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Highlight of important product characteristics for consumers:
Comparison of three sensory descriptive methods

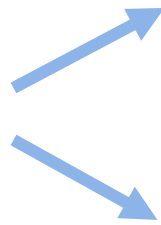
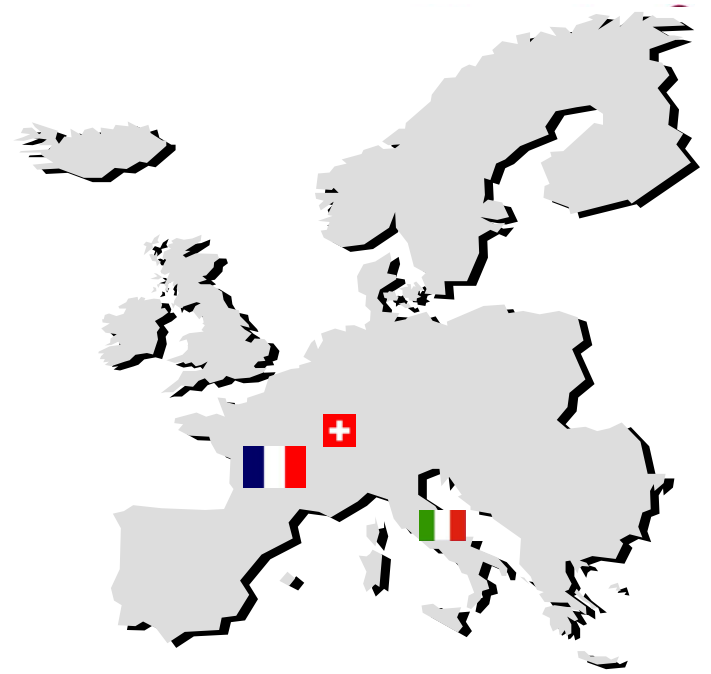
Objective

- Understand how French consumers perceive lemon Ice teas thanks to the comparison of three comparative descriptive methods:
 - Repertory Grid (RG)
 - Flash Profile (FP)
 - Projective Mapping (PM)



Products

- 8 European market lemon ice teas:
(1 product was duplicated in order to check the panel repeatability)
- Why lemon Ice tea?

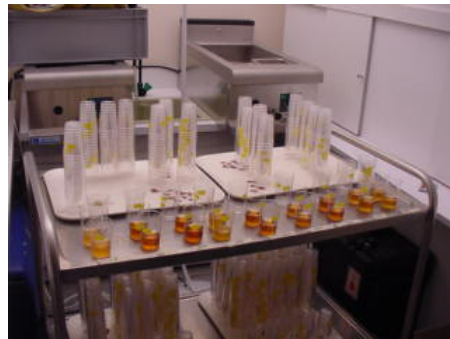


Simple matrix

Various flavour profiles

Sample preparation and presentation

- Storage at 4°C
- Products removed from the fridge 5 minutes before the serving
- Sample presentation: in plastic cups, coded with 3 digit numbers
- Sample quantity: 50ml for each evaluation (authorized re-serving)
- Rinsing: water and toast were available
- Presentation order: randomized



Assessors

- 125 French untrained consumers
 - 42 for Repertory Grid
 - 41 for Flash Profile
 - 40 for Projective Mapping

- From 18 to 60 years old

- 74% of women and 26% of men

- Regular consumers of lemon ice tea

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Methods

Principle

- The three methods are based on the same principle:

Object categorization, according to their similarity and dissimilarity, is the base on how human beings organize their environment (Kelly, 1955)

- Assessors use their own vocabulary to describe what they perceive

Repertory Grid (1)

- Background:

Based on Kelly's clinical psychological Theory of Personal Constructs (1955)
Kelly's objective: make people talk about how they perceive the world

Construct:

- having been constructed or developed from experience
- how people construe or interpret the world

