# Hudap (Wssa) applied to data from experimental designs

## Fabrice Buschini

## LPS – EHESS (Paris)

# The data file:

- Results of three experiments on biased communications (Ns = 126, 142 et 139).

- Moscovici, S. & Buschini, F. (2000). Les communications biaisées sont-elles plus efficaces que les communications non biaisées ? *Journal de Psychologie. Académie des Sciences de Russie, 21*, 3, 20-33.

- 57 variables.

# Aim of the experiments:

- To show that the « correspondence hypothesis » of mass psychology (biased communications are more efficient than non biased communications) is not valid for all types of sources

- To test it on different types of biases

# Procedure

- Experiment presented to subjects as an image study of an association involved in the defense of the women rights

- Tract of the association to read (where the types of biases and sources of influence are manipulated)

- Series of measures or scales (agreement with the message, direct influence, latent influence, image of the association, image of the bias)

# Three biases used

- Miller, Turnball et MacFarland (1989).
  Individuation bias

- Kahneman et Tversky (1972).
  Sampling bias

- Schaller (1992).
  Frequency aggregation bias

# The individuation bias

- With an individualizing information, subjects are focused on it and don't think in terms of proportion

- Example (non biased in brackets)
  - In the attribution of a grant, after a short exam he corrected himself, the person responsible gives the grant to a man among candidates who **initially** had the required level. The candidates were 1 (10) man (men) and 9 (90) women.

# The sampling bias

- There is a larger possibility to observe an extreme event with a small sample than with a large one

- Example (biased in brackets)

| Sample size | Evaluation after courses | Final exam |
|---|---|---|
| 150 (*10*) girls | 120 (8) successes/150 (*10*) | 30 (2)/150 (*10*) |
| 150 (*10*) boys | 120 (8) successes/150 (*10*) | 120 (8)/150 (*10*) |

# The aggregation bias

- With small samples, people wrongly tends to aggregate tables of contingencies

- Example (biased in brackets)

| | ENA's exam | | Centrale's exam | |
|---|---|---|---|---|
| | Admitted | Non admitted | Admitted | Non admitted |
| Men (*Women*) | 2 | 6 | 2 | 0 |
| Women (*Men*) | 0 | 2 | 6 | 2 |

# The variables:

- Independent variables
  - Source (majority, minority, anonymous)
  - Bias (biased, non biased)
  - Expe (individuation, sample, aggregation)

- Dependant variables
  - 1 for agreement and 6 for direct influence
  - 23 for indirect influence
  - 13 for the image of the source and 11 for the image of the bias

# Results of the Moscovici and Buschini (2000) study

- Direct influence
  - Majority and anonymous sources are more influent than minority (effect of source)
  - No correspondence hypothesis (no effect of bias)

- Indirect influence
  - Correspondence hypothesis only for majority and anonymous sources and not for the minority one (interaction effect source by bias)
  - Majority and anonymous sources are more influent with a biased message and minority with a non biased one
  - Results are less manifest for the third bias

# Analysis with Hudap (Wssa)

- Suitable with the form of variables
  - All the dependant variables are measured on the interval level (0 to 10, 1 to 5 or 1 to 7 scales)

- Problematic with a factorial design
  - 3 (majo, mino, ano) by 2 (biased, non biased) by 3 (indiv, sampl, aggreg) between subjects
  - Difficulties in comparing 18 experimental conditions

# A first solution

- The Disco procedure in Hudap

- Gives a good indication on the differences between groups

- Equivalent to classical procedures

  – Why use Hudap instead of an analysis of variance or a regression analysis ?
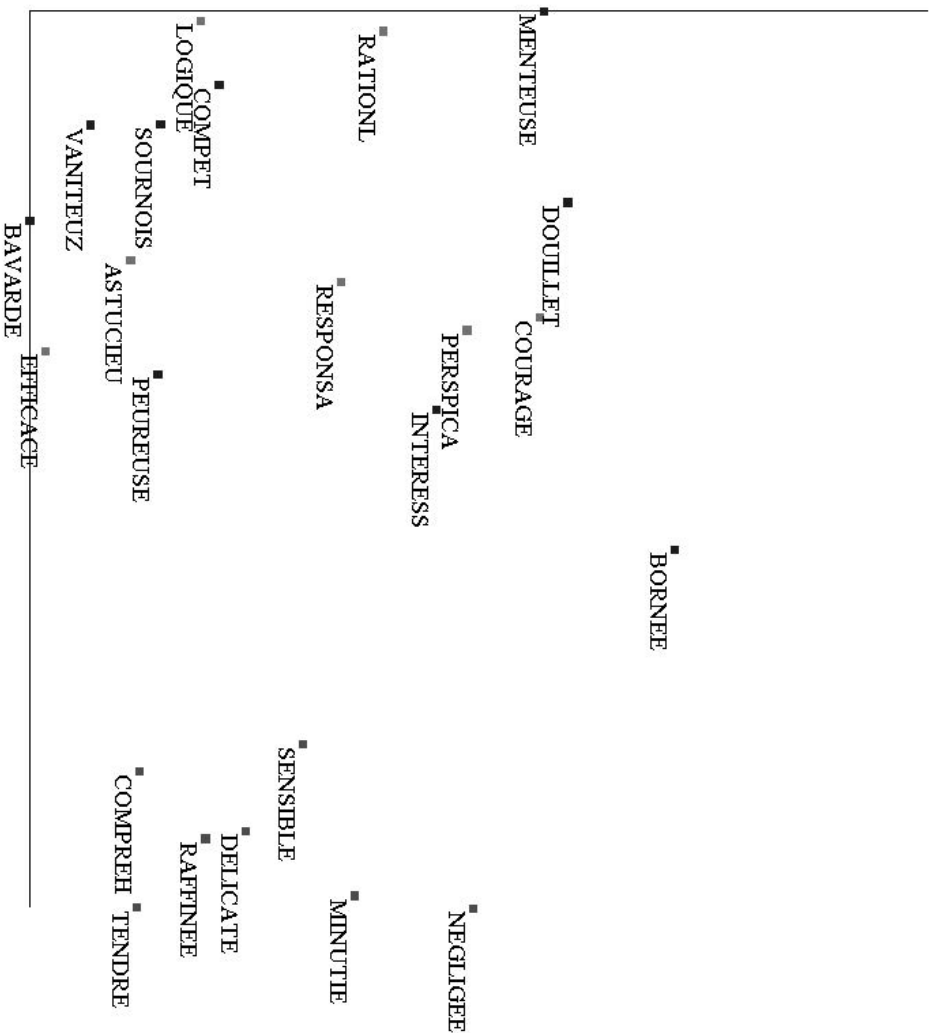
# Examples of Disco results

