky
## 14       Skunky
## 15       Skunky
## 16       Skunky
## 17       Skunky
## 18       Skunky
## 19       Skunky
## 20       Skunky
## 21       Skunky
## 22       Skunky
## 23       Skunky
## 25       Skunky
## 26       Skunky
## 28       Skunky
## 29       Skunky
## 30       Skunky
## 31       Skunky
## 32       Skunky
## 33       Skunky
## 34       Skunky
## 35       Skunky
## 36       Skunky
## 37       Skunky
## 38       Skunky
## 39       Skunky
## 40       Skunky
## 41       Skunky
## 42       Skunky
## 43       Skunky
```

```
## 44       Skunky
## 45       Skunky
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## 102       Sweet
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## 154       Sweet
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## 156       Sweet
## 157       Sweet
## 158       Sweet
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## 159       Sweet
## 160       Sweet
## 161       Sweet
## 162       Sweet
## 163       Sweet
## 164       Sweet
##
## $call$quali.sup$modalite
## [1] 2
##
## $call$quali.sup$nombre
## [1] 72 83
##
## $call$quali.sup$barycentre
##        Corolla.Flare_1 Sepal.Length_1 Tube.Length_1 Lobe.Length_1
## Skunky    3.191891e-16   8.673617e-17  1.396452e-16 -3.833739e-16
## Sweet    -4.093947e-16   8.586881e-17 -2.029626e-16  1.969318e-16
##        Lobe.Width_1
## Skunky 4.510281e-16
## Sweet  1.908196e-17
##
## $call$quali.sup$numero
## [1] 1
##
##
##
## $var.partiel
## $var.partiel$Skunky
##                     Dim.1       Dim.2       Dim.3      Dim.4       Dim.5
## Corolla.Flare_1 0.8113089 -0.25460483  0.02969289  0.1963514  0.47927057
## Sepal.Length_1  0.2189345  0.82396680  0.52287488 -0.2784381  0.06417962
## Tube.Length_1   0.5170592  0.53410681 -0.61835547  0.2497194 -0.14820222
## Lobe.Length_1   0.8277153 -0.01400797 -0.02575279 -0.5069926 -0.22039611
## Lobe.Width_1    0.8074425 -0.18371978  0.35301050  0.2677825 -0.32290985
##
## $var.partiel$Sweet
##                     Dim.1      Dim.2        Dim.3       Dim.4       Dim.5
## Corolla.Flare_1 0.8625369 -0.2378156 -0.004847558  0.03854058  0.46559778
## Sepal.Length_1  0.1661552  0.8551057  0.449993825  0.05682571  0.14097134
## Tube.Length_1   0.5099961  0.6054683 -0.575784331  0.17733985 -0.03156522
## Lobe.Length_1   0.8422602 -0.1932067 -0.207227428 -0.50335491 -0.06679767
## Lobe.Width_1    0.7662248 -0.2066125  0.422334367  0.33146858 -0.32023529
##
##
## $cor.dim.gr
## $cor.dim.gr$Skunky
##             Dim.1       Dim.2       Dim.3       Dim.4       Dim.5
## Dim.1  1.00000000  0.02664424  0.02718582  0.01145267 -0.04303209
## Dim.2  0.02664424  1.00000000  0.01037385 -0.12203672 -0.05470400
## Dim.3  0.02718582  0.01037385  1.00000000 -0.15068339  0.03387399
## Dim.4  0.01145267 -0.12203672 -0.15068339  1.00000000  0.07190758
## Dim.5 -0.04303209 -0.05470400  0.03387399  0.07190758  1.00000000
##
## $cor.dim.gr$Sweet
```

```
