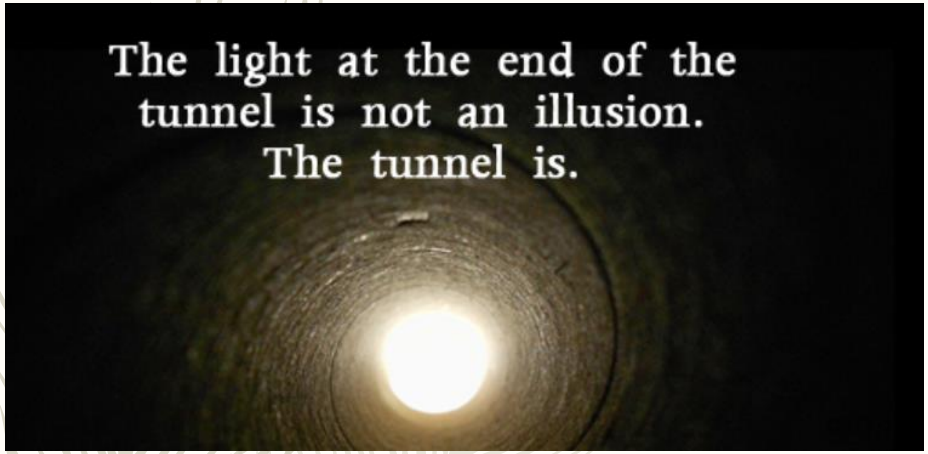
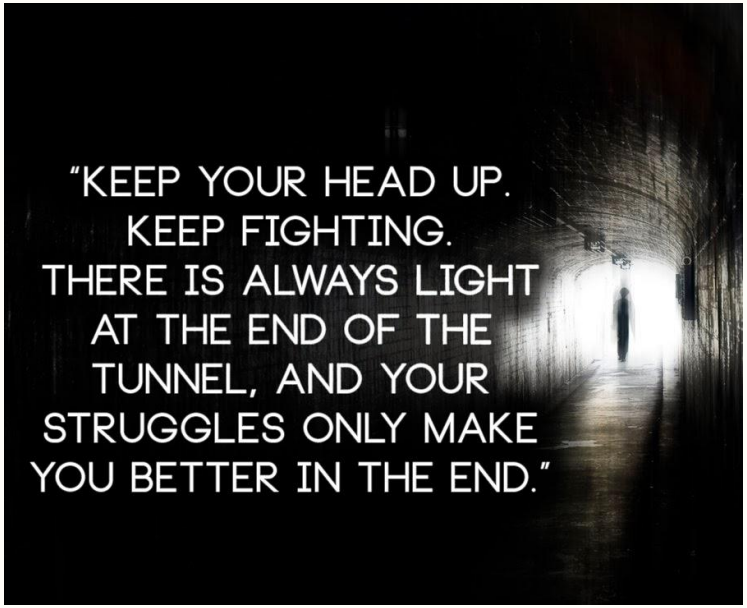
Aula 26 Goodies*

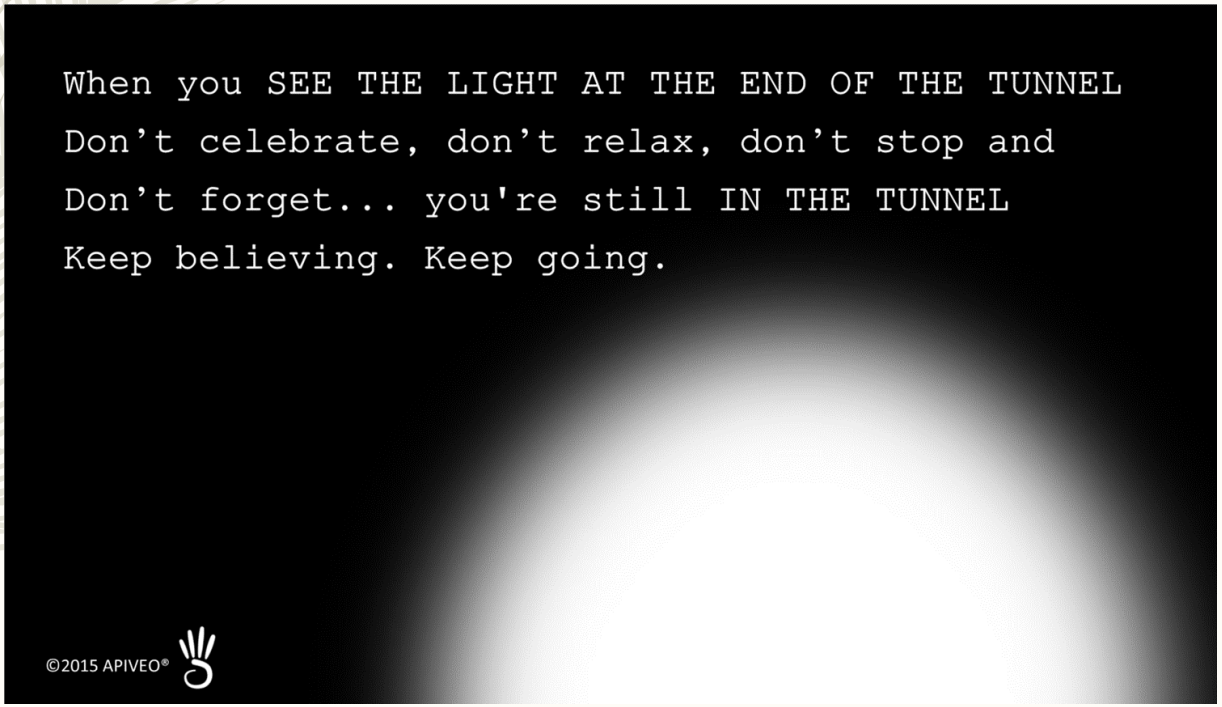
* Goodies related to animals, plants and numbers…