X

# Hudap (Wssa) offers other solutions

- Projection of the experimental groups as external (or illustrative) variables in the space of the variables

- Comparison of the spatial representations of different groups

  – Help in the facet analysis

# Steps of the analysis conducted on the latent influence

- Wssa on the 23 variables for all groups

- Projection of the group variables

- Wssa for particular groups

- Comparison between those methods
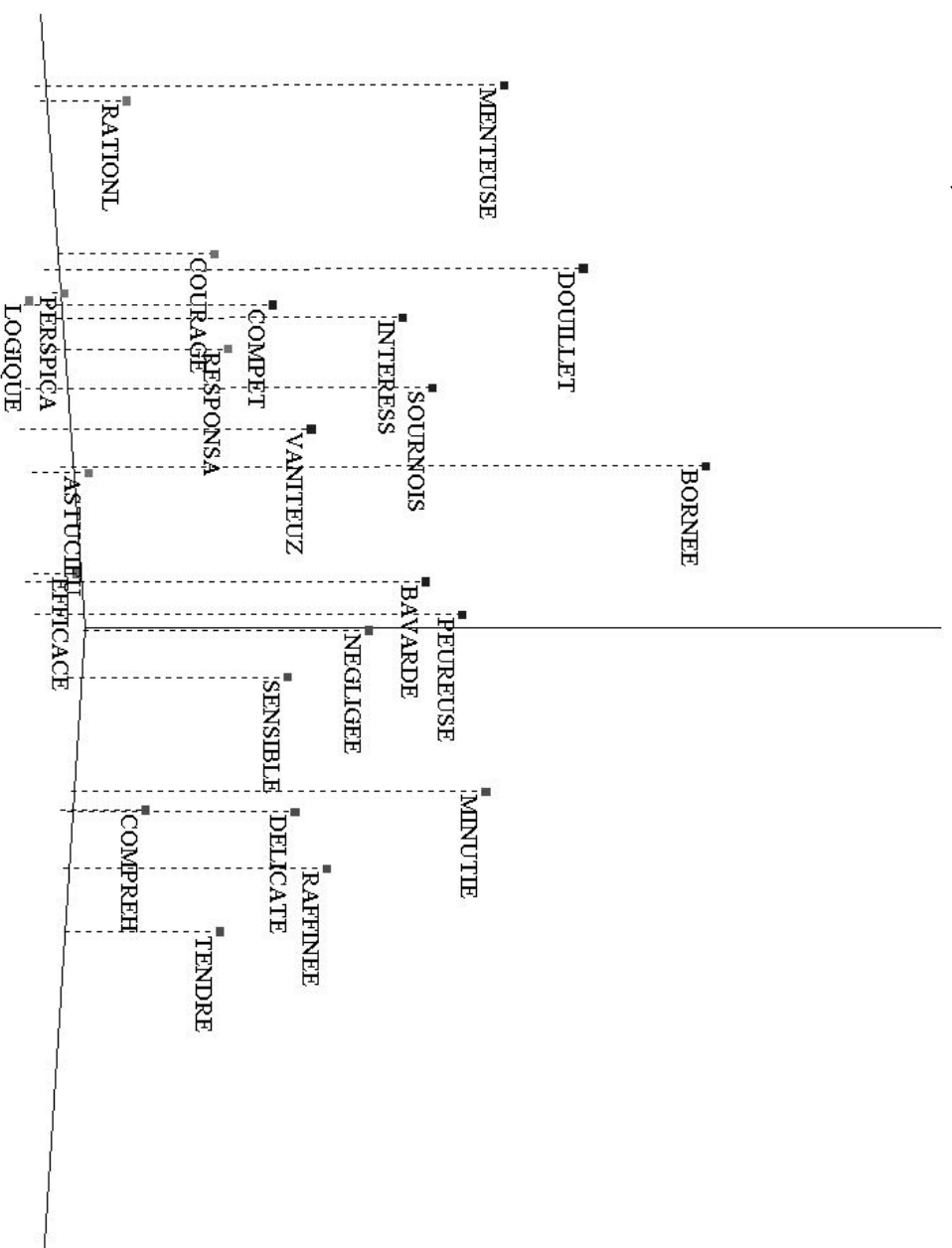
# 2-D Wssa for all groups (n=408, ca=0,232)

MENTEUSE

LOGIQUE
COMPET

RATIONL

VANITEUZ
SOURNOIS

BAVARDE
ASTUCIEU
EFFICACE

PEUREUSE

DOUILLET
COURAGE

RESPONSA

PERSPICA
INTERESS

BORNEE

SENSIBLE

DELICATE
RAFFINEE

COMPREH  TENDRE

MINUTIE

NEGLIGEE

# Remarks about the representation

- The fit index is not so bad (0.232)

- The data partly confirms (does not invalidate) the construction of the scale : proximities seem to follow the facets attributed to the variables