##             Dim.1        Dim.2        Dim.3       Dim.4       Dim.5
## Dim.1  1.00000000 -0.021280021 -0.023815741 -0.01122869  0.04044170
## Dim.2 -0.02128002  1.000000000 -0.008448598  0.11123359  0.04779463
## Dim.3 -0.02381574 -0.008448598  1.000000000  0.15064817 -0.03246231
## Dim.4 -0.01122869  0.111233585  0.150648166  1.00000000 -0.07712380
## Dim.5  0.04044170  0.047794626 -0.032462309 -0.07712380  1.00000000
##
##
## $Xc
## $Xc$Skunky
##    Corolla.Flare_1 Sepal.Length_1 Tube.Length_1 Lobe.Length_1 Lobe.Width_1
## 1       -0.71396043     0.63464329  -0.474768845   0.214438614  -0.62513117
## 2       -2.26136962    -0.12064986  -1.959316488  -2.415597625  -1.99960908
## 3       -0.08340024     2.23160133   1.525300564   0.269891185  -0.16383379
## 4       -0.42404770    -1.02295872  -0.777104918  -0.007371671   1.11650180
## 5        0.30073412    -0.19599541   1.781123396   1.339333632   1.30478644
## 6        0.66312504    -0.41651896   1.122185800  -0.086589630   1.68135573
## 7       -0.80093425     1.11611971  -0.385618464   0.341187348  -0.49333192
## 8        0.57615122     2.10847568   1.060168144   1.402707999   1.16357296
## 9       -1.36264016     1.20432913   0.261690821  -0.165807589   0.02445085
## 10      -1.14882952    -0.54515770   0.850858554   0.309500165  -0.67220233
## 11      -1.69241589    -1.00458176  -0.311972497  -0.878769220  -0.38977537
## 12       0.30073412    -0.54515770   0.502009239   1.022461796   2.34035199
## 13       0.37321231    -0.54515770  -0.350733533   0.626372001  -0.29563304
## 14       0.59064685    -0.58191162   0.657053379  -0.324243507  -1.04877162
## 15       0.55440776    -0.60028858  -0.118167322   0.309500165  -0.67220233
## 16      -0.89515588    -0.65541947   0.424487169  -0.165807589  -0.38977537
## 17      -1.10171870     1.05731343  -0.366237947  -0.173729385  -0.99228623
## 18       0.48192958    -0.49002681   2.129972711  -0.324243507   0.17507857
## 19       1.09799413    -0.34301111  -0.234450427   1.101679755  -0.48391769
## 20      -1.00387316    -0.47164985   1.160946835  -0.799551261  -1.70776788
## 21      -0.25010006     1.46160660   0.447743790  -0.292556324  -0.03203454
## 22      -0.95313843     1.67294167   0.459372100   1.093757959   0.57047632
## 23      -0.56900406     0.64015638  -0.703458952  -1.037205138  -1.18998511
## 25      -1.22130770    -0.94945087  -2.598873566  -0.482679425   0.08093625
## 26      -0.06165679    -0.63704251  -1.862413900  -0.324243507  -0.10734840
## 28      -0.28271524     0.77798360  -0.715087262  -0.522288405   0.74934674
## 29       0.84432049     0.09803599   2.478822027   1.180897714   0.92821715
## 30      -1.36626407    -0.10411060   1.936167536   1.260115673  -1.61362556
## 31       1.38790686     0.04290510   1.587318221   1.339333632   1.02235947
## 32      -1.40250316    -1.44562886  -1.474803549  -1.195641056  -0.86048698
## 33       0.26449503    -1.07808961  -0.350733533  -0.245025548  -0.67220233
## 34       1.02551595    -0.80243517  -0.079406287  -0.324243507  -0.10734840
## 35       1.20671140    -0.21437237   1.703601326   0.864025878   0.83407483
## 36      -0.85891679    -1.26185923  -0.350733533  -1.116423097   0.45750554
## 37      -1.25754679    -0.65541947   0.385726134  -0.324243507  -1.51948324
## 38       0.04706049    -1.16997442  -0.660821813  -0.245025548  -0.01320608
## 39       0.33697322    -1.13322049  -0.893388023  -0.245025548  -0.10734840
## 40       0.04706049    -0.89431998  -0.001884217  -0.482679425  -0.48391769
## 41       0.21738421     1.27967468  -0.835246471   1.458160570   2.15206734
## 42      -0.11963933     0.82025061  -1.389529272   0.467936083  -0.88872968
## 43       0.09779521     1.00402024   0.207425372  -0.847082037   0.49516247
## 44      -0.71396043     1.02423490  -0.288715876  -0.530210201   0.55164786
## 45      -0.77919079     2.37494164   2.300521266  -0.205416569  -0.08851993
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## 46      2.26126895     1.00402024  -0.284839773  -0.110355018   0.04327932