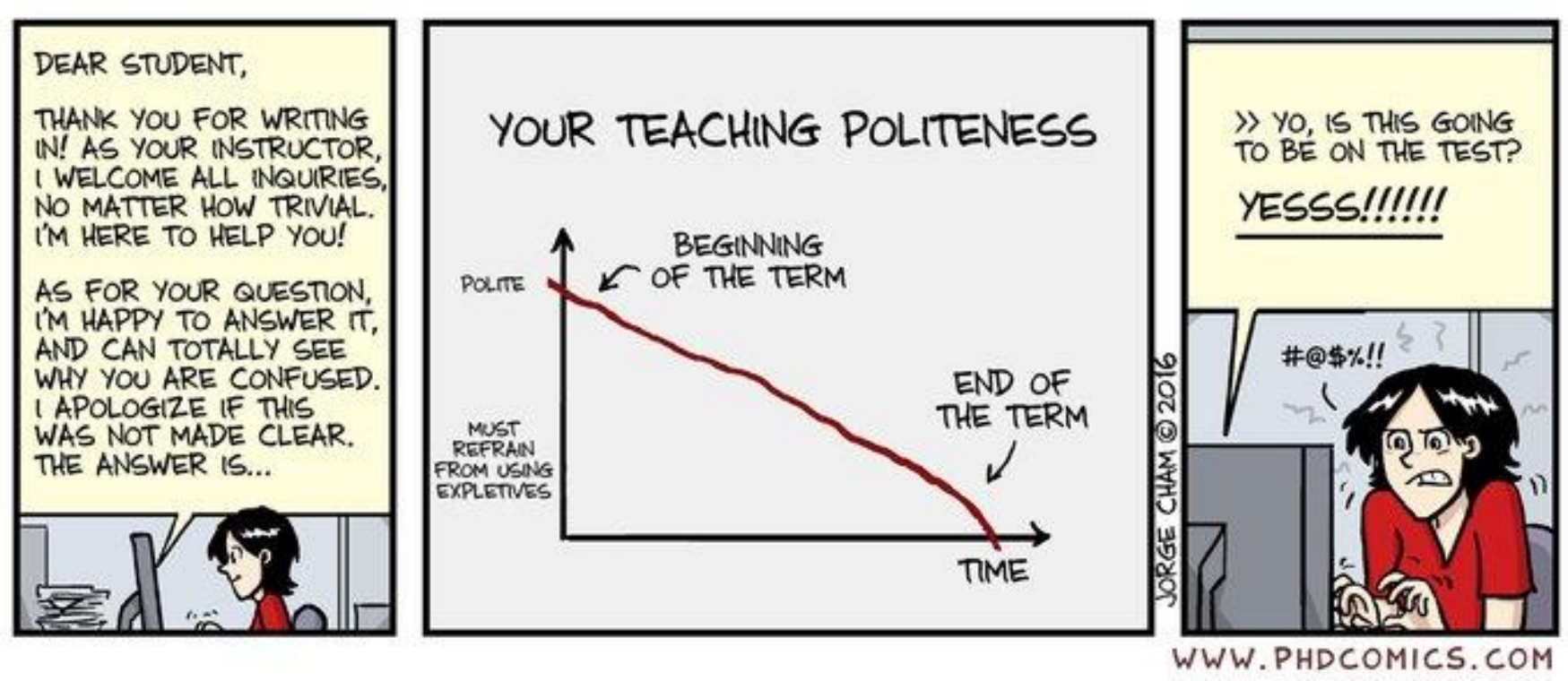
What is this?

Já falta pouco…!