  – red for positive typical feminine features

  – blue for negative feminine features

  – green for typical masculine features denied to women

# 3-D Wssa for all the groups (n=408, ca=0,161)

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RESPONSA

COMPET

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BORNEE

ASTUCIE
EFFICACE

BAVARDE
PEUREUSE

NEGLIGEE

SENSIBLE
DELICATE

MINUTIE

RAFFINEE

COMPREH

TENDRE

# 2-D or 3-D representation?

- Bidimensional
  - less good fit
  - projection error
  - easy to read

- Tridimensional
  - better fit
  - projection error could be reduced or increased by the rotation
  - good angle or perspective difficult to find
  - difficult to read
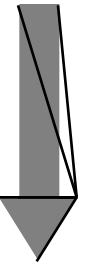
3-D is better, but 2-D is preferable in a comparison process

# The same 2-D Wssa with different illustrative variables

- nature of source

- construction of message

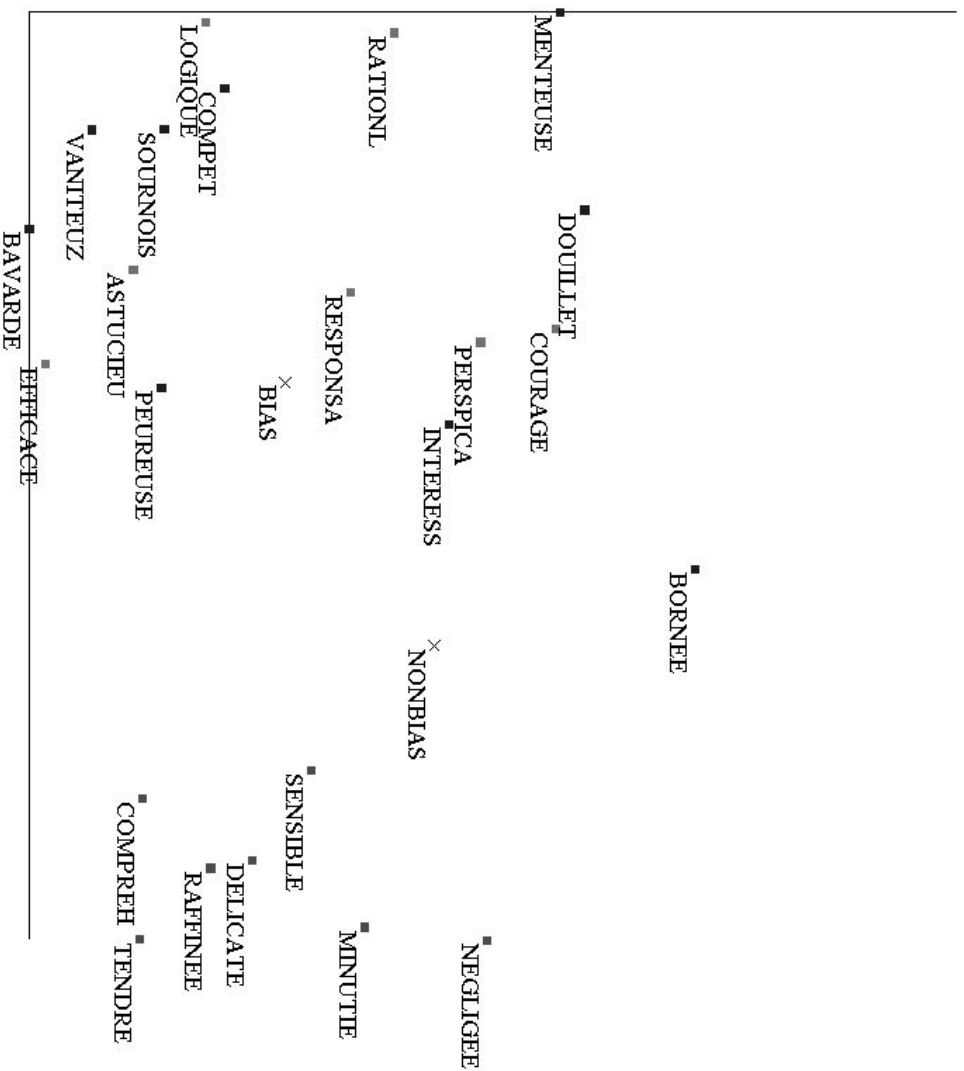- types of bias

- experimental conditions

# Wssa with sources as illustrative variables (n=408, ca=0,232)

# Informations given by illustrative sources of the message

- Minority and majority differ one from the other, and also differ from the anonymous source which appears as an intermediate

- The Anova only showed a marginal effect of the source: The anonymous source has a tendency to have a greater indirect influence than the two other sources

- If the anonymous source is still separate from the others, those are nevertheless different here