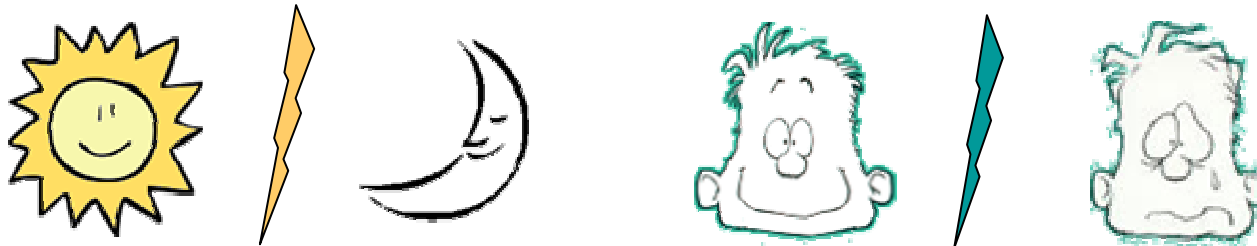


Repertory Grid (2)

- 2 steps
 - **1st step:** Construct elicitation
How two products of each triad are alike or different from the third?



- Bipolar construction allows to collect relevant and understandable information about what consumers perceive



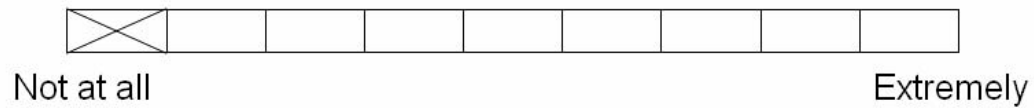
Repertory Grid (3)

- 2 steps
 - **2nd step:** scoring step

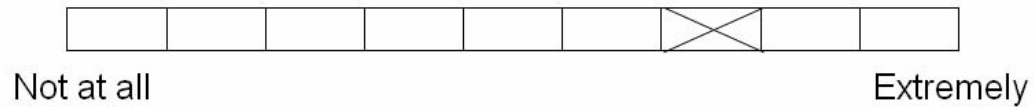
Cracker 1:



Tomato flavour :

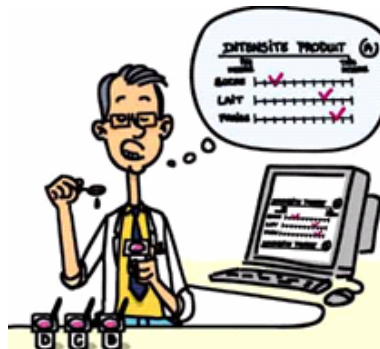


Salty :



Flash Profile (1)

- Background:
 - Free choice profiling (Williams and Langron, 1984): semantic freedom for choosing descriptive attributes and their number
 - Flash Profile (Sieffermann, 2000): combination of free choice profiling with a comparative evaluation of the product set
 - Initially created for expert panelists



Flash Profile (2)