DEAR STUDENT,
THANK YOU FOR WRITING IN! AS YOUR INSTRUCTOR, I WELCOME ALL INQUIRIES, NO MATTER HOW TRIVIAL. I'M HERE TO HELP YOU!
AS FOR YOUR QUESTION, I'M HAPPY TO ANSWER IT, AND CAN TOTALLY SEE WHY YOU ARE CONFUSED. I APOLOGIZE IF THIS WAS NOT MADE CLEAR. THE ANSWER IS...
YOUR TEACHING POLITENESS
POLITE
MUST REFRAIN FROM USING EXPLETIVES
BEGINNING OF THE TERM
END OF THE TERM
TIME
>> YO, IS THIS GOING TO BE ON THE TEST?
YESSS!!!!!!
#@$%!!
JORGE CHAM © 2016
WWW.PHDCOMICS.COM

PROCEEDINGS
OF THE ROYAL SOCIETY B

BIOLOGICAL SCIENCES

Open Access

Check for updates

View PDF

Tools Share

Research article

Bottlenose dolphins can understand their partner's role in a cooperative task

Kelly Jaakkola, Emily Guarino, Katy Donegan and Stephanie L. King

Published: 19 September 2018 https://doi.org/10.1098/rspb.2018.0948

Together for Science and Conservation

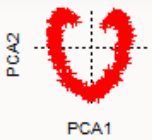
WMMC'19
World Marine Mammal Conference
Barcelona 2019

