

Using partial bootstrap to evaluate the uncertainty associated with TCATA trajectories

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Must
25.9 °Bx

6
fermenters

4
fermenters

21 °Bx

Musts

27 °Bx

21
°Bx

Musts

27
°Bx



~10.5%
ethanol
v/v

Wines



~15.5%
ethanol
v/v

~10.5%
ethanol
v/v

“low”



~10.5%
ethanol
v/v

“low”

~15.5%
ethanol
v/v

“high”



~15.5%
ethanol
v/v

“low-to-high”

~15.5%
ethanol
v/v

“high”

3 wine treatments

Low

~10.5%
ethanol
v/v

“low”

Adjusted

~15.5%
ethanol
v/v

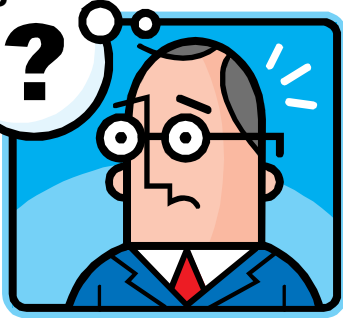
“low-to-high”

High

~15.5%
ethanol
v/v

“high”

How do flavours evolve
in the finish of these
wines



3 wine treatments

Low

~10.5%
ethanol
v/v

“low”

Adjusted

~15.5%
ethanol
v/v

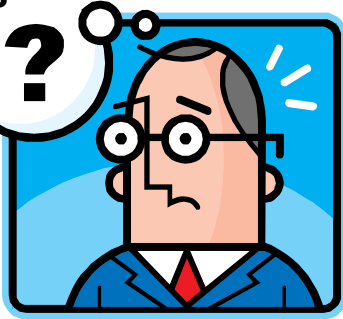
“low-to-high”

High

~15.5%
ethanol
v/v

“high”

How do flavours evolve
in the finish of these
wines



Temporal Check All That Apply (TCATA)

Temporal Check-All-That-Apply (TCATA)

Check and uncheck words to track changes in the wine.
(Check *all* that apply. Uncheck all that *do not* apply.)



0:00

Heat

Sour

Earthy

Other

Astringent

Bitter

Red Fruit

Spices

Green

Dark Fruit

Temporal Check-All-That-Apply (TCATA)

Check and uncheck words to track changes in the wine.

(Check *all* that apply. Uncheck all that *do not* apply.)



0:10

Expectorate now

Heat

Sour

Earthy

Other

Astringent

Bitter

Red Fruit

Spices

Green

Dark Fruit

TCATA raw data

Astringent

Bitter

Dark Fruit

Earthy

Green

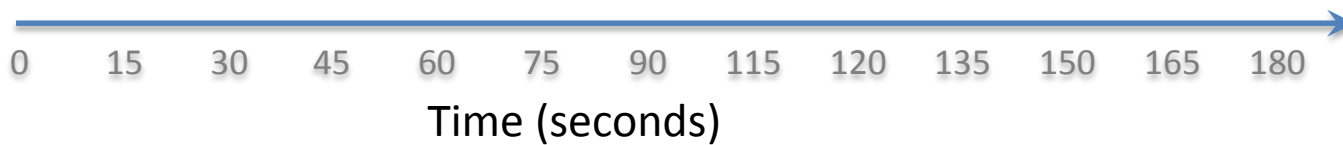
Heat

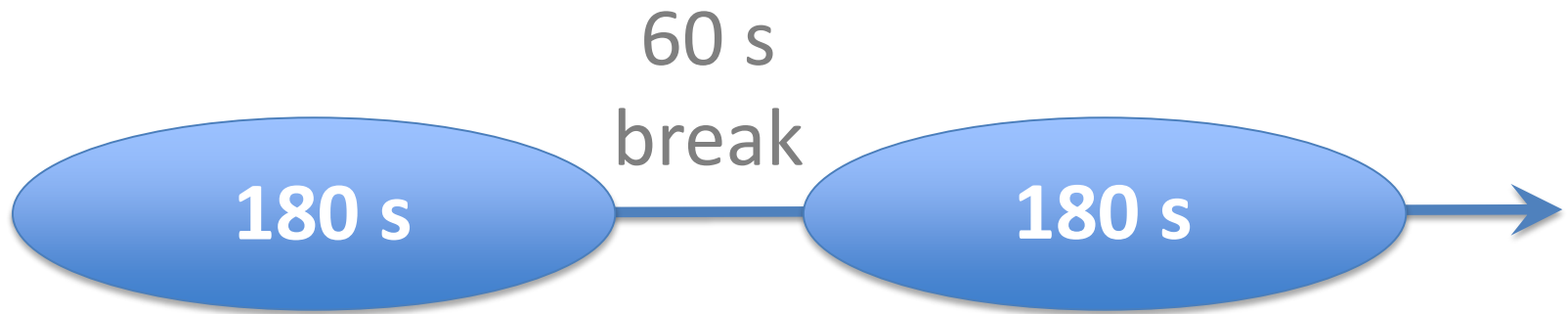
Other

Red Fruit

Sour

Spices





Sip 1
evaluation

Sip 2
evaluation

$n = 13$
(x4 replicates)



WineSips

High ethanol

Sip 1

H1

Sip 2

H2

Low ethanol

Sip 1

L1

Sip 2

L2

Adjusted (Low-to-High) ethanol

Sip 1

A1

Sip 2

A2

Exploratory data analysis (multivariate)

Citation proportions in multi-way array



Matrix

Exploratory data analysis (multivariate)