- 2 steps
 - **1st step:** descriptors elicitation

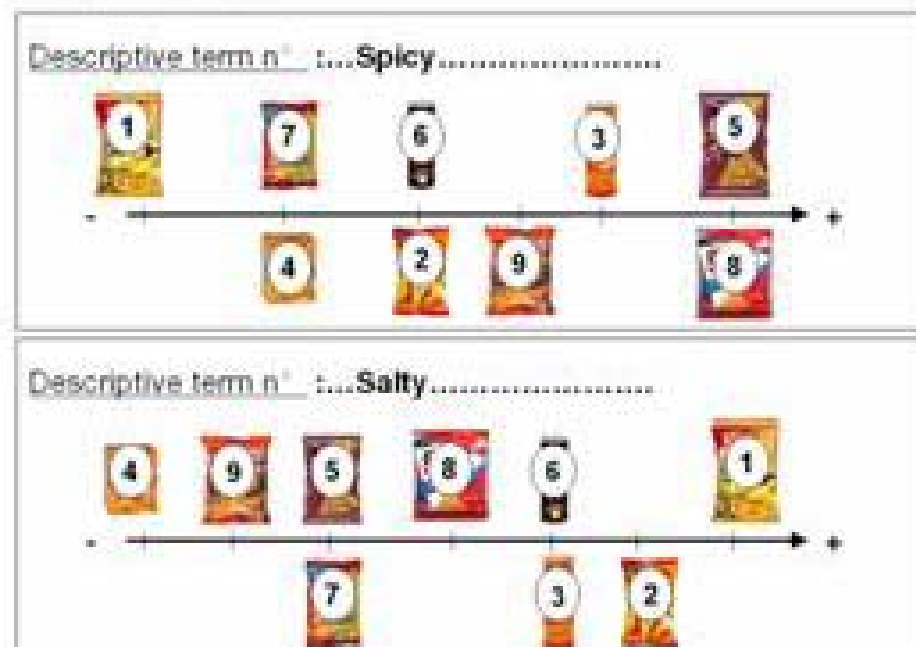


Descriptive terms:

- some are **saltier** than the others
- some are **spicier** than the others
- etc...

Flash Profile (3)

- 2 steps
 - **2nd step:** ranking step



Projective Mapping (1)

- Background:

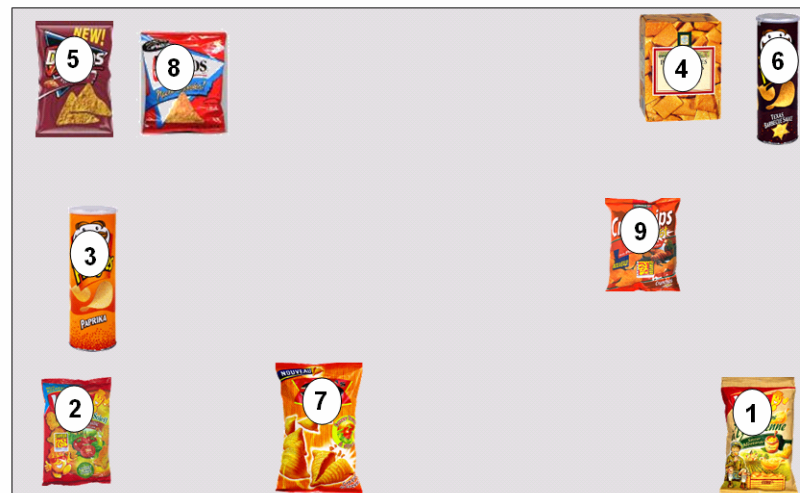
Used in cognitive psychology by Goldstone (1994) for collecting similarity data from human subjects efficiently

→ make a 2-D representation of the sensory world



Projective Mapping (2)

- 2 steps
 - **1st step:** to position products directly on the map according to the rule that the more two crackers are far from each others, the more their taste is different



Projective Mapping (3)

- 2 steps
 - **2nd step:** to describe what characterizes each product or group of products



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Results

Practical aspects

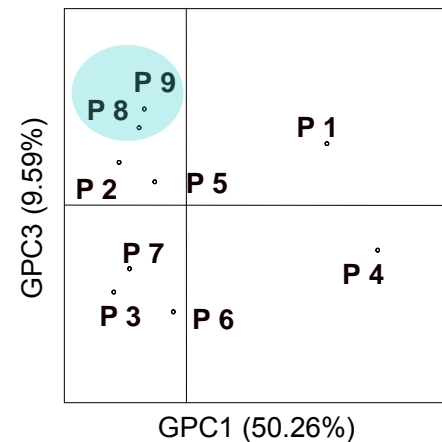
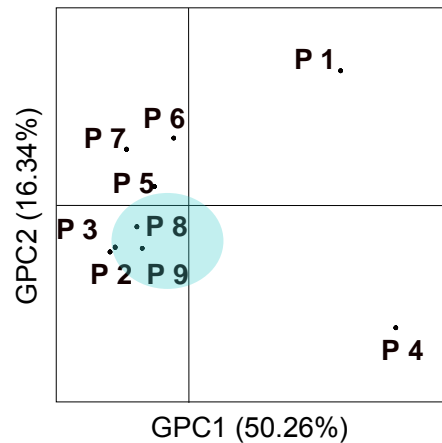
- For panelists:
 - Test duration:
Repertory Grid > Flash Profile > Projective Mapping
 - Ice Tea consumption:
Repertory Grid > Flash Profile > Projective Mapping
 - Test difficulty:
Projective Mapping >> Flash Profile & Repertory Grid