Hosted by

Conference Organizers

submon
building a sustainable marine future

UNIVERSITAT DE BARCELONA

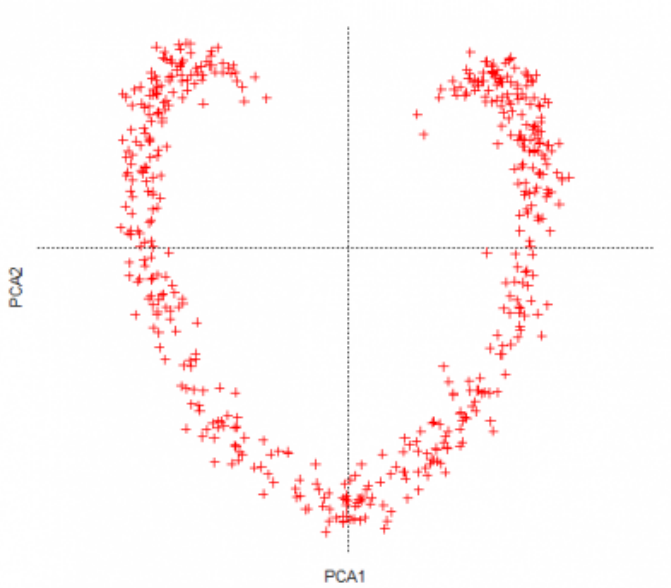


Analysis of community ecology data in R
David Zelený

Analysis of community ecology data in R

David Zelený

Introduction

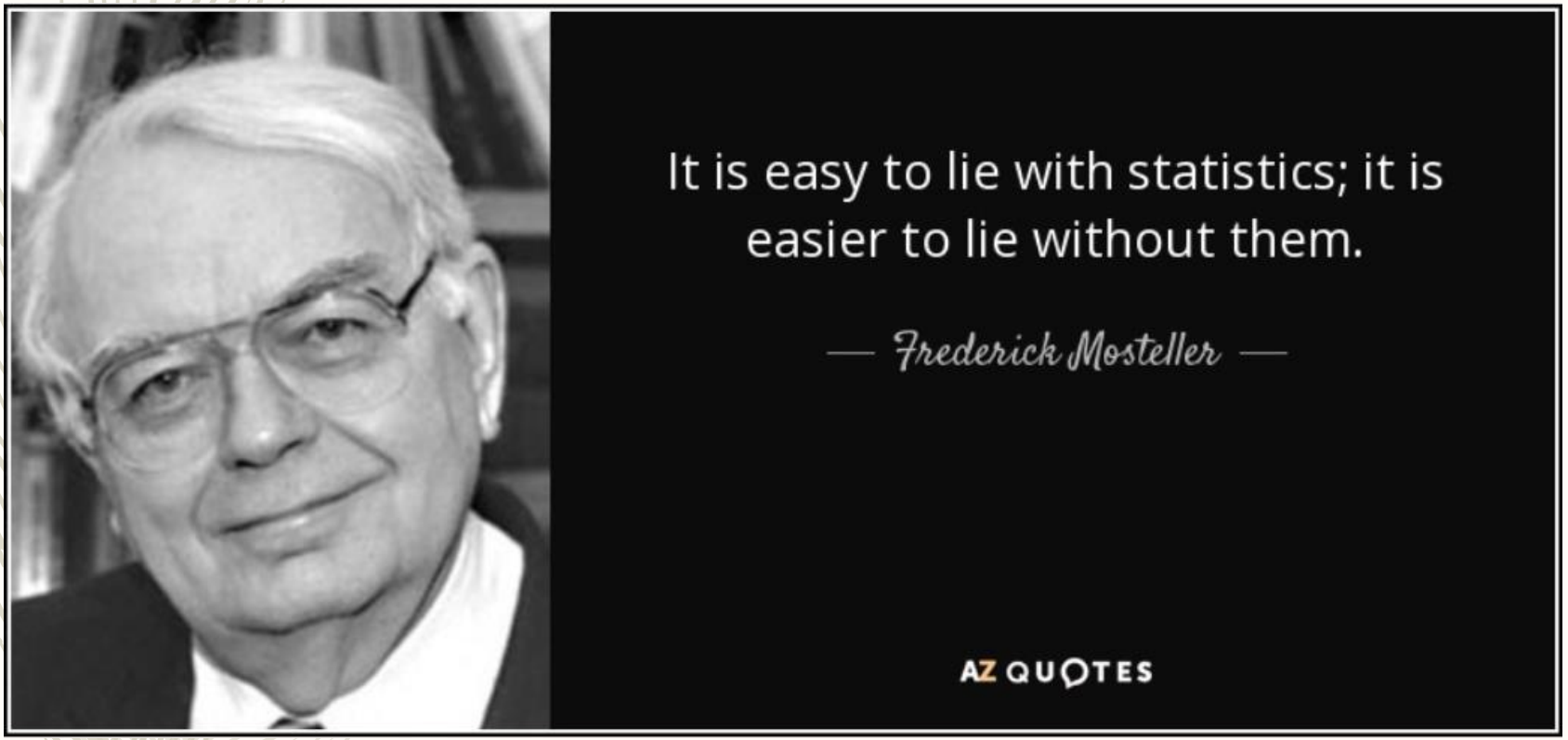


This website is focused on an analysis of multivariate community ecology data, i.e. data with many descriptors (usually species) and samples (usually plots/sites/traps etc). Since I am vegetation ecologist, the website descriptions, and elaborated examples are heavily biased toward analysis of vegetation data; still, I think that also other ecological fields (e.g. zoologists or microbiologists) may find the website useful. The aim is *not* a comprehensive on-line source of information about multivariate analysis (there are much more useful websites for this, see Links to other study materials). I focus mostly on preparing useful working examples of analyses with real datasets and elaborated solutions of individual exercises. The secondary aim of the website is to provide insight into the theoretical background of established methods and links to recent developments in multivariate analysis and analysis of diversity. This is not to say that I try to keep pace with all the new and fancy analytical methods, more likely just those I found useful, promising or interesting (in my purely subjective and desperately biased view).

From time to time, I use this website as teaching materials for my class Numerical Methods in Community Ecology or some of the R workshops. For that reason, parts of the website are locked, namely those with class exercises and their solutions. Also, the website is constantly under construction, with major development and changes done during or before the semester when I teach some of the classes. In the remaining time, the website could serve as a source of on-line information about different aspects of community data analysis in R.

