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Methods for combining eye tracking and word association data to relate consumers' attentional processing and freely-elicited associations

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Food products (packaging)

What the consumer pays **attention** to,

what **information** has been **communicated**, and

which visual **elements** give rise to this processing

Brand Logo Colour Shape Size Format

Picture Nutritional info Main label Texture


2.5s

Watch the jam jar...

Your processing would look like this

To relate the attention that the packaging elements attracted to the immediate message that they conveyed

Case study: Jam jars

Stimuli

2^4

factorial design

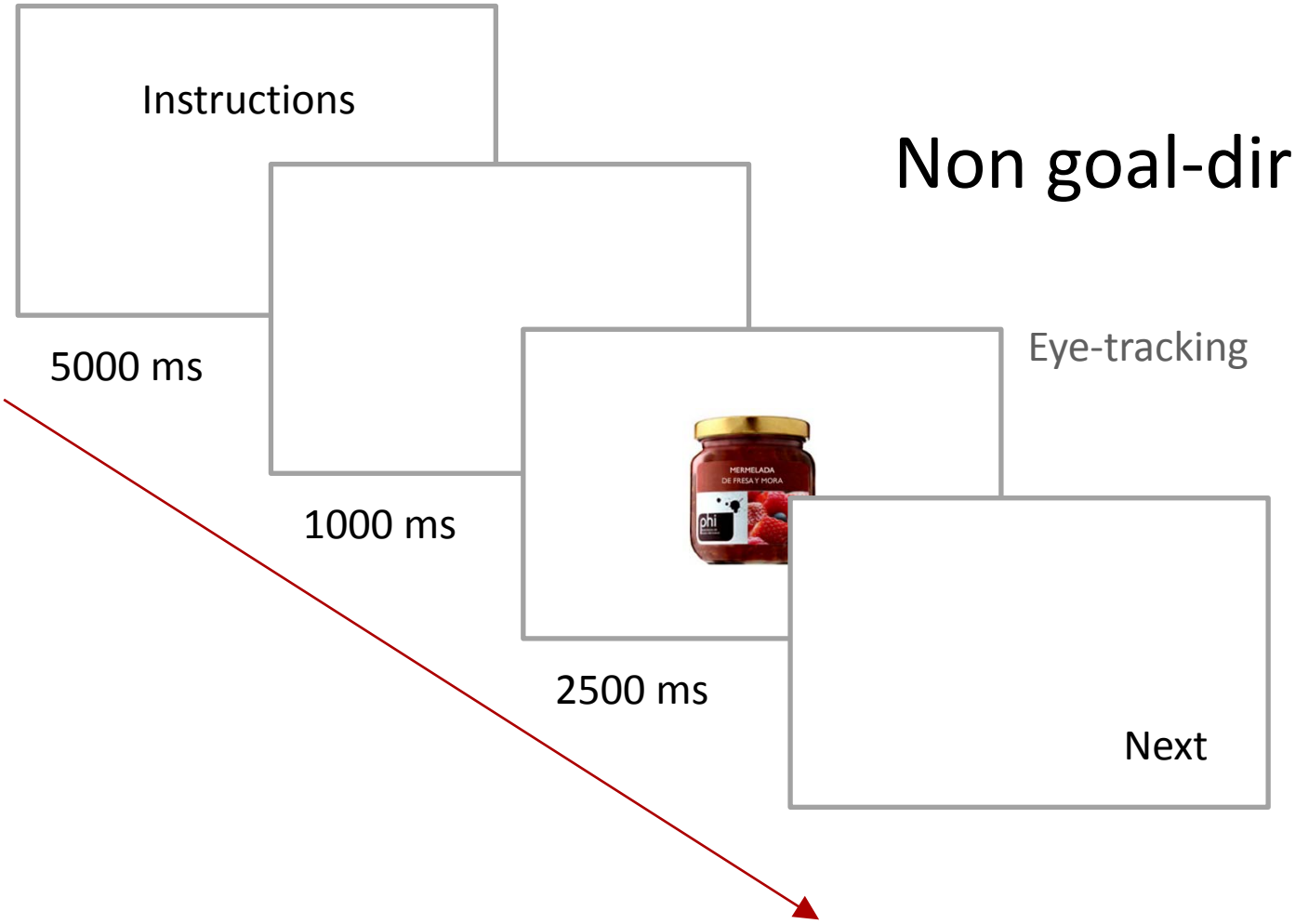
Shape: squared vs. rounded

Texture: ridged vs. smooth

Main ingredient information: photo vs. text

Inclusion of the **label 'natural'** vs. absence

Procedure



Non goal-directed task

Data analysis

Define 4 areas of interest (AOIs)

1. Photo/text area
2. Border
3. Logo
4. Main flavour label

Data obtained:

Total fixation duration for each AOI (ms)
Willingness to try ratings
Many associations (4x50x16=3200 words!)