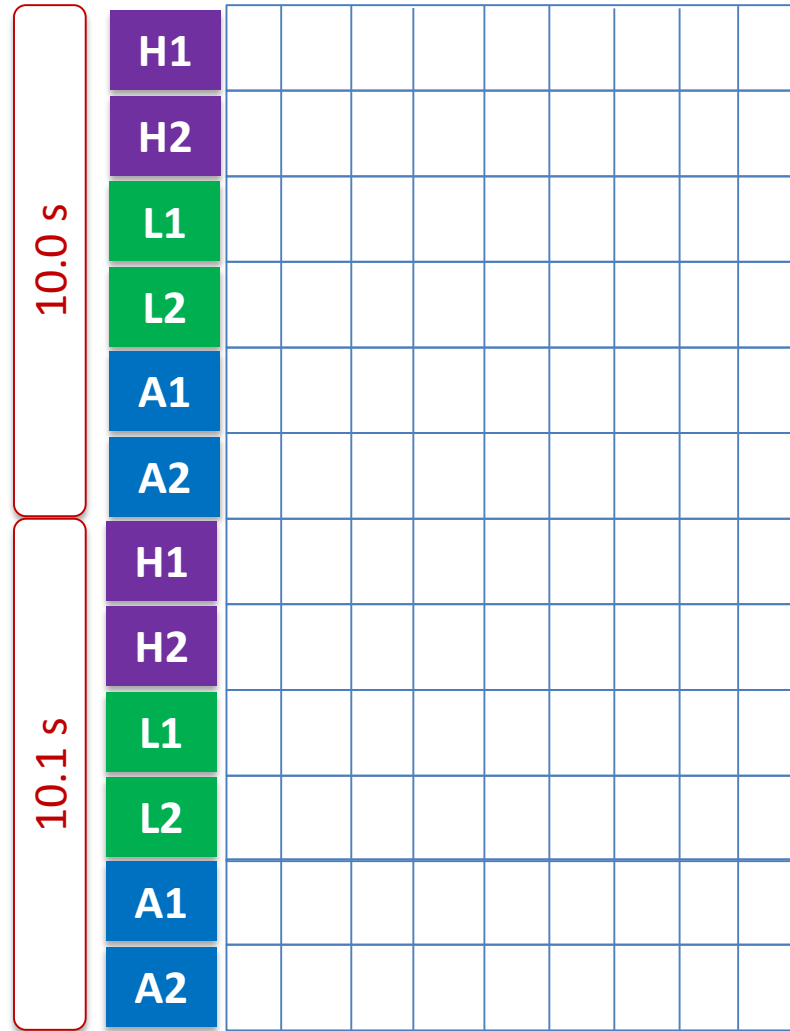
Citation proportions in multi-way array



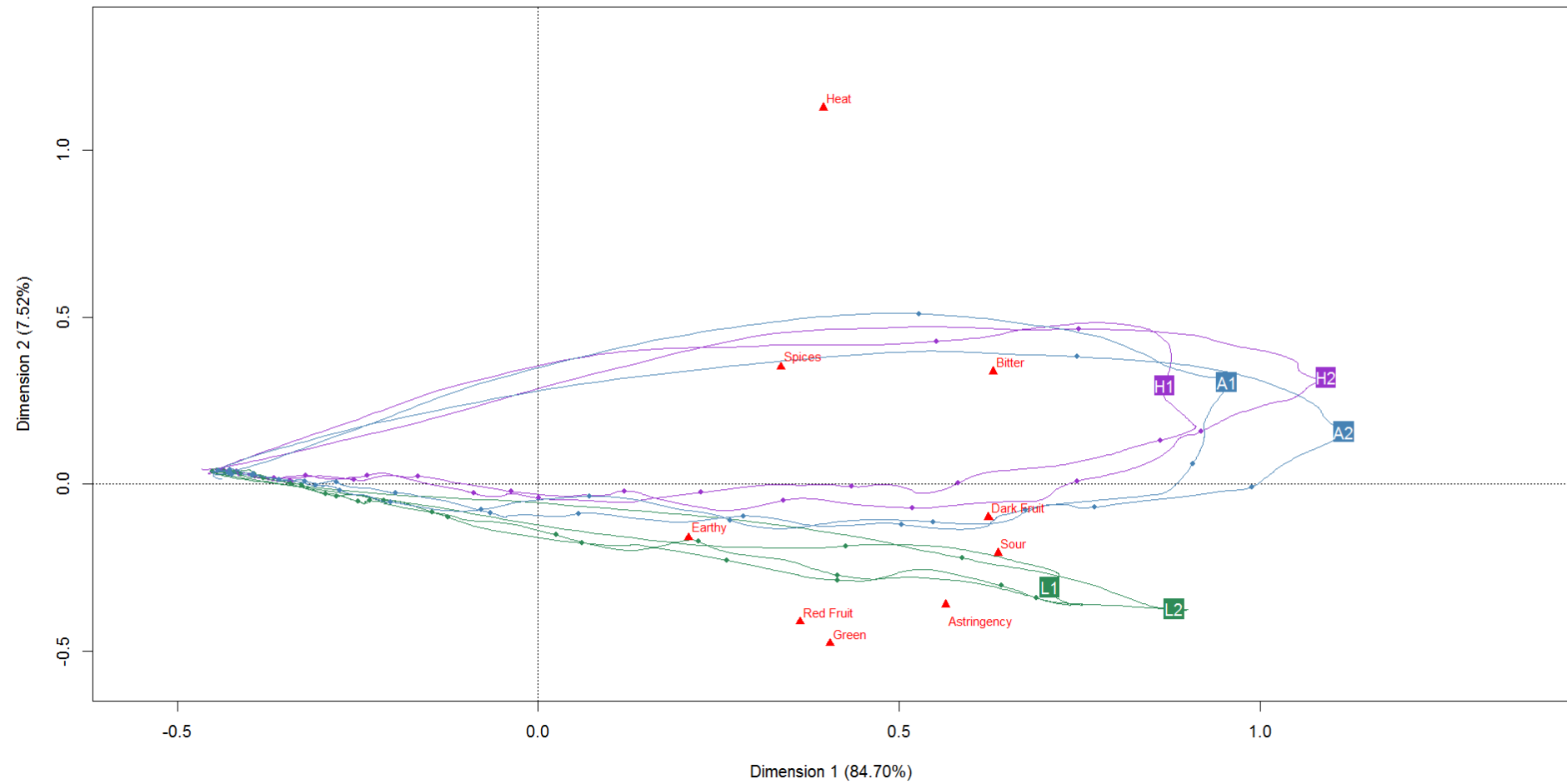
Matrix

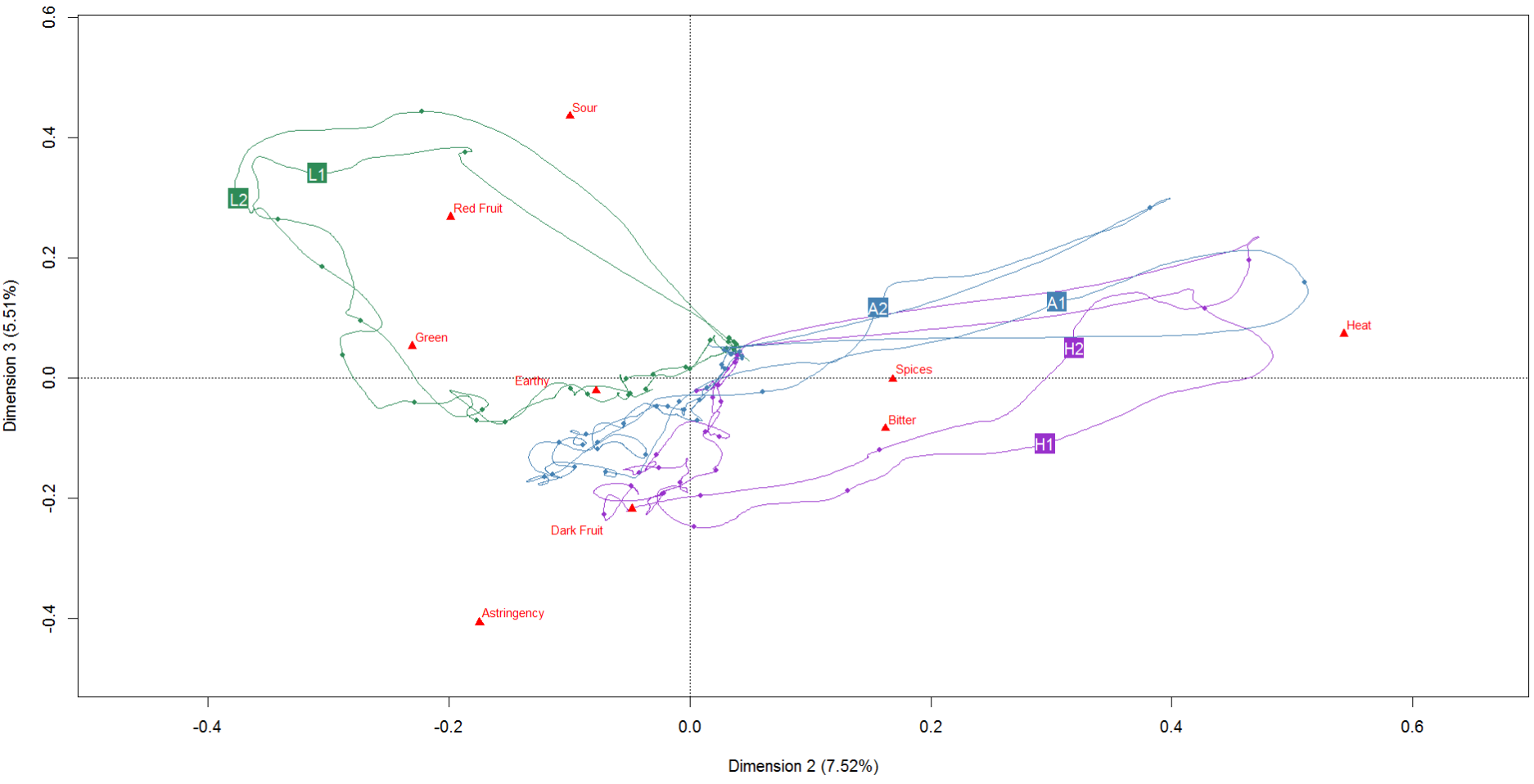
Columns: Attributes

Rows: WineSips
x
Times