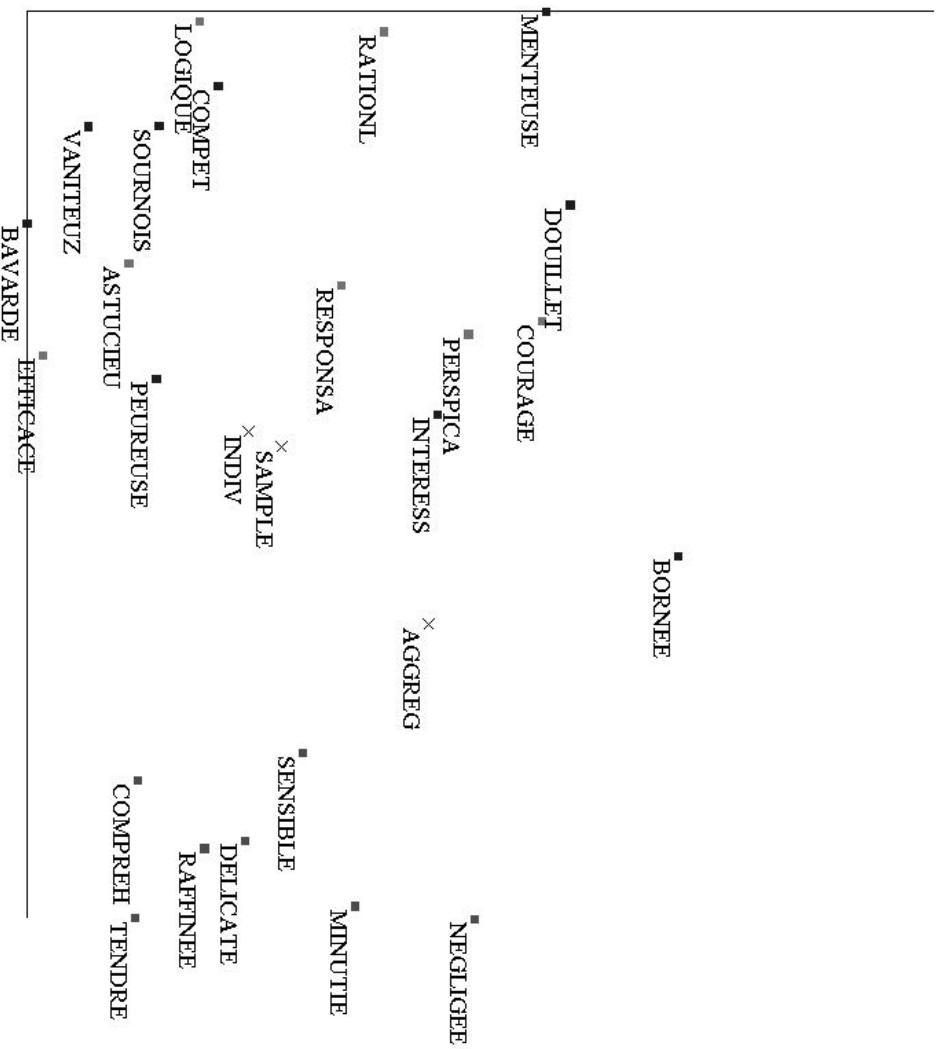# Wssa with types of message as illustrative variables (n=408, ca=0,232)

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COURAGE

PERSPICA
INTERESS

RESPONSA

× BIAS

PEUREUSE

BORNEE

× NONBIAS

NEGLIGEE

SENSIBLE

DELICATE
RAFFINEE

MINUTIE

COMPREH  TENDRE

Informations given by illustrative form of the message

- Non biased messages and biased ones do not seem to have the same impact on the indirect influence (on the structure of the different features of the discriminative stereotype of women)

- This point did not appear in the former analysis

# Wssa with types of bias as illustrative variables (n=408, ca=0,232)



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BAVARDE EFFICACE

ASTUCIEU PEUREUSE

DOUILLET COURAGE

PERSPICA INTERESS

RESPONSA

SAMPLE
INDIV

BORNEE

AGGREG

SENSIBLE

COMPREH TENDRE

DELICATE
RAFFINEE

MINUTIE

NEGLIGEE

# Information given by illustrative types of biases

- Here, the aggregation bias clearly appears to have an impact on the measure of the indirect influence different from the sampling and individuation biases

- As was already the case in the former analysis where this bias showed a different nature

# Wssa with experimental conditions as illustrative variables (n=408, ca=0,232)
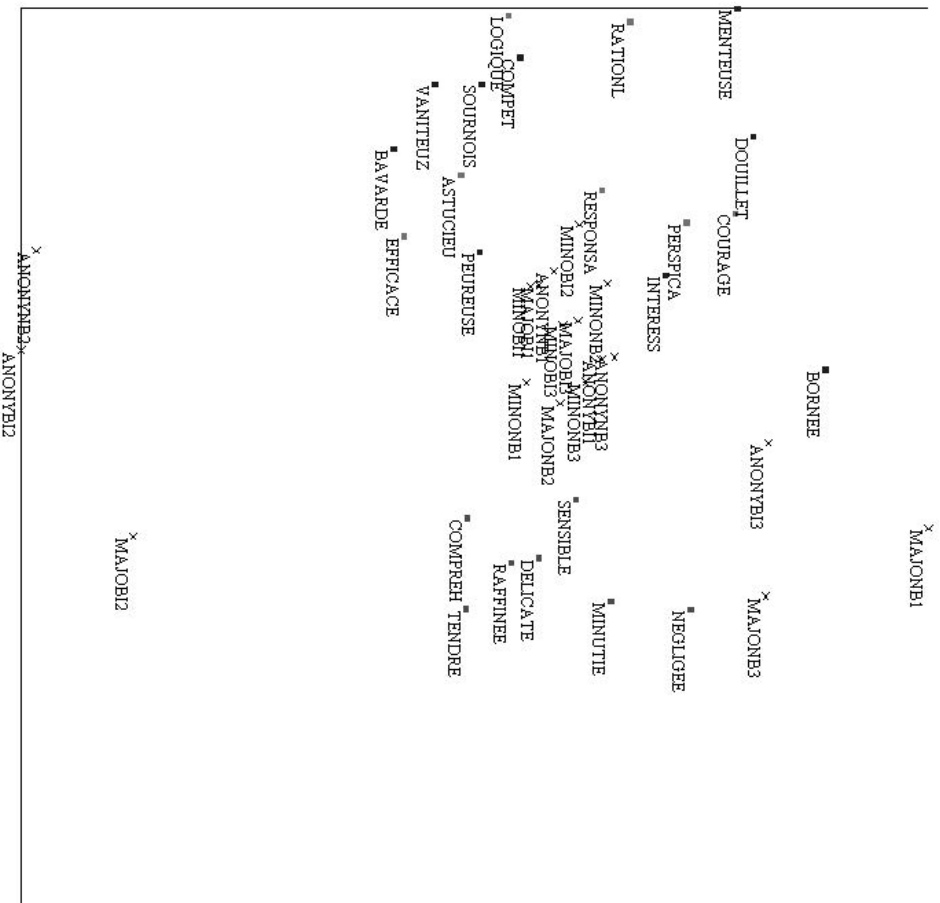
# Informations given by illustrative groups