- For interviewers:
 - Data collection duration:
Projective Mapping >> Flash Profile & Repertory Grid

Panel repeatability (1)

- **P8 and P9 are duplicated products:** were they perceived as similar by the panelists?

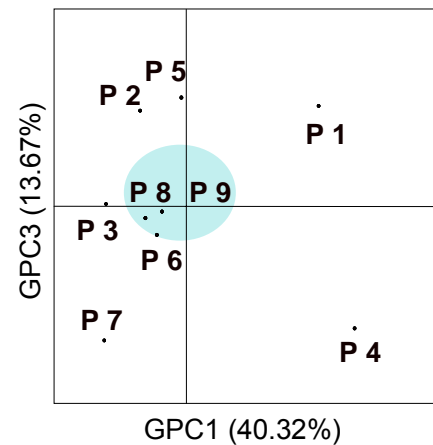
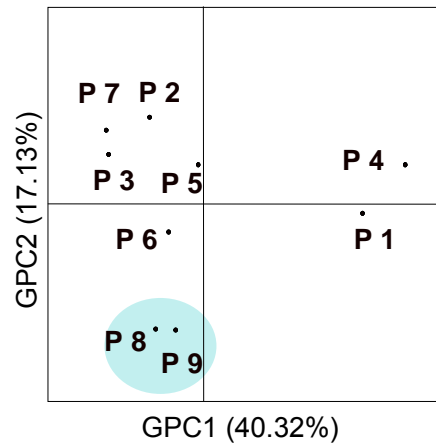
Repertory Grid



Panel repeatability (2)

- **P8 and P9 are duplicated products:** were they perceived as similar by the panelists?

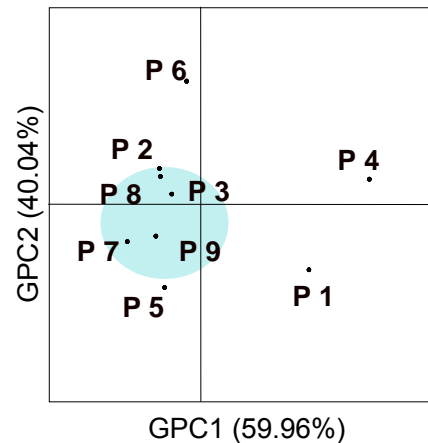
Flash Profile



Panel repeatability (3)

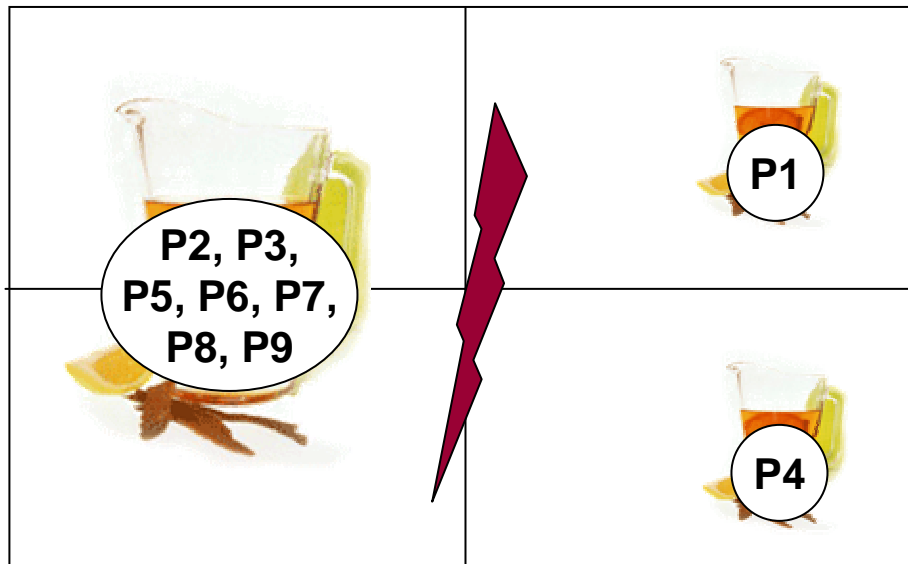
- **P8 and P9 are duplicated products:** were they perceived as similar by the panelists?