## 47     -0.20298924     0.67139722  -1.955440384   1.315568244   0.22214973
## 48     -0.79731034     1.40463802  -0.757724401   2.004764487  -0.32387574
## 49      3.44991114     1.90632910   1.091176972   2.171122201   2.55687933
## 50      0.05430830     0.91581082  -0.540662604  -1.718479586   0.18449280
## 51     -0.19574142     1.56451759  -0.277087566  -0.474757629   0.62696172
## 52      1.53286322    -0.56353466  -0.311972497   2.369167099   1.30478644
## 55      0.84432049    -1.00458176  -0.622060778   0.547154042   0.55164786
## 56     -0.20661315    -0.78405821   0.191920958  -0.245025548   0.64579018
## 57      2.18516686    -0.15924148   0.036876818   0.467936083   0.26922089
## 58      0.11953867    -1.20672834  -0.389494568  -1.354076974  -0.57806001
## 59      0.77184231    -0.41651896   0.308204064   0.309500165   0.55164786
## 60      0.19201685    -0.87594302  -0.079406287  -0.403461466  -0.20149072
## 61     -0.71396043    -1.13322049  -0.311972497  -0.957987179  -1.33119859
## 62     -1.29378588     0.67691031  -0.257707048  -2.011586034  -1.01111470
## 63     -1.05460788     0.29834488  -1.234485132  -2.201709135  -1.65128249
## 64     -0.25010006     0.89743386  -0.420503396  -1.433294933  -0.75693042
## 65     -0.44216724     0.95807783  -0.234450427  -1.298624403  -1.13349971
## 66      0.59789467     1.25027154  -0.234450427   0.436248899   0.53281940
## 67     -0.27909133    -1.28023619   0.424487169   0.071846288   0.08093625
## 68      0.04706049    -0.50840377  -0.040645252   0.071846288  -0.20149072
## 69     -0.13413497    -0.41651896   0.424487169  -0.324243507  -1.23705627
## 70      0.22825594    -0.89431998  -0.970910094  -0.957987179   0.17507857
## 71     -0.35156952    -1.04133568  -0.428255603  -0.641115343   0.36336321
## 72      0.22825594    -0.23274933  -0.040645252   1.339333632  -0.86048698
## 73      0.26449503    -0.41651896   0.967141660  -0.403461466  -1.23705627
## 74      0.84432049    -0.80243517   0.075637853   0.626372001   0.73993251
## 75      1.20671140    -0.63704251   0.424487169   1.101679755   1.30478644
## 76      2.00397141    -0.83918910  -0.350733533   0.864025878   2.34035199
## attr(,"scaled:center")
## Corolla.Flare_1  Sepal.Length_1   Tube.Length_1   Lobe.Length_1
##       1.1570139       1.6166528       1.6204861       0.6909306
##    Lobe.Width_1
##       0.6014028
## attr(,"scaled:scale")
## Corolla.Flare_1  Sepal.Length_1   Tube.Length_1   Lobe.Length_1
##       0.2759451       0.5441596       0.2579910       0.1262340
##    Lobe.Width_1
##       0.1062222
##
## $Xc$Sweet
##     Corolla.Flare_1 Sepal.Length_1 Tube.Length_1 Lobe.Length_1
## 77     -0.743519077     1.58503867   0.386671029  -0.208379414
## 78     -0.721007373     1.52444069   0.564154798  -0.454870977
## 79     -0.859829545     2.34630076   2.323559114  -0.406942062
## 80     -0.297036956    -0.76502665   0.328795887  -0.694515553
## 81      0.791028716    -0.85971099  -0.983040665   0.401002506
## 82      0.033134696     1.06427480  -0.141921935  -0.235767365
## 83     -1.602715763     0.70826168  -0.604923070  -1.262815546
## 85     -1.122466087    -0.99226907  -0.057038393  -1.516154097
## 86     -0.259517450    -0.08329940   0.714630167   0.401002506
## 87     -1.351335073    -0.05489410  -2.233143732  -0.879384225
## 88     -0.015640662     1.03776318  -0.307830675  -0.893078201
## 89     -0.634712509    -1.37100643  -1.021624093  -0.762985431
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## 90    -0.071919920   -0.65140544   0.135878747   0.127122992