- For the individuation bias, the majority source with non biased message seems to be separate

- For the sampling bias, the majority and anonymous sources with a biased message seem to have the same form of latent influence, different from other conditions

  – No difference for the anonymous source whatever the message is

- For the aggregation bias, a majority with a non biased message and an anonymous source with a biased one show a similar form of latent influence, which differs from other conditions
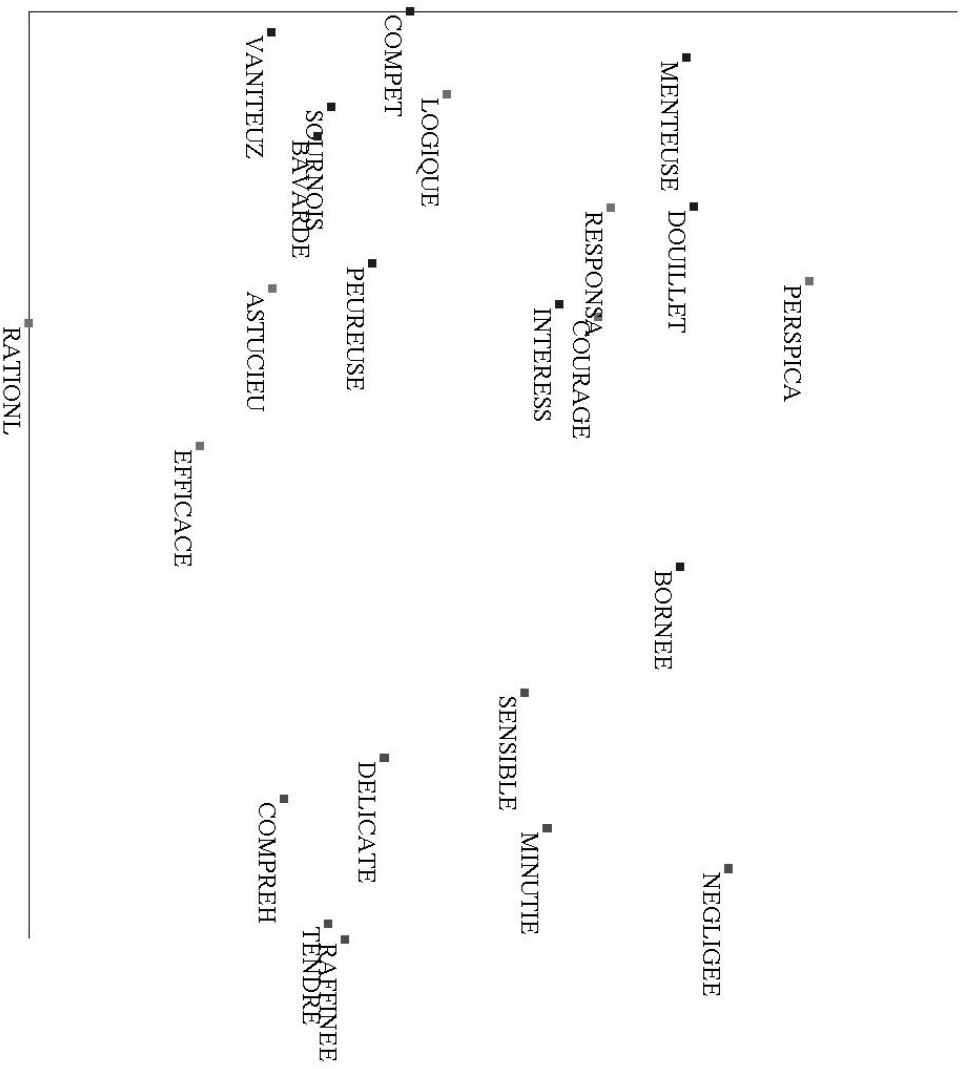
# Initial Results

- Only few results reproduce the former ones

- The special status of the aggregation bias seems to interfere

  - Deformation of the two other types of biases (correspondence hypothesis seems less valid)

  - Contradiction with the former analysis (were correspondence hypothesis was less strong)
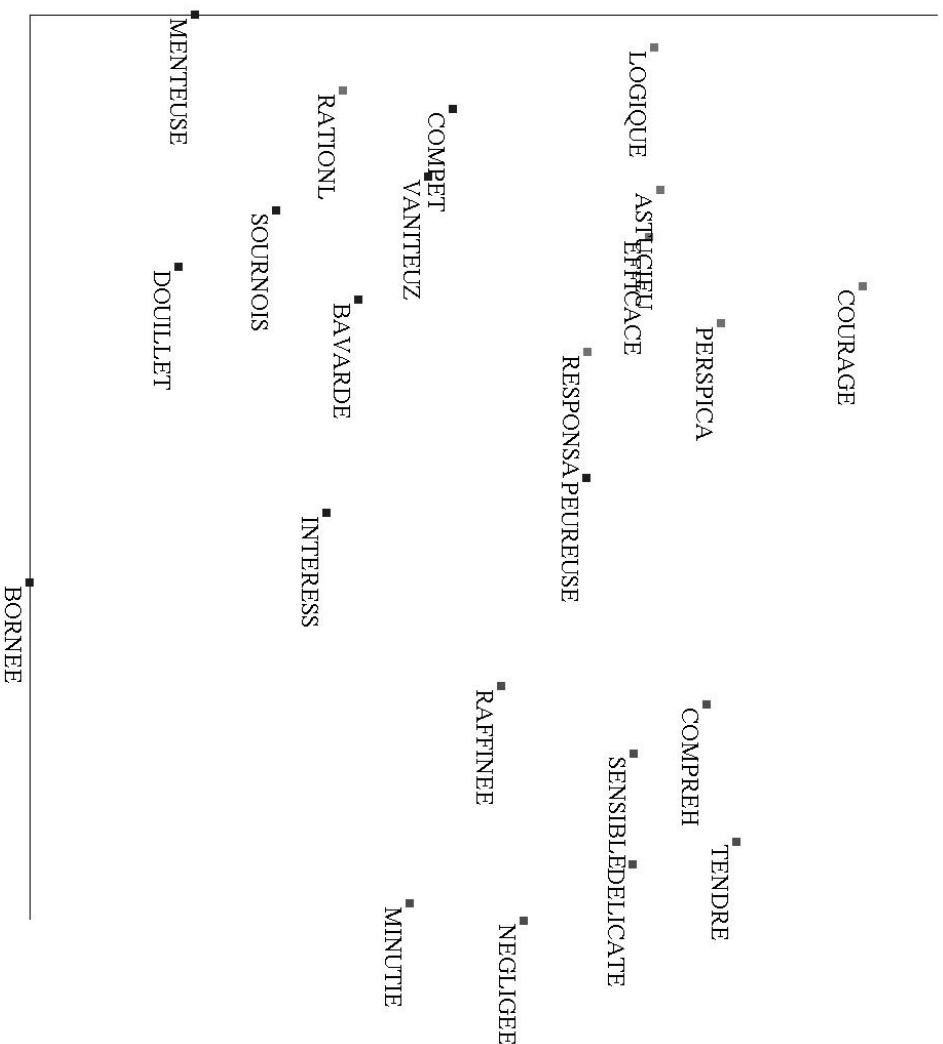
  To make different analyses for the aggregation bias and for the two other ones