Projective Mapping



Product configurations (1)

- Global overview of the three GPA plots



Global correspondence
between the maps:

RV-coefficients:

RG / FP = 0.911

FP / PM = 0.8374

RG / PM = 0.8959



Product configurations (2)

- Detailed comparison: Product discrimination

	Repertory Grid	Flash Profile	Projective Mapping
Wilks' Lambda	0.004	0.005	0.489
F (observed value)	51.9 (p<0.0001)	49.2 (p<0.0001)	18.8 (p<0.0001)



The product discrimination is lower with PM than with RG and FP

Product configurations (3)

- Detailed comparison: Why the product discrimination is lower with PM than with RG and FP?



Only 2 dimensions?

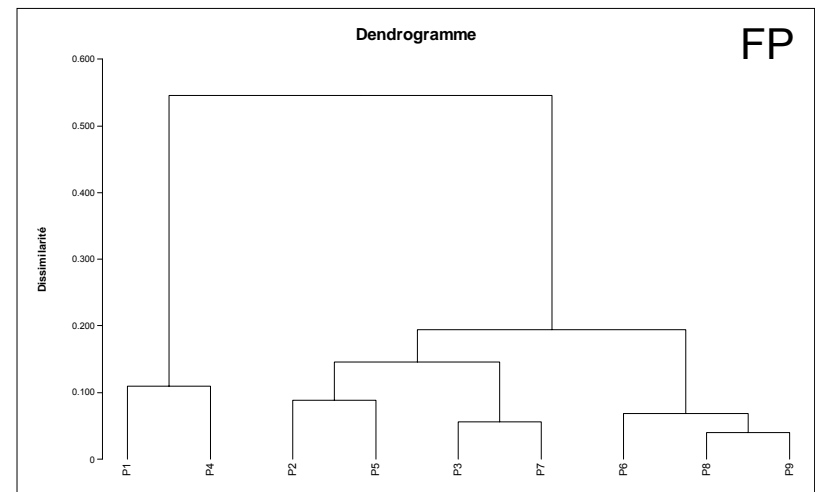
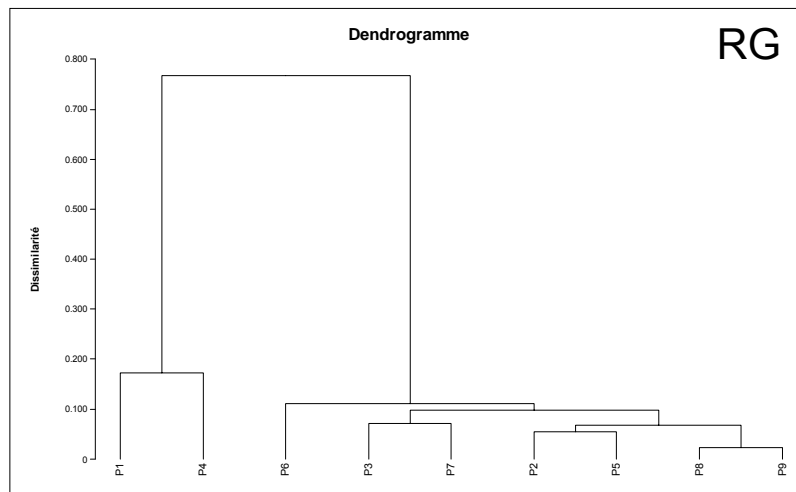
Difficult to understand?