## 91     0.753509210   -0.31054182  -0.520039529   1.564990444
## 92    -0.071919920   -0.67034231  -0.867290381   1.633460323
## 94    -0.679735917    1.21198237  -0.778548496  -1.550389036
## 95     1.428860317   -1.08695341  -0.790123525   0.195592870
## 96    -0.447114980   -0.63246858   0.483129599  -0.078286644
## 97     1.241262787   -0.32947869   1.293381587   1.222641051
## 98    -0.919860755    1.72138412   1.737091009  -0.050898693
## 99    -0.634712509    0.21211574  -2.024793220  -0.338472183
## 100   -0.041904316    0.75371016  -0.435155987  -0.605504710
## 101    0.295771238    0.83135132  -1.168241119   0.072347089
## 102    0.171956868    0.78969021  -1.125799348   0.154510943
## 103   -1.047427075   -1.06801654  -1.407458373  -1.105334825
## 104   -0.372075968   -0.55672110  -0.558622957   0.537942264
## 105    0.903587234   -0.42416303  -0.404289245  -0.283696281
## 106   -0.248261598    1.05670005  -0.658939870  -0.482258929
## 109    0.378314151   -0.17798374   0.135878747   0.811821779
## 110   -1.111210235   -0.14011001  -2.291018874  -0.872537237
## 112    2.704523519   -1.12482714  -0.944457237   0.811821779
## 113   -0.334556462   -0.31054182   0.560296455  -0.078286644
## 114   -0.034400414   -0.55672110   0.251629031   0.332532628
## 115   -0.064416019    0.92982303  -0.593348042  -1.351826388
## 116   -0.672232015    1.50739751   0.282495773  -0.215226402
## 117   -0.323300610    1.07753060   0.220762289  -0.831455310
## 118   -0.634712509   -1.16270088  -1.253124661   0.058653113
## 119   -0.221997944   -0.99226907   0.984714163   1.154171172
## 120    3.698790426    3.83095121   2.697818366   2.845377176
## 121   -0.454618881    1.56420811   0.757071938  -1.119028801
## 122   -0.338308413    0.72719855  -0.006879937  -2.077607102
## 123   -0.638464460    1.37673312   0.321079201  -0.920466152
## 124   -0.709751521    0.23673367  -1.419033401  -0.530187844
## 125   -1.272544110   -0.91652160  -0.134205249  -0.078286644
## 126    0.903587234   -0.12117314   1.447715299   0.811821779
## 127   -0.372075968   -0.04542567   1.872133007  -0.215226402
## 128    1.503899329    0.20075362   1.949299863   1.907339838
## 129    2.104211424   -0.27266808   0.637463311   0.743351900
## 130    0.978626246   -0.84077412   0.984714163   0.606412142
## 131   -0.897349051   -0.44309990  -0.057038393   0.195592870
## 132    0.866067728   -0.42416303   0.521713027   2.181219352
## 133    0.003119091   -0.40522616   1.331965015  -0.694515553
## 134    1.578938341   -0.48097363  -0.442872673   1.907339838
## 135   -1.159985593   -0.99226907  -1.214541233  -1.242274582
## 136    0.753509210   -0.61353171  -0.057038393  -0.283696281
## 137   -0.146958932   -0.46203676   1.177631303   0.811821779
## 138   -1.197505099   -0.78396352   0.020128463  -0.009816766
## 139   -1.066186828    0.24998947  -1.268558032  -1.653093854
## 140   -0.252013549    1.52065331   0.278637431   0.346226603
## 141    0.014374943    1.47141746   0.159028804   0.620106118
## 142    0.453353163   -1.06801654  -0.867290381   0.195592870
## 143   -1.685258676   -0.74608978  -1.214541233  -1.379214340
## 144   -0.297036956   -0.76502665  -0.211372105  -0.762985431
## 145   -0.221997944   -0.67034231   0.444546171  -0.626045674
## 146   -1.122466087    0.45072027  -1.125799348  -1.310744461
## 147    0.269507584    1.65321139   0.506279656   0.305144676
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## 148    -0.398339622     1.48846064   0.116587033  -1.173804704