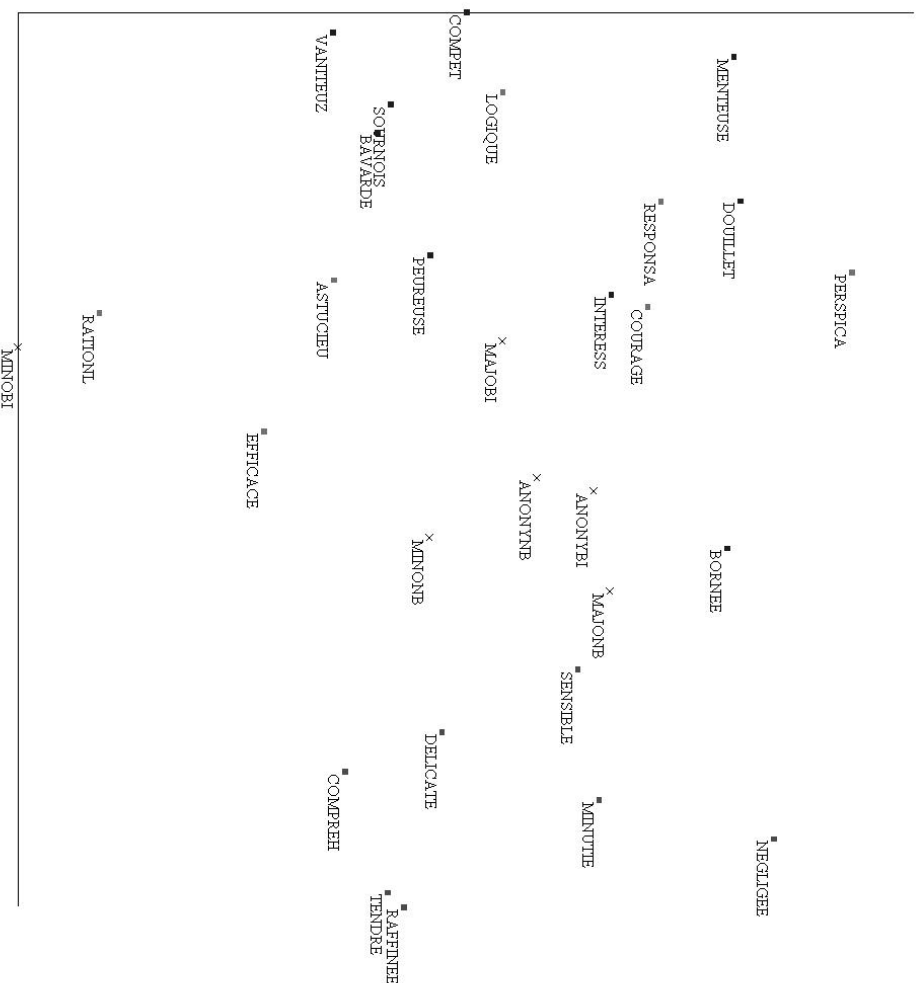# Wssa for the aggregation bias (n=139, ca=0,238 and 0,161)

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BAVARDE

MENTEUSE  DOUILLET

RESPONSA
COURAGE
INTERESS

PERSPICA

PEUREUSE

ASTUCIEU

RATIONL

EFFICACE

BORNEE

SENSIBLE  MINUTIE

DELICATE

NEGLIGEE

COMPREH
RAFFINEE
TENDRE

# Wssa for the individuation and sampling biases (n=269, ca=0,257 and 0,163)



The scatter plot contains the following labels:

MENTEUSE, LOGIQUE, RATIONL, COMPET, VANITEUZ, ASTUCIEU, EFFICACE, SOURNOIS, BAVARDE, DOUILLET, RESPONSA, PEUREUSE, PERSPICA, COURAGE, INTERESS, RAFFINEE, SENSIBLE, DELICATE, COMPREH, TENDRE, MINUTIE, NEGLIGEE, BORNEE