.....



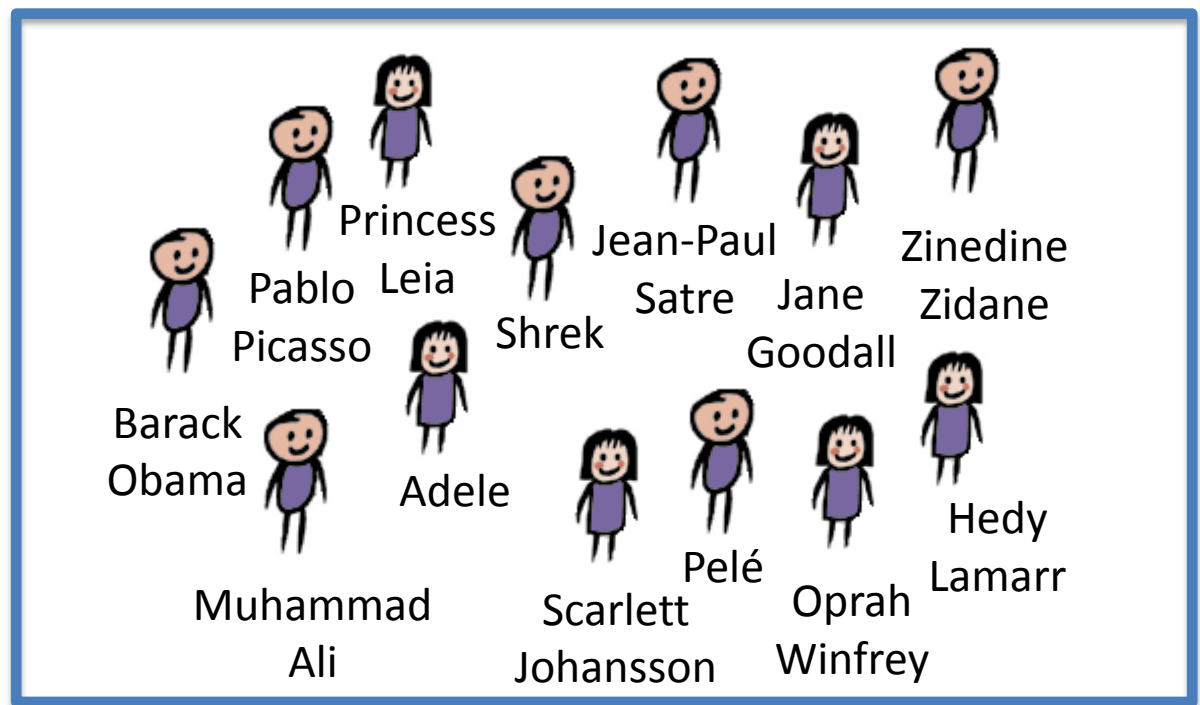


How well do these trajectories
represent the evolution of flavours in
the WineSips?

Data resampling

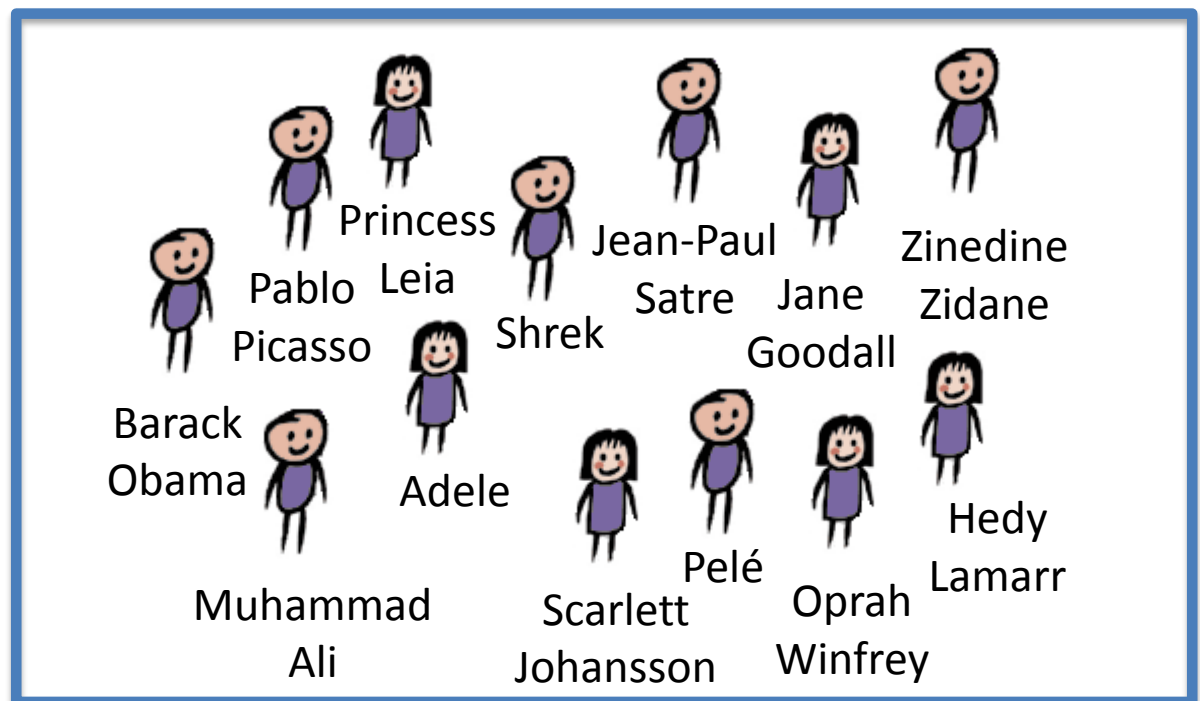
The Real Panel

(n=13)