Multidimensional perception to put in 2 dimensions?

Local positioning?
non euclidian space anymore

Product configurations (4)

- Detailed comparison: Product discrimination

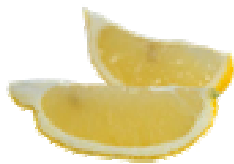


Ranking step: better than rating step to highlight the small differences between the products

Consumer vocabulary (1)

- Consumer vocabulary elicitation

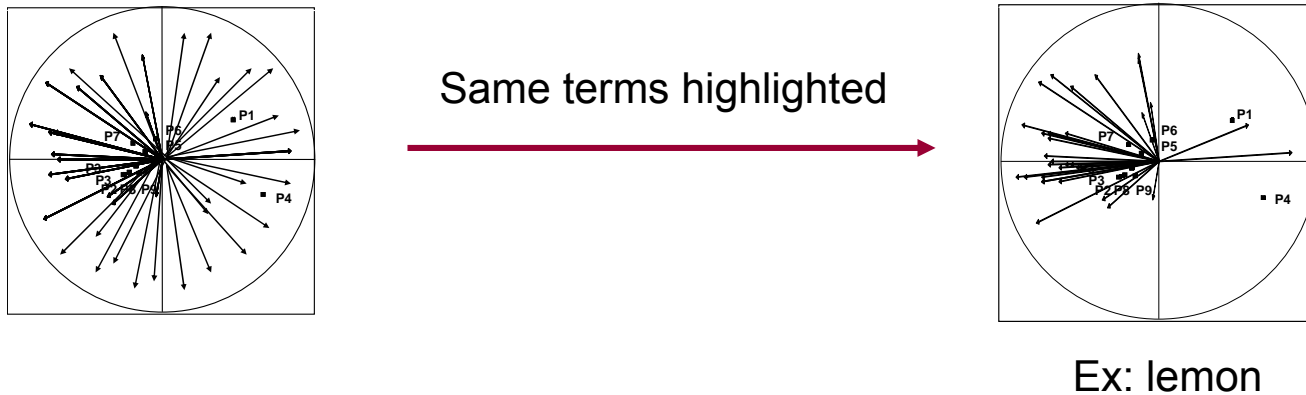
- Number of terms:
Repertory Grid & Projective Mapping > > Flash Profile
- Whatever the method: the same 5 descriptive terms most frequently elicited by assessors



Consumer vocabulary (2)

- Consensual use of terms

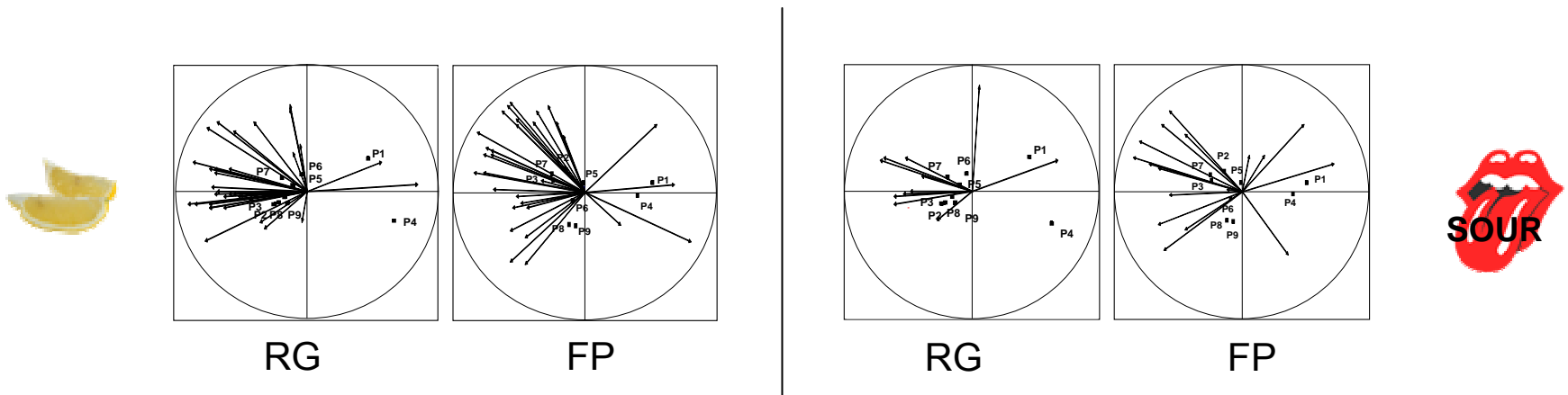
- In RG and FP: loadings of attributes obtained by GPA