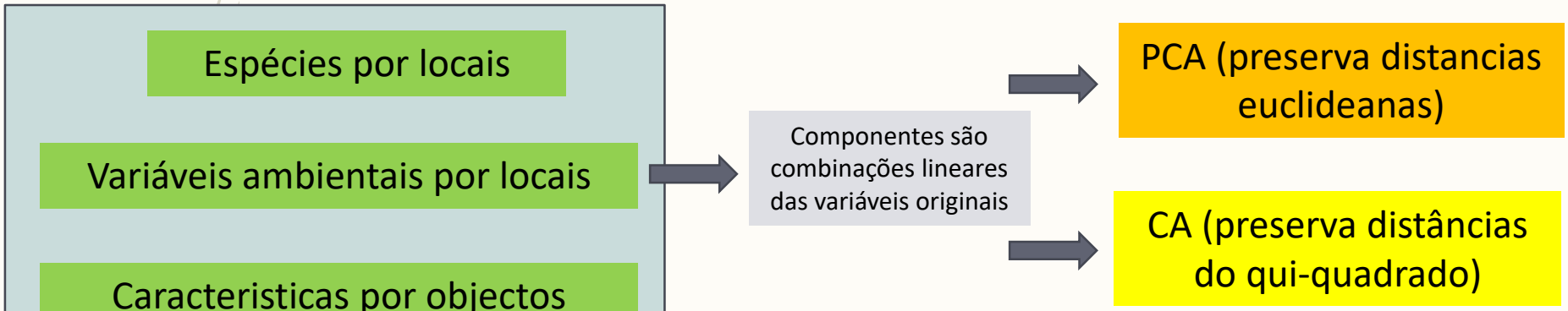
How to use this website

Ecologia Numérica - Aula Teórica 26 – 16-12-2018

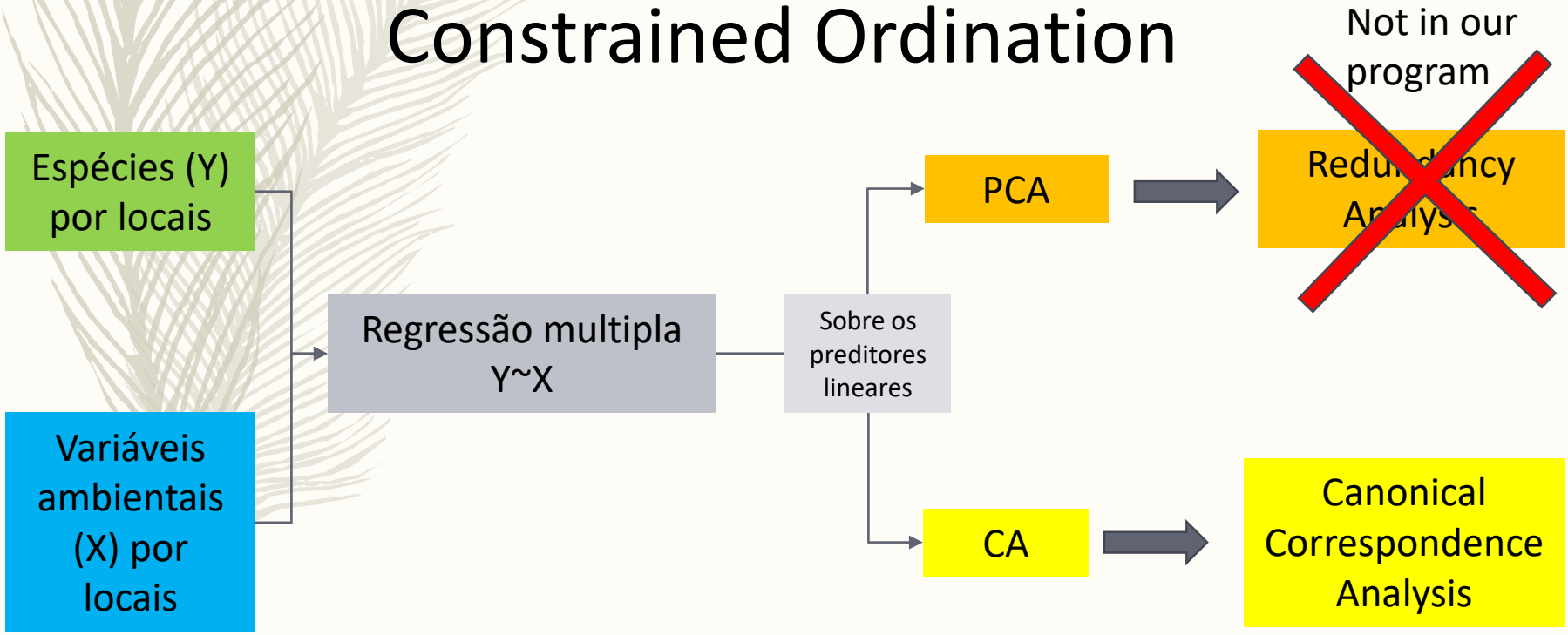


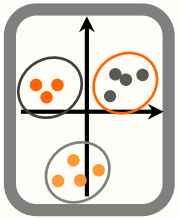
https://www.azquotes.com/quote/819974

Unconstrained Ordination



Constrained Ordination

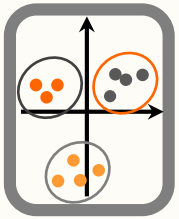




Análise canónica de correspondências (CCA)

- Modificação da CA, na qual os eixos são extraídos não só tendo em conta a maximização da inércia (variância) explicada, mas também de modo a que a sua correlação com outro conjunto de variáveis (usualmente variáveis ambientais) seja também maximizada;

- A CCA utiliza também o algoritmo de *reciprocal averaging*.

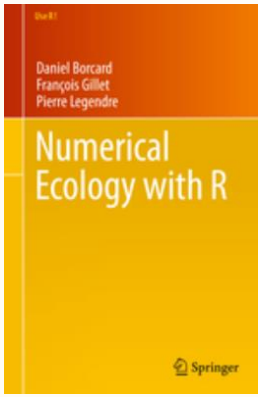


Análise canónica de correspondências (CCA)

- Ambas as análises, CA e CCA, maximizam a dispersão dos pontos ao longo dos eixos;

- A principal diferença reside no facto que numa CA esta dispersão é independente de outra matriz com variáveis ambientais, enquanto que na CCA os eixos são uma função desta matriz.

CCA shares the basic properties of CA, combined with those of a constrained ordination.