The Real Panel

(n=13)



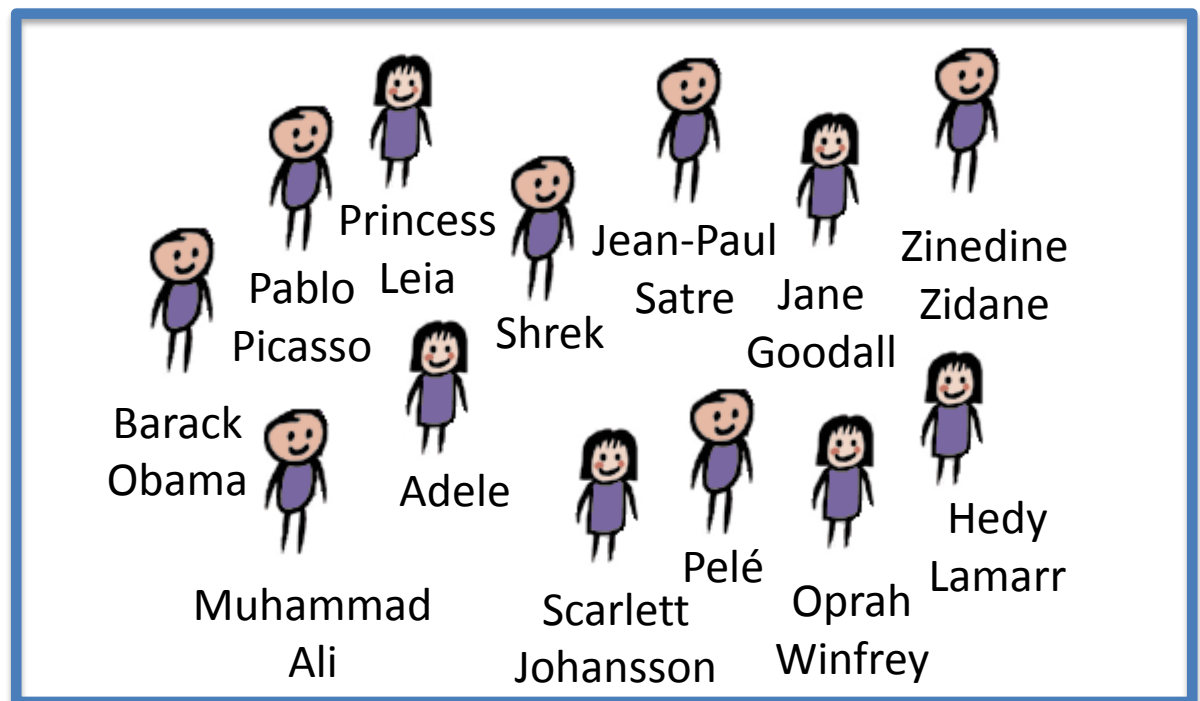
Virtual Panel 1

(n=13)



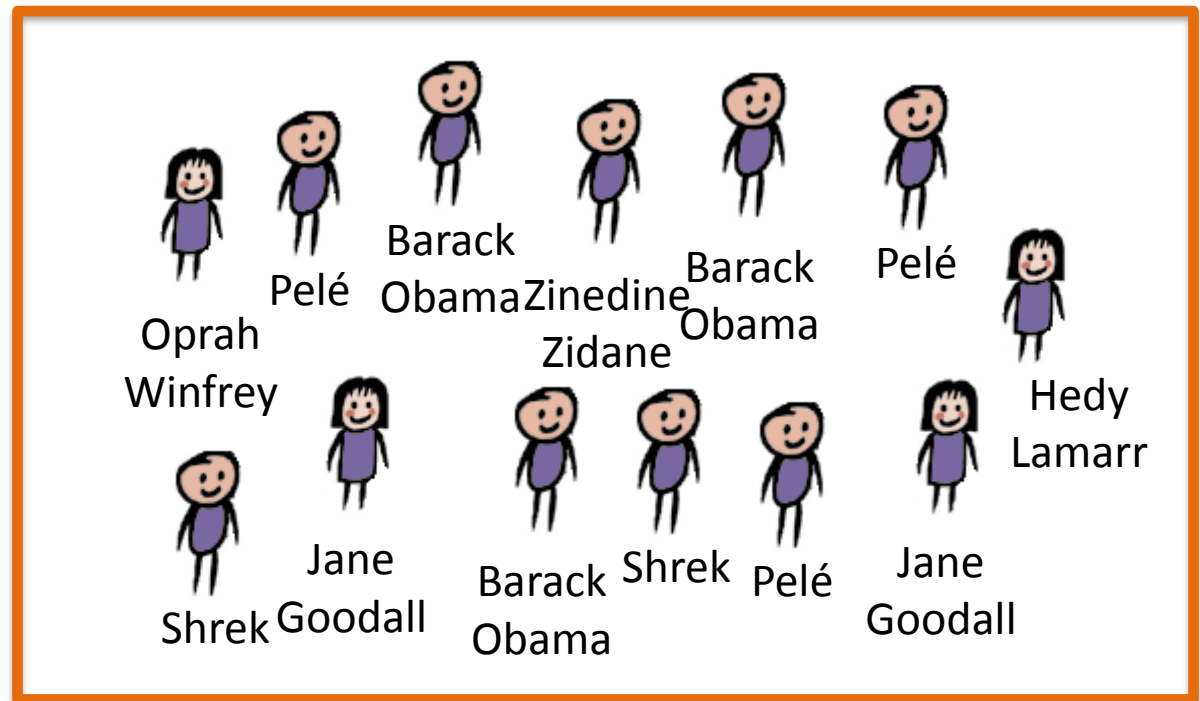
The Real Panel

(n=13)



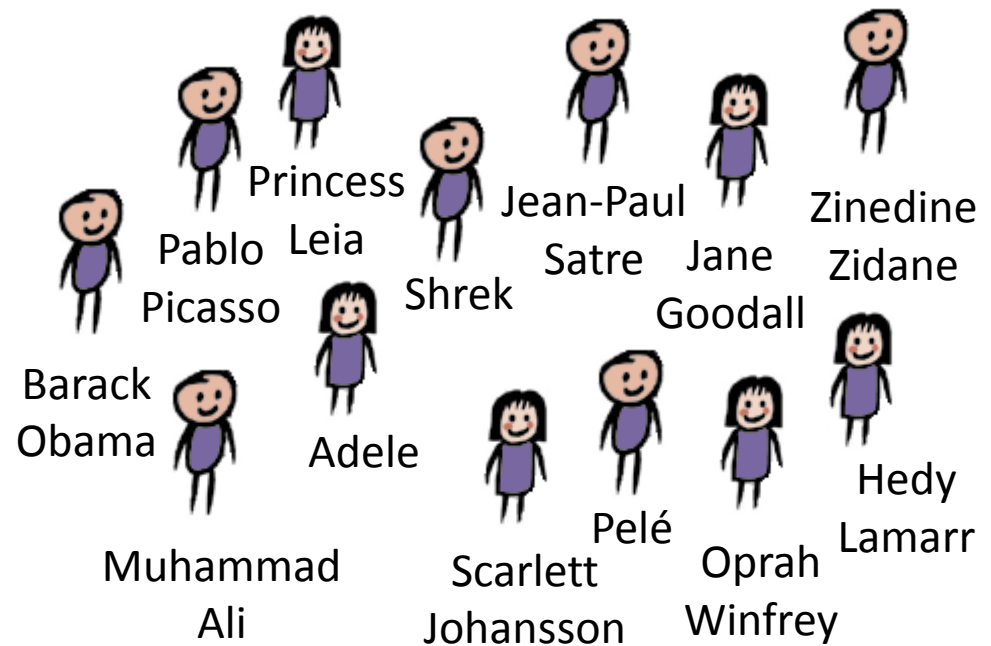
Virtual Panel 1

(n=13)