# Wssa for the aggregation bias with illustrative groups (n=139, ca=0,238 and 0,161)

COMPET

VANITEUZ

MENTEUSE

SOUPRNOIS
BAVARDE

LOGIQUE

DOUILLET

RESPONSA

PERSPICA

ASTUCIEU

PEUREUSE

COURAGE

INTERESS

MAJOBI

RATIONL

MINOBI

EFFICACE

ANONYNB

BORNEE

ANONYBI

MINONB

MAJONB

SENSIBLE

MINUTIE

NEGLIGEE

DELICATE

COMPREH

RAFFINEE
TENDRE

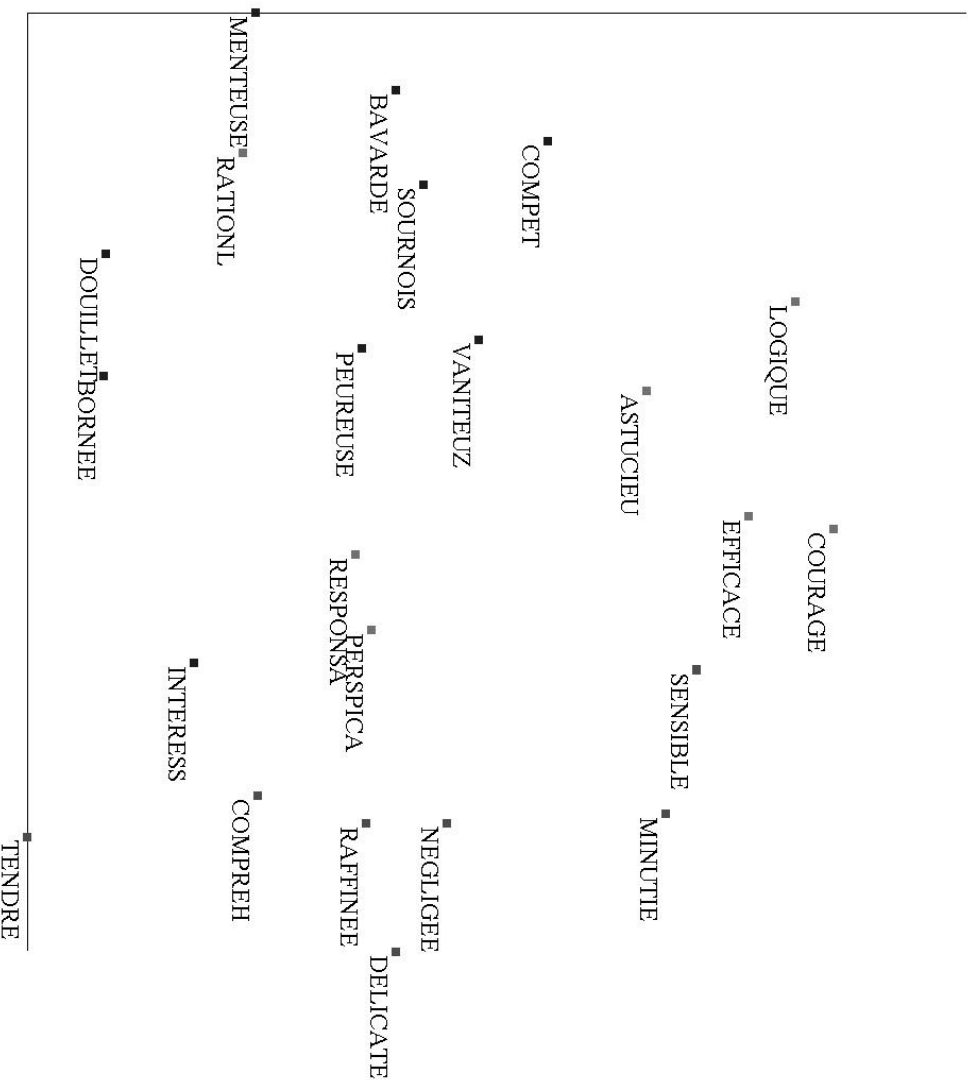# Wssa for the individuation and sampling biases (n=269, ca=0,257 and 0,163)
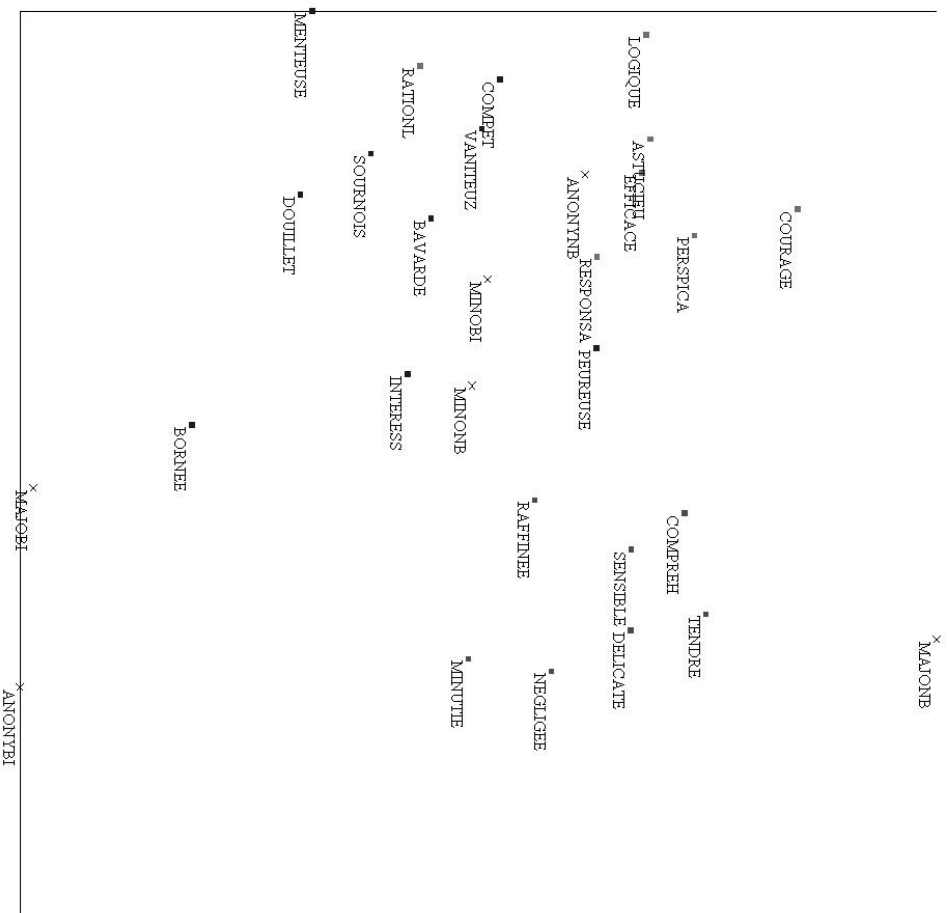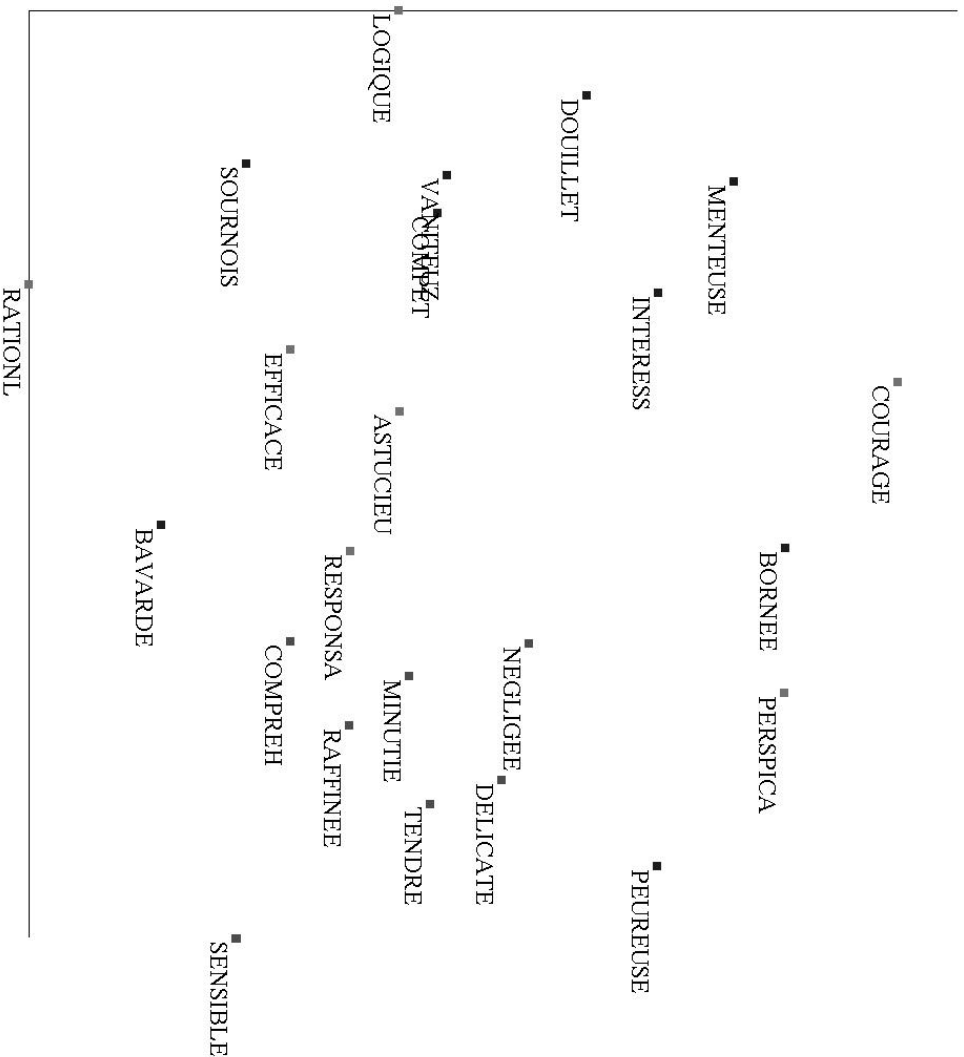
# Initial Results