It preserves the χ^2 *distance* among sites, and species are represented as points in the triplots.

ter Braak (1986) has shown that, provided that some conditions are fulfilled, CCA is a good approximation of a multivariate Gaussian regression.

One particularly attractive feature of a CCA triplot is that species are ordered along the canonical axes following their ecological optima.

This allows a relatively easy ecological interpretation of species assemblages. Also, species scores can be used as synthetic descriptors in a clustering procedure (for instance *k*-means partitioning) to produce a typology of the species in assemblages.

Análise canónica de correspondências (CCA)

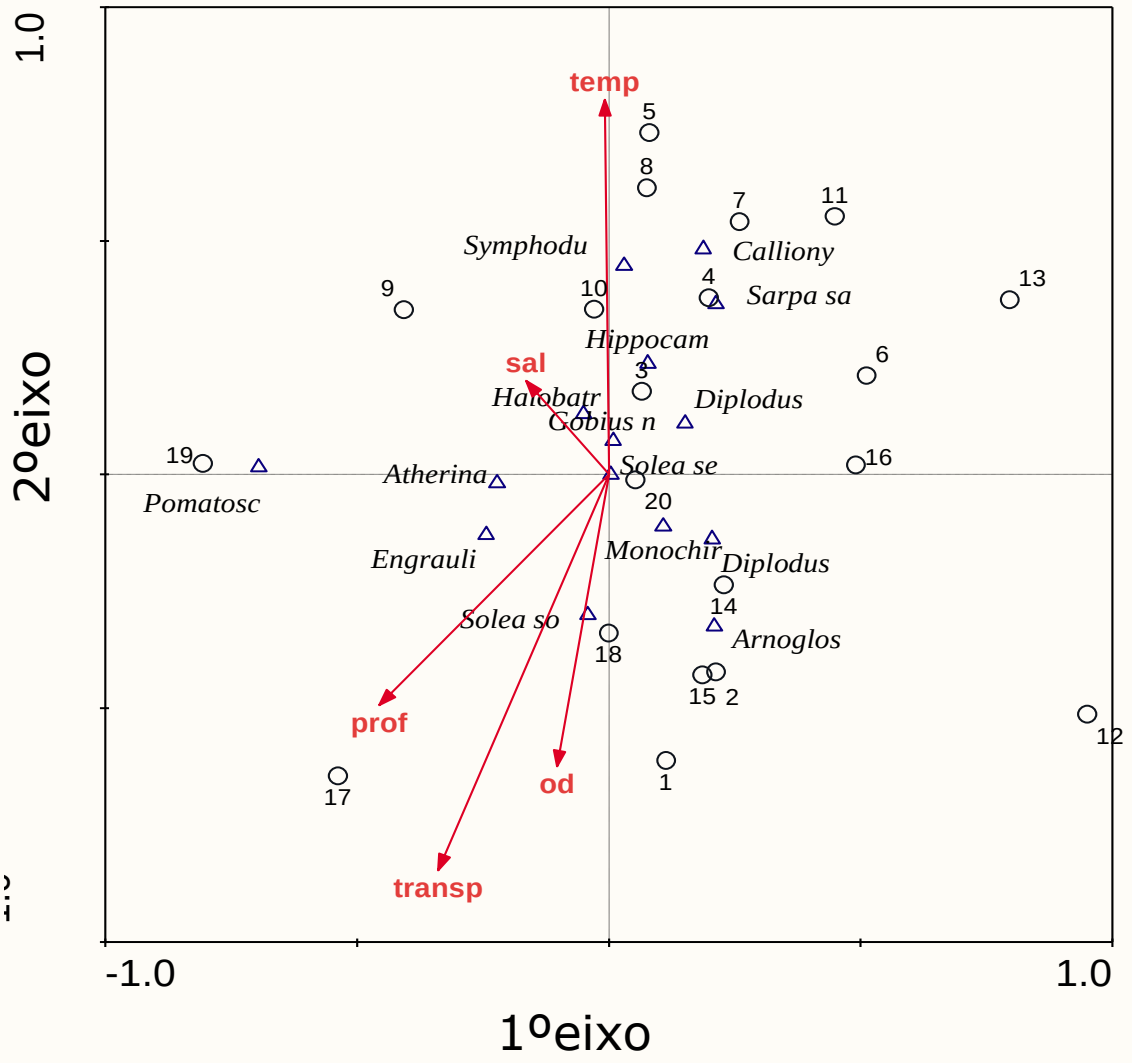


Diagrama de Ordenação (CCA)