The Real Panel

(n=13)



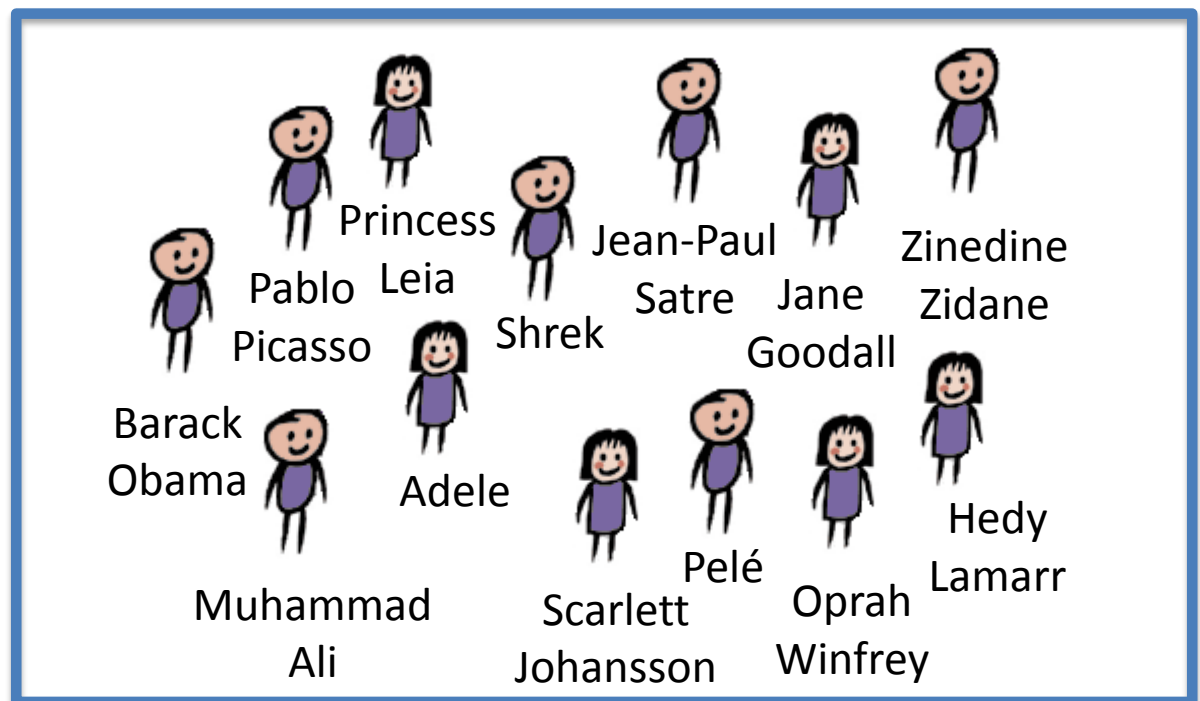
Virtual Panel 2

(n=13)



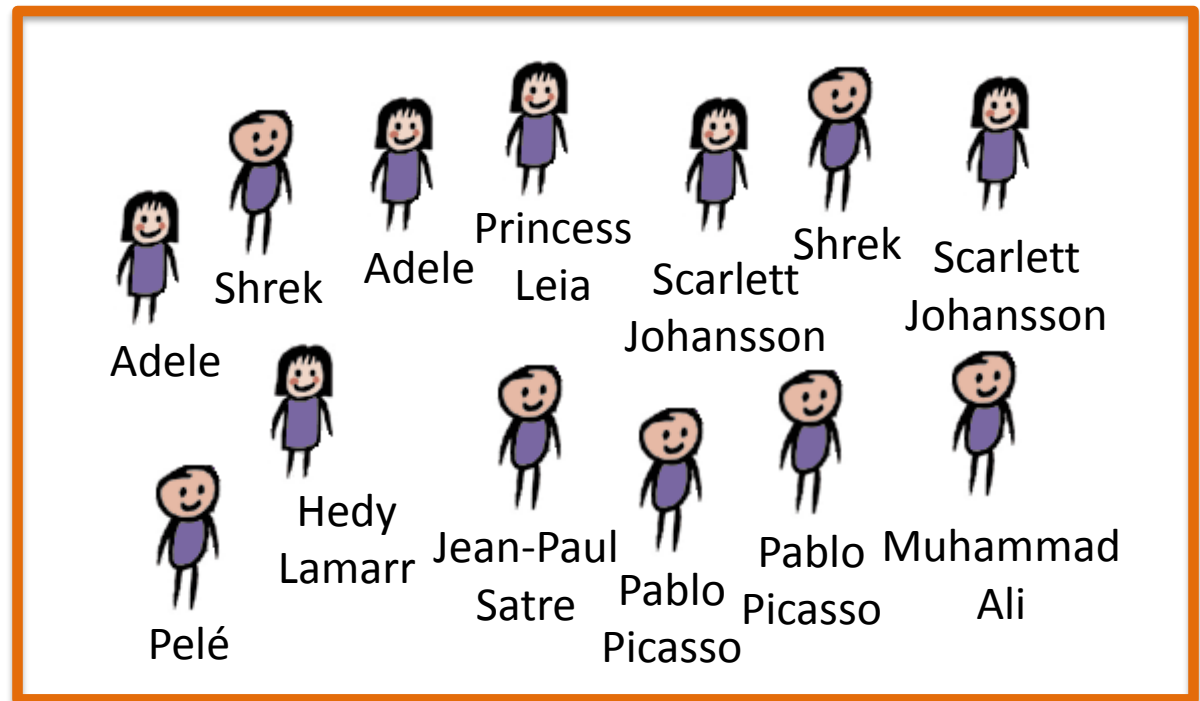
The Real Panel

(n=13)