- In PM: no loading of attributes → descriptive labels put after the positioning

Consumer vocabulary (3)

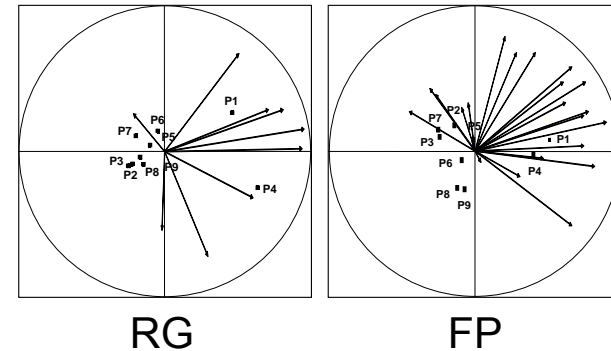
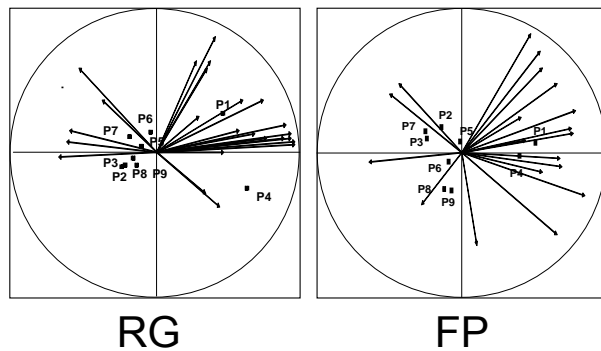
- Consensual use of Lemon and Sour



- Lemon and Sour point in the same sensory direction

Consumer vocabulary (4)

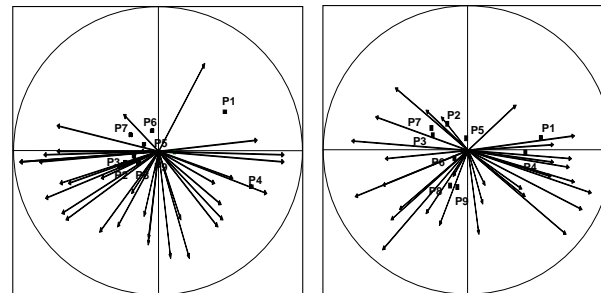
- Consensual use of Tea and Bitter



- Tea and Bitter point in the same sensory direction

Consumer vocabulary (5)

- No consensual use of Sweet



All the products are very sweet but not very different

Physiological saturation

Difference of perception due to interaction with flavour

Consumer vocabulary (6)

- Search for synonymous terms

- Litchi: descriptive term very employed whatever the method



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Conclusion

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- The method selection depends on the project objective:
 - **Projective Mapping**: Rough view of the product space + a lot of vocabulary
 - **Flash Profile**: Very accurate view of the product space + concise descriptive information
 - **Repertory Grid**: Accurate view of the product space + more exhaustive descriptive information
- The comparison with expert sensory profiling data could allow to define in a more objective way the subjective consumer description.
- Further studies are necessary in order to better understand the consumer terms which are not used in a consensual way.

Prospects

- Combine the advantages of RG and FP:
 - The bipolar construction of RG: increase the number of terms

&

- The ranking step of FP: highlight small differences



New hybrid method to be tested
with consumers

THANK YOU