Análise canónica de correspondências (CCA)

```
cca.aves<-cca(aves[,-1]~., data=avesamb[,-1])
summary(cca.aves)
```

```
##
## Call:
## cca(formula = aves[, -1] ~ Perc.veg + Agua + Solo, data = avesamb[,      -1])
##
## Partitioning of scaled Chi-square:
##               Inertia Proportion
## Total          0.7634     1.0000
## Constrained    0.3587     0.4699
## Unconstrained  0.4047     0.5301
##
## Eigenvalues, and their contribution to the scaled Chi-square
##
## Importance of components:
##                          CCA1     CCA2      CCA3     CA1     CA2     CA3
## Eigenvalue             0.3280 0.02924 0.001425 0.1688 0.08045 0.05299
## Proportion Explained   0.4297 0.03830 0.001866 0.2211 0.10539 0.06941
## Cumulative Proportion  0.4297 0.46802 0.469886 0.6910 0.79640 0.86581
##                            CA4     CA5     CA6     CA7      CA8      CA9
## Eigenvalue             0.03458 0.03081 0.01695 0.01137 0.007464 0.001256
## Proportion Explained   0.04530 0.04037 0.02221 0.01489 0.009778 0.001646
```

Da variação total nas abundancias, quanta é explicada por cada componente, primeiro em função das variáveis ambientais, e depois nos eixos não-*constrained*

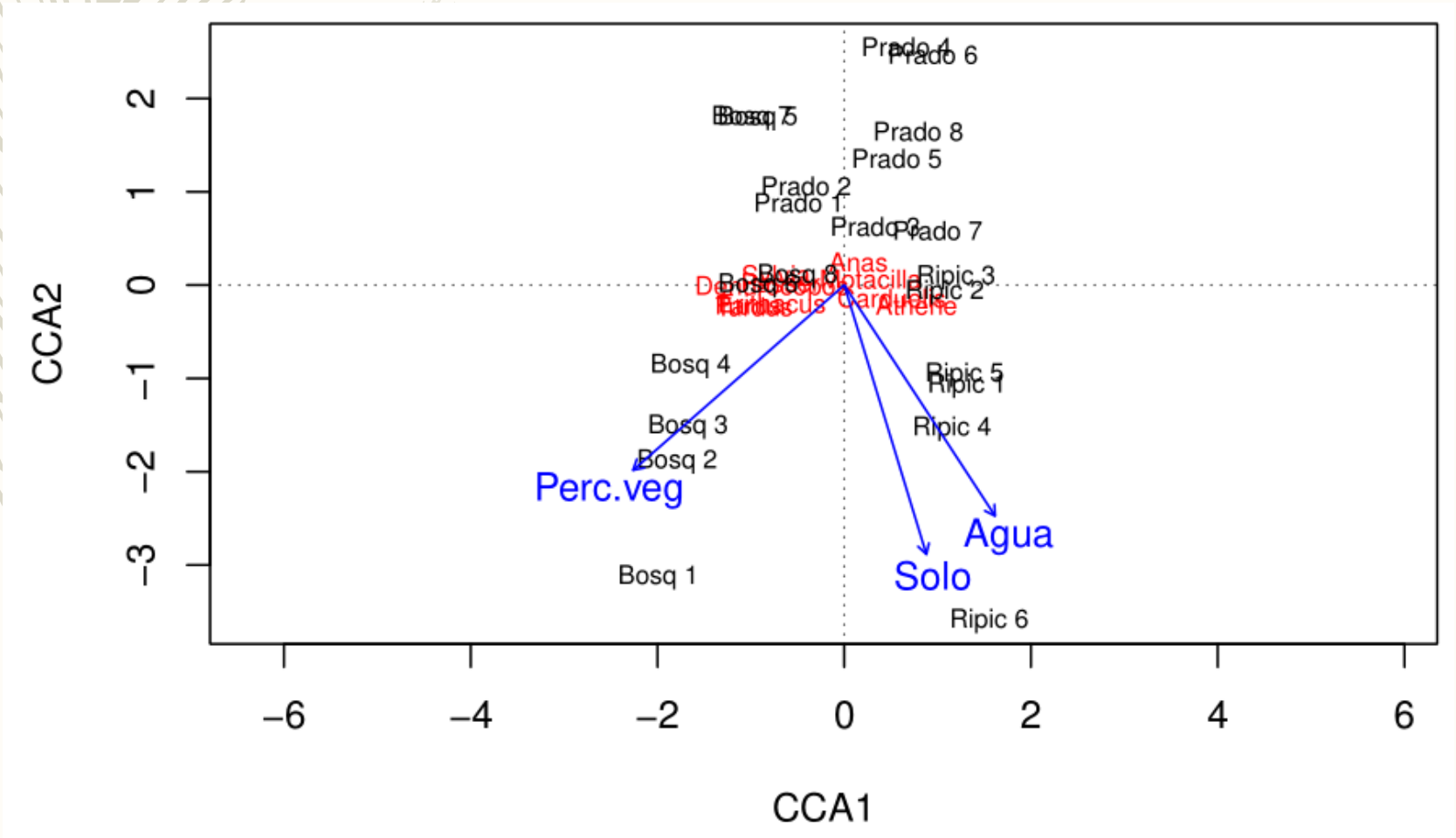
```
## Cumulative Proportion 0.91111 0.95148 0.97368 0.98858 0.998354 1.000000
##
## Accumulated constrained eigenvalues
## Importance of components:
##                          CCA1    CCA2     CCA3
## Eigenvalue             0.3280 0.02924 0.001425
## Proportion Explained   0.9145 0.08152 0.003972
## Cumulative Proportion  0.9145 0.99603 1.000000
##
## Scaling 2 for species and site scores
## * Species are scaled proportional to eigenvalues
## * Sites are unscaled: weighted dispersion equal on all dimensions
##
##
## Species scores
##
##                CCA1     CCA2      CCA3      CA1       CA2      CA3
## Erithacus   -0.7768 -0.19685 -0.065959  0.18436 -0.077779  0.24382
## Turdus      -0.9648 -0.23347 -0.002096 -1.24513  0.026119  0.10185
## Passer      -0.6850  0.02306  0.113574 -0.95215 -0.142186 -0.92793
## Parus       -1.0307 -0.21659 -0.029620 -1.20241  0.033001  0.55886
## Athene       0.7737 -0.22104 -0.123545  0.06307 -0.227752  0.37841
## Anas         0.1512  0.24331 -0.011338  0.13870 -0.189073 -0.14366
## Sylvia      -0.7323  0.08601 -0.011922  0.35166  0.873994  0.09333
## Carduelis    0.5073 -0.13729  0.031330  0.23570 -0.106902  0.06677
## Motacilla    0.2809  0.06105  0.017772  0.07177  0.002034  0.18827
## Dendrocopos -0.7739 -0.03457  0.011154 -0.32177  0.184739 -0.35045
```