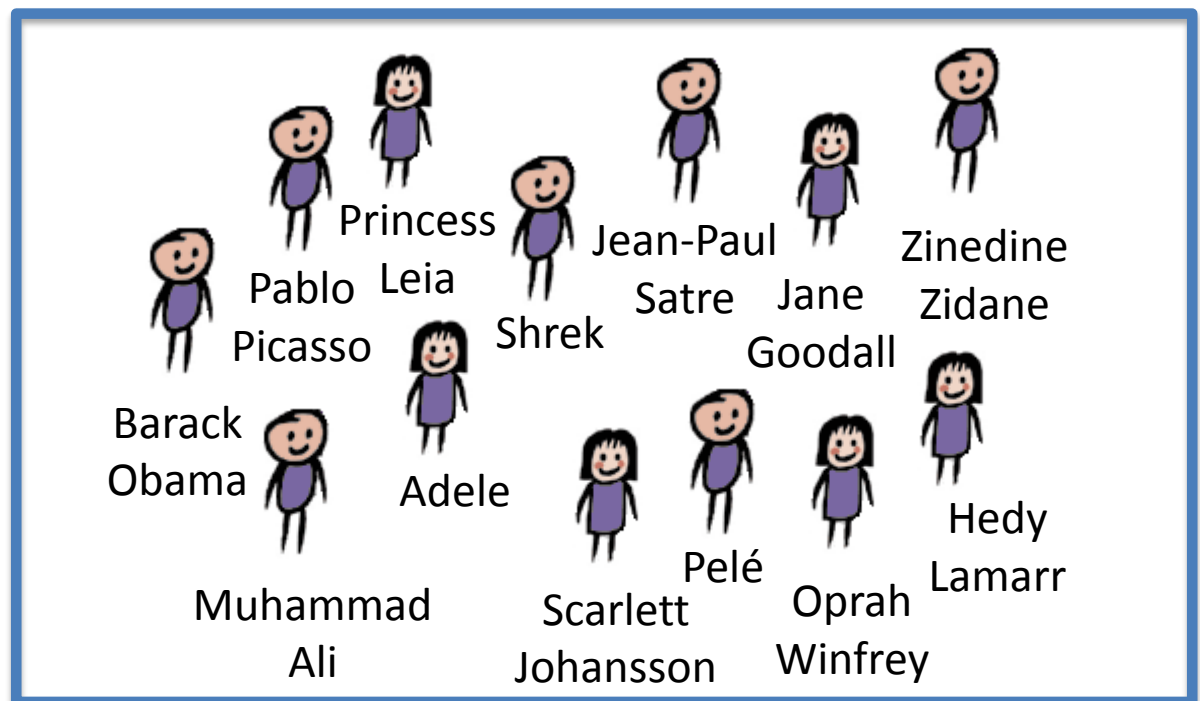
Virtual Panel 2

(n=13)



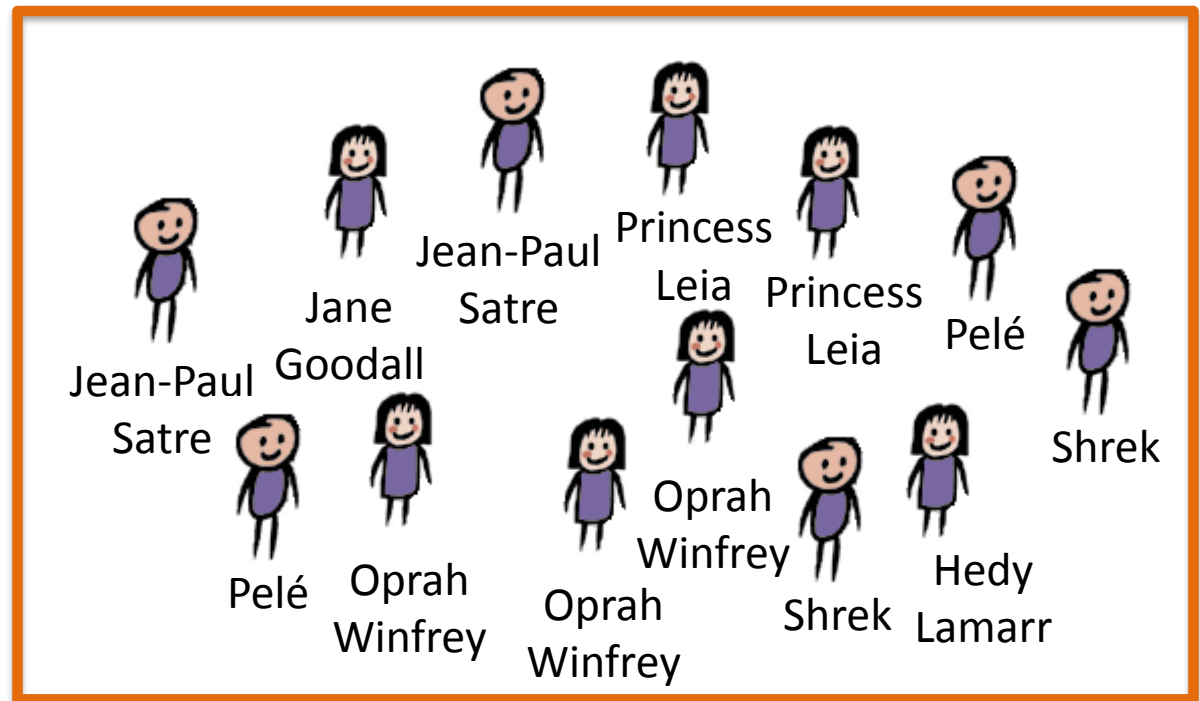
The Real Panel

(n=13)



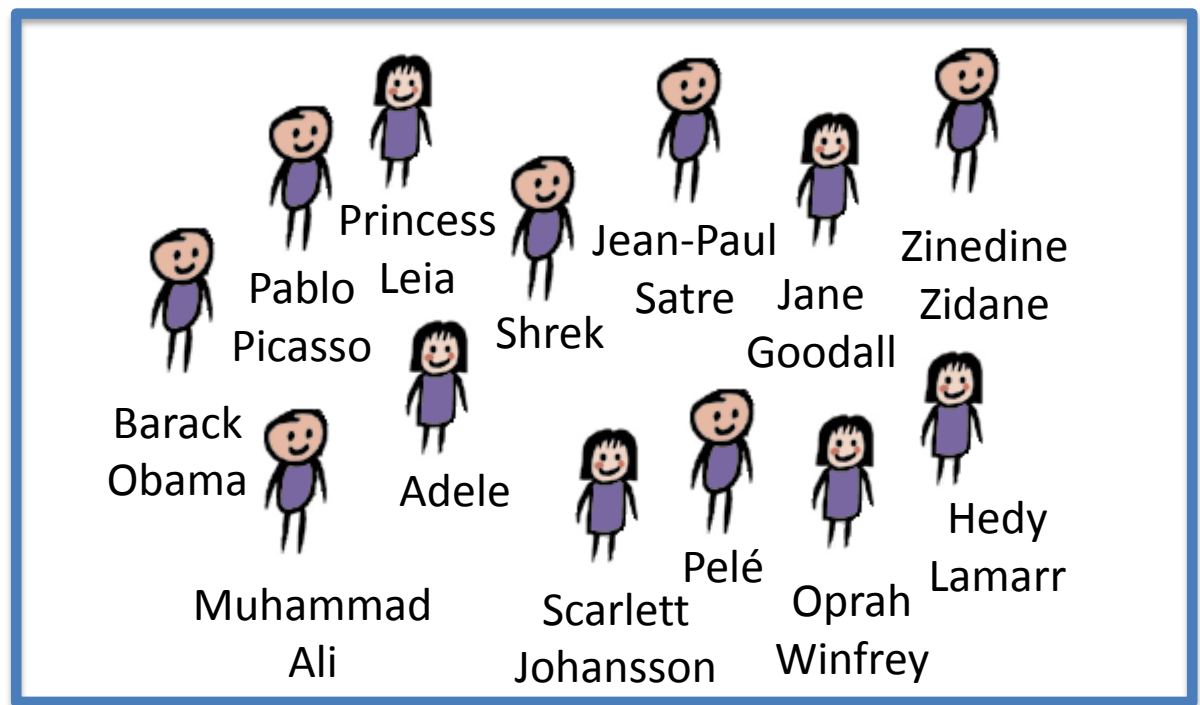
Virtual Panel 3

(n=13)



The Real Panel

(n=13)



...and so on...