## 149    -1.497661146    -0.74608978   0.290212459  -0.694515553
## 150    -0.372075968    -0.36735242   0.984714163  -0.146756523
## 151    -0.897349051    -0.82183726   0.213045603  -0.489105917
## 152    -0.672232015    -1.44675390  -0.983040665  -1.173804704
## 153     0.078158103    -0.61353171   0.328795887  -0.283696281
## 154     1.503899329     0.01138494   0.791797023   0.264062749
## 155     1.578938341    -0.70821605  -0.327122389   0.811821779
## 156     1.954133400    -1.04907967  -0.597206385  -0.146756523
## 157     1.016145752     0.04925867   0.598879883   0.811821779
## 158     0.603431186    -0.72715292   0.753213595   0.537942264
## 159     0.453353163    -0.65140544   0.676046739   0.811821779
## 160    -0.259517450    -0.02648880   0.560296455   0.127122992
## 161     0.003119091    -0.48097363   0.753213595   1.838869959
## 162     0.040638597     0.33331169   1.023297591   1.496520566
## 163     1.278782293    -0.95439533  -1.793292653   2.523568746
## 164     1.128704270    -0.55672110   0.290212459  -0.009816766
##     Lobe.Width_1
## 77    0.59506546
## 78   -0.78550884
## 79   -0.05644151
## 80   -0.54507174
## 81    1.47149746
## 82    0.66486978
## 83   -1.07248215
## 85   -0.46751139
## 86   -1.08799422
## 87   -0.89409333
## 88    0.40892061
## 89   -1.24311492
## 90   -0.15726997
## 91   -1.08799422
## 92    0.07541109
## 94   -0.81653298
## 95    0.07541109
## 96   -1.39823563
## 97   -0.77775280
## 98   -0.53731570
## 99   -0.35117085
## 100  -0.27361050
## 101   0.30809215
## 102   0.81223445
## 103  -0.77775280
## 104   2.47978206
## 105  -0.15726997
## 106  -0.46751139
## 109   0.92857498
## 110  -0.51404760
## 112   2.16954064
## 113  -0.93287351
## 114  -0.31239068
## 115   0.16072748
## 116   0.65711374
## 117   0.78121031
```

```
## 118  -1.39823563
## 119  -0.85531315
## 120   3.48806666
## 121  -0.73121659
## 122  -1.08799422
## 123  -1.40599167
## 124   0.30033612
## 125   1.16125604
## 126  -0.54507174
## 127   0.15297144
## 128  -0.93287351
## 129   0.85101463
## 130   0.38565251
## 131  -0.46751139
## 132   1.00613534
## 133  -0.93287351
## 134   0.77345428
## 135  -0.54507174
## 136   0.46321286
## 137   0.92857498
## 138   0.15297144
## 139  -0.89409333
## 140   1.27759657
## 141  -0.42873121
## 142   0.46321286
## 143  -0.54507174
## 144  -1.39823563
## 145  -0.62263209
## 146  -1.32067528
## 147   0.74243013
## 148  -0.84755712
## 149  -1.01043386
## 150  -0.54507174
## 151  -1.16555457
## 152  -0.54507174
## 153   0.61833357
## 154   1.31637675
## 155   1.62661817
## 156   1.00613534
## 157   1.08369569
## 158   1.85929923
## 159   1.16125604
## 160  -0.85531315
## 161   0.85101463
## 162  -0.70019245
## 163   1.08369569
## 164   0.15297144
## attr(,"scaled:center")
## Corolla.Flare_1  Sepal.Length_1   Tube.Length_1   Lobe.Length_1
##       1.1891687       1.6239880       1.6347831       0.6714337
##    Lobe.Width_1
##       0.6002771
## attr(,"scaled:scale")
## Corolla.Flare_1  Sepal.Length_1   Tube.Length_1   Lobe.Length_1
```