Da variação nas abundancias que pode ser explicada pelas variáveis ambientais, quanta é explicada por cada componente?

```
## Site constraints (linear combinations of constraining variables)
##
##              CCA1     CCA2       CCA3      CA1        CA2      CA3
## Bosq 1   -1.31648 -0.24662 -0.2960733 -1.69906  0.3412784  3.09366
## Bosq 2   -1.66810 -0.43045 -0.1310699 -1.45636 -1.6684158 -0.61482
## Bosq 3   -0.65583 -0.47859  1.0734735 -1.83093  0.4307769 -0.96136
## Bosq 4   -0.50655 -0.09351 -0.3818036 -1.65590  0.8319174 -0.71830
## Bosq 5   -0.57171 -0.19692 -0.3174287 -0.36205 -0.0350761 -1.66804
## Bosq 6   -1.52015 -0.70390 -0.9236776  1.26653 -0.7150326 -0.64443
## Bosq 7   -1.38010 -0.66702 -0.3701555  1.99500  1.8709653  0.41297
## Bosq 8   -1.51834 -0.80233  0.8309498  1.85373 -0.1426594  0.08602
## Prado 1   0.23409  1.44511  0.1563554  0.06650  2.6371451  0.02591
## Prado 2   0.26899  1.37955  0.3271438 -0.23050  1.3348065 -1.39378
## Prado 3   0.24667  1.37789 -0.2362737 -0.13035 -0.1440932  1.23049
## Prado 4  -0.04446  1.29317 -0.8153716  0.55476 -1.3515627 -0.33915
## Prado 5   0.28423  1.09568  0.6085555  0.46104 -0.3868010  0.06131
## Prado 6   0.47614  1.02432  0.0006532  0.36616 -1.0540694 -0.03454
## Prado 7   0.46977  1.01766  1.2083258  0.35392 -1.1336281 -0.06426
## Prado 8   0.36439  1.41311 -0.2461690  0.27631 -0.8460425  0.70205
## Ripic 1   1.32532 -1.11375  0.3241837 -0.03093  0.0005633  0.05120
## Ripic 2   1.23941 -1.05818  0.2342329 -0.22769  0.1093549  0.01896
## Ripic 3   1.21733 -1.31891  1.0163511  0.04955 -0.1143608 -0.24653
## Ripic 4   1.03051 -1.18296  1.9005736  0.35968 -0.1316139  0.07247
## Ripic 5   1.48182 -0.84024 -3.4193528 -0.11797  0.1860379 -0.67368
## Ripic 6   1.03817 -0.99541 -0.5173174  0.22163 -0.1628344  1.52354
```

```
## Biplot scores for constraining variables
##
##              CCA1    CCA2     CCA3 CA1 CA2 CA3
## Perc.veg -0.7484 -0.6559 -0.09883   0   0   0
## Agua      0.5344 -0.8183 -0.21145   0   0   0
## Solo      0.2911 -0.9544  0.06580   0   0   0
```

```
plot(cca.aves)
```



Análise canónica de correspondências (CCA)