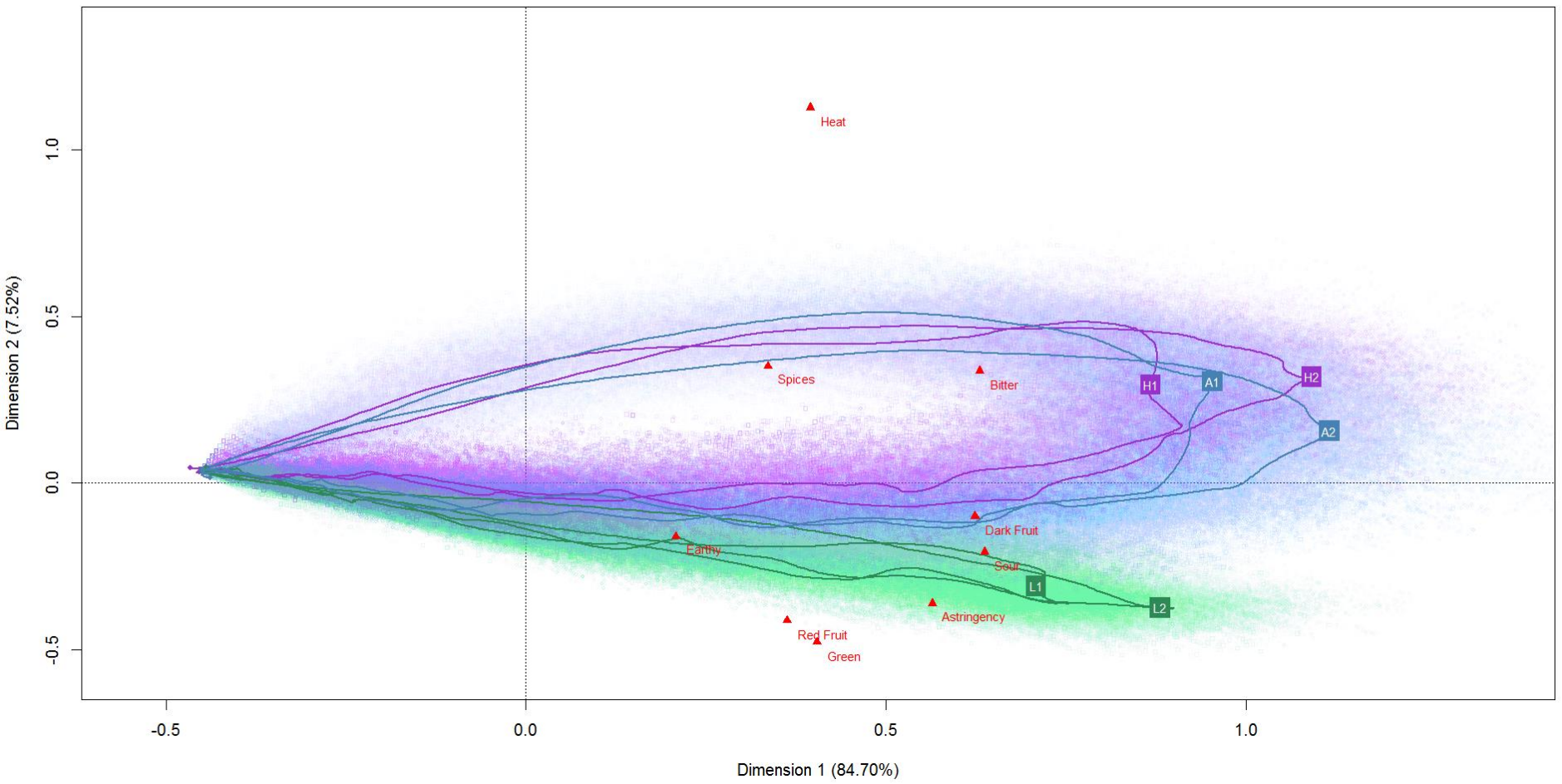
Partial bootstrap

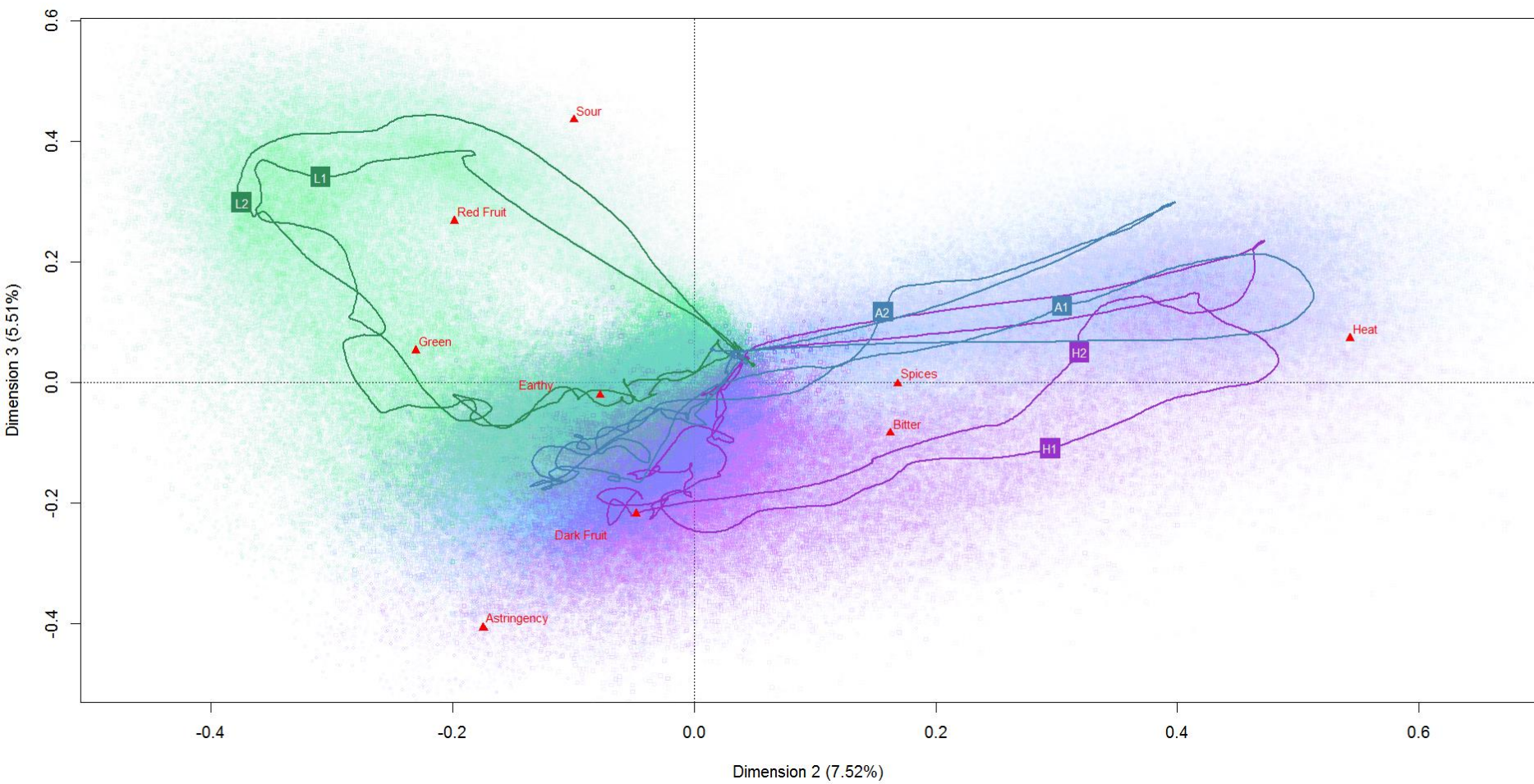
1 real panel (n=13)