```
##       0.2665280       0.5280704       0.2591786       0.1460496
##    Lobe.Width_1
##       0.1289319
##
##
## $group
## $group$coord
##           Dim.1    Dim.2     Dim.3     Dim.4     Dim.5
## Skunky 2.308466 1.053027 0.7689370 0.4716885 0.3978812
## Sweet  2.326603 1.227983 0.7453109 0.3650066 0.3350963
##
## $group$coord.n
##            Dim.1     Dim.2     Dim.3     Dim.4     Dim.5
## Skunky 0.9986250 0.4555316 0.3326363 0.2040489 0.1721204
## Sweet  0.9989211 0.5272314 0.3199973 0.1567146 0.1438727
##
## $group$cos2
##           Dim.1    Dim.2    Dim.3    Dim.4    Dim.5
## Skunky 71.46999 14.87154 7.929727 2.983921 2.123164
## Sweet  69.78515 19.44031 7.161323 1.717591 1.447630
##
##
## $Cov
## $Cov$Skunky
##                  Corolla.Flare_1 Sepal.Length_1 Tube.Length_1 Lobe.Length_1
## Corolla.Flare_1     1.000000000   -0.007282429     0.2582782     0.5241062
## Sepal.Length_1     -0.007282429    1.000000000     0.1816034     0.1687980
## Tube.Length_1       0.258278171    0.181603371     1.0000000     0.3369235
## Lobe.Length_1       0.524106237    0.168797968     0.3369235     1.0000000
## Lobe.Width_1        0.597120974    0.111717869     0.1911230     0.5533072
##                  Lobe.Width_1
## Corolla.Flare_1     0.5971210
## Sepal.Length_1      0.1117179
## Tube.Length_1       0.1911230
## Lobe.Length_1       0.5533072
## Lobe.Width_1        1.0000000
##
## $Cov$Sweet
##                  Corolla.Flare_1 Sepal.Length_1 Tube.Length_1 Lobe.Length_1
## Corolla.Flare_1     1.000000000   -0.002193703     0.2736473    0.66916164
## Sepal.Length_1     -0.002193703    1.000000000     0.3260491   -0.06186254
## Tube.Length_1       0.273647313    0.326049104     1.0000000    0.34614213
## Lobe.Length_1       0.669161641   -0.061862540     0.3461421    1.00000000
## Lobe.Width_1        0.592376678    0.103728919     0.1149257    0.50089868
##                  Lobe.Width_1
## Corolla.Flare_1     0.5923767
## Sepal.Length_1      0.1037289
## Tube.Length_1       0.1149257
## Lobe.Length_1       0.5008987
## Lobe.Width_1        1.0000000
##
##
## attr(,"class")
## [1] "DMFA" "list"
```

How to interpret this analysis? I'm still learning how PCA works as well as how multiple factor analysis and the closely related dual-multiple factor analysis work. Curious if your familiarity with PCAs will help with this task.

Resources that I've been using: –CRAN document on DMFA function: https://rdrr.io/cran/FactoMineR/man/DMFA.html#heading-6

–YouTube channel of Francois Husson (who developed the R function and collaborated on multiple books/papers concerning multivariate analyses): https://www.youtube.com/channel/UCyz4M1pwJBNfjMFaUCHCNUQ

–Abdi, H., Williams, L. J., & Valentin, D. (2013). Multiple factor analysis: principal component analysis for multitable and multiblock data sets. Wiley Interdisciplinary reviews: computational statistics, 5(2), 149-179. https://personal.utdallas.edu/~herve/abdi-WiresCS-mfa-2013.pdf

–Lê, S., & Pagès, J. (2010). DMFA: Dual Multiple Factor Analysis. Communications in Statistics - Theory and Methods, 39(3), 483–492. https://doi.org/10.1080/03610920903140114 https://www.tandfonline.com/doi/citedby/10.1080/03610920903140114?scroll=top&needAccess=true