- Different structures for the two analyses
  - Facets modalities (elements) are less clear in the aggregation bias
  - The 'éternel féminin' modality is less spred in the individuation and sampling biases

- Differences in experimental groups vary in the two analyses
  - Minority with a biased message seems to perturbate the structure in the aggregation bias
  - In the two other biases, majority and anonymous biased sources in opposition with a non biased minority seem to change the structure

- Let's look at those differences in the individuation and sampling biases between

  – Biased majority
  – Non biased minority

# Wssa for biased majority in the individuation and sampling biases (n=46, ca=0,251 and 0,166)

MENTEUSE

RATIONL

BAVARDE

SOURNOIS

COMPET

DOUILLETBORNEE

VANITEUZ

LOGIQUE

PEUREUSE

ASTUCIEU

EFFICACE

COURAGE

RESPONSA

PERSPICA

INTERESS

SENSIBLE

MINUTIE

COMPREH

RAFFINEE

NEGLIGEE

DELICATE

TENDRE

# Wssa for the non biased minority in the individuation and sampling biases (n=47, ca=0,262 and 0,176)

LOGIQUE

DOUILLET

SOURNOIS

VACUITE

MENTEUSE

INTERESS

COURAGE

RATIONL

EFFICACE

ASTUCIEU

BORNEE   PERSPICA

BAVARDE

RESPONSA

COMPREH

RAFFINEE

MINUTIE

TENDRE

NEGLIGEE

DELICATE

PEUREUSE

SENSIBLE

# Secondary Results

- Structures still change between those two groups

  - The facet looks more validated with the biased majority

  - But the 'éternel féminin' modality seems more homogeneous with the non biased minority

- Differences in terms of proximity and regionality could surely be found with other groups appearing distant when projected as external variables

  - But you can breath, we won't compare all the different groups

# Conclusion

- The two methods cause the differences between groups to appear

- It is a qualitative difference (structure)

- Not a quantative one (means or frequencies)

- Some other solutions are more sexy, but E. Cohen gave me his ideas too late