+

499 virtual panels (n=13)

For each panel, obtain and project coordinates for each **WineSip**×**Time** into the multivariate sensory space

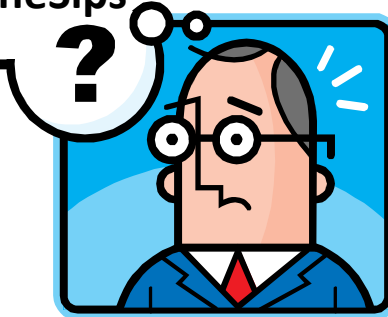


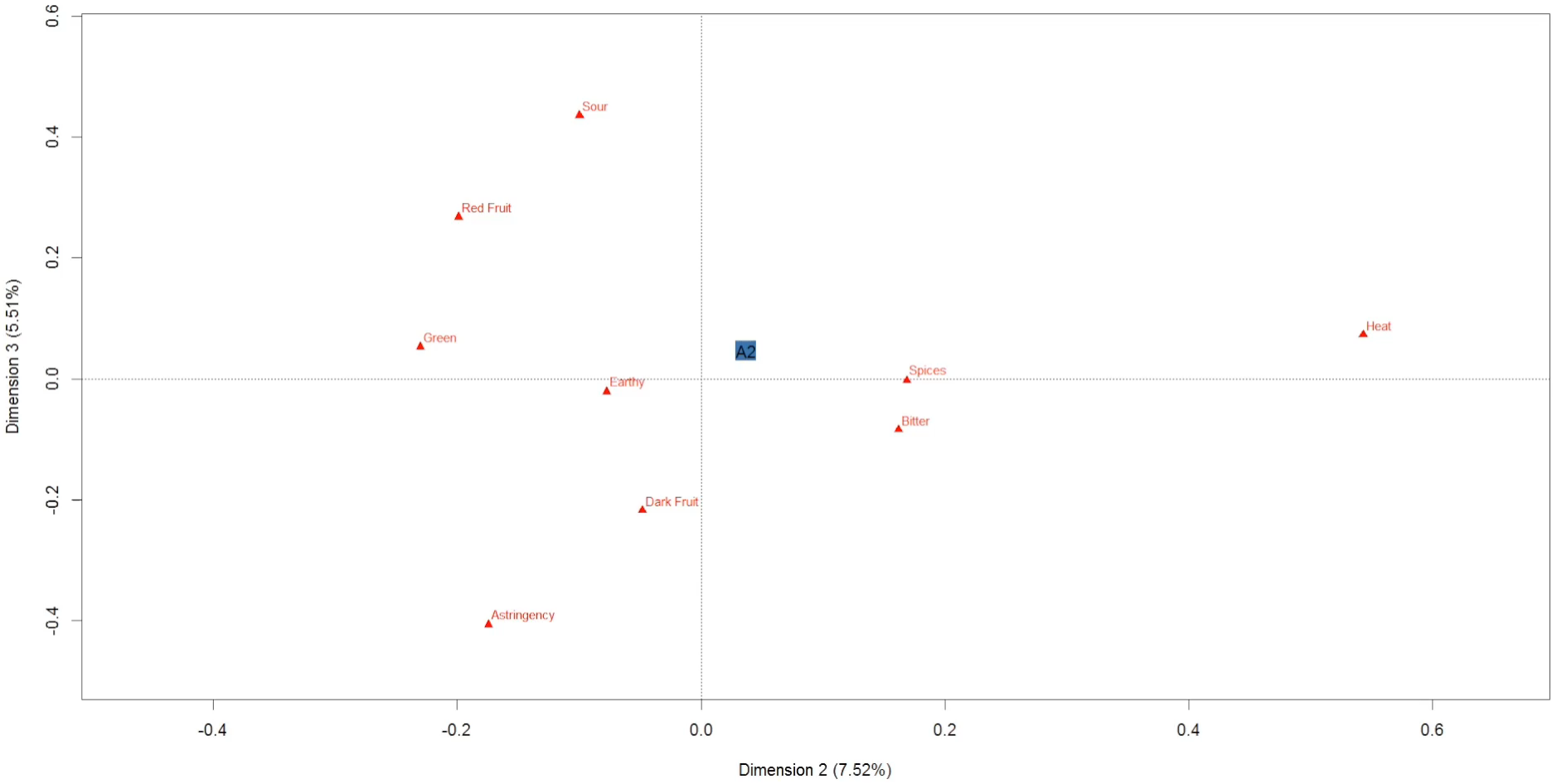


Contrails



How do flavours evolve
in the finish of the
WineSips





Selected TCATA Publications

- Castura et al. (2016). Temporal Check-All-That-Apply (TCATA): A Novel Temporal Sensory Method for Characterizing Products. *Food Quality and Preference*, 47A, 79-90. <http://dx.doi.org/10.1016/j.foodqual.2015.06.017>
- Ares et al. (2016). Comparison of TCATA and TDS for dynamic sensory characterization of food products. *Food Research International*, 78, 148-158. <http://dx.doi.org/10.1016/j.foodres.2015.10.023>.
- Boinbaser et al. (2015). Dynamic sensory characterization of cosmetic creams during application using Temporal Check-All-That-Apply (TCATA) questions. *Food Quality and Preference*, 45, 33–40. <http://dx.doi.org/10.1016/j.foodqual.2015.05.003>
- Oliveira et al. (2015). Sugar reduction in probiotic chocolate-flavored milk: Impact on dynamic sensory profile and liking. *Food Research International*, 75, 148-156. <http://dx.doi.org/10.1016/j.foodres.2015.05.050>

Thank you for your attention!

John C. Castura



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Carolyn F. Ross



14th Agrostat Symposium on Statistical Methods for the Food Industry
21-24 March 2016. Lausanne, Switzerland.