So which variations had more impact?

Capturing or directing attention

Driving willingness to try

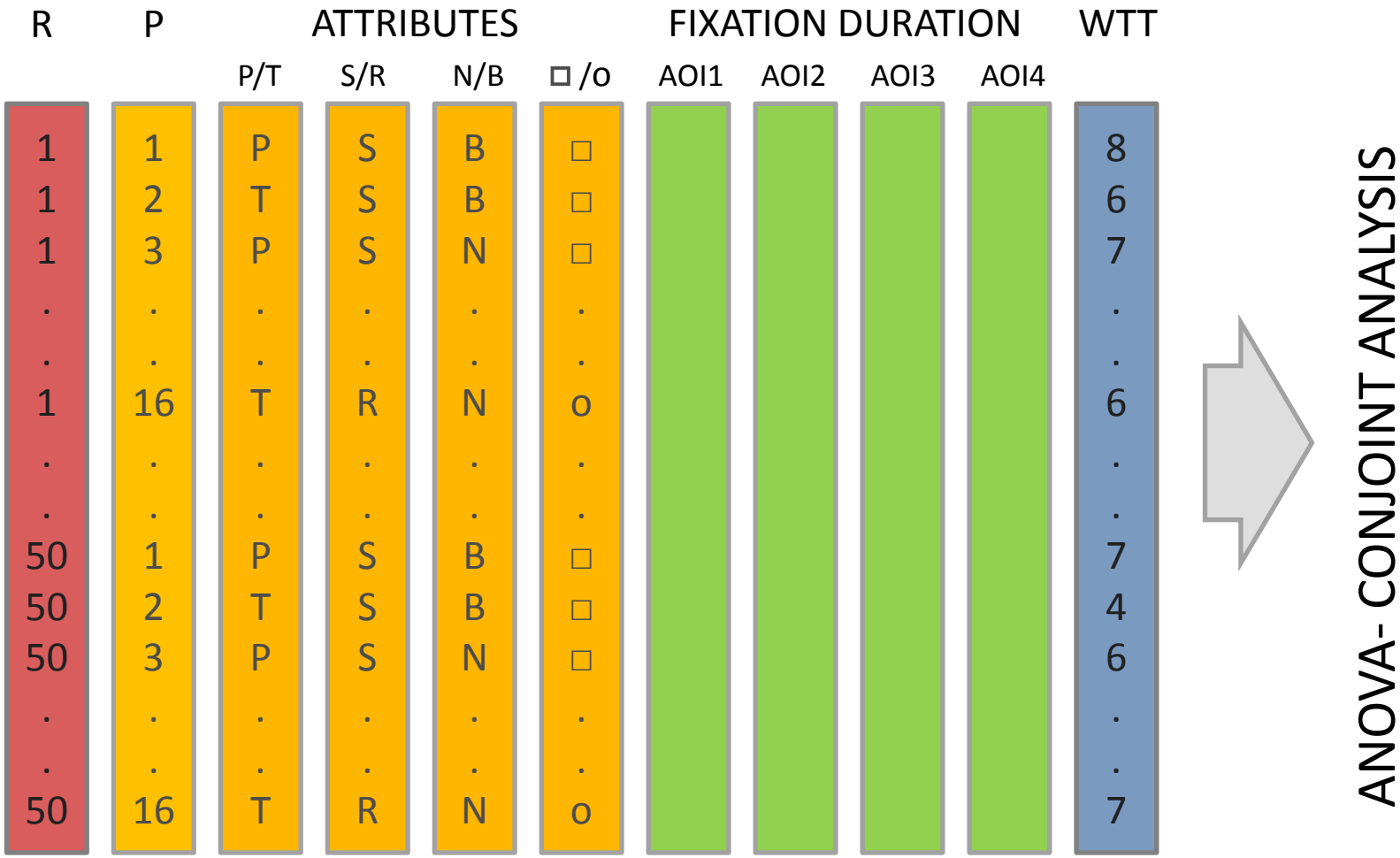

MERMELADA
DE FRESA Y MORA
phi


MERMELADA
DE FRESA Y MORA
natural
phi


phi


MERMELADA
DE FRESA Y MORA
phi

The impact of the variations



The impact of the variations

Mixed model ANOVA

Effects considered:
Random effects: consumer
Fixed effects: design variables

(and all possible pairwise interactions)

Regression modeling: Stepwise regression forcing the main effects and allowing only significant interactions to enter afterward, if the interaction is significant at $p < .01$. (Moskowitz & Gofman , 2004)

ANOVA- Conjoint results based on the selected models

The impact of the variations

Fixation data

Attributes and variations	AOI defined			
	Border	Photo/ text	Flavour label	Logo
Intercept (ms)	62	365	443	370
Photo/Text				
Relative importance (%)	12	**43*** **	18	40
Photo	-5.9	**86.0**	-13.2	-17.2
Text	5.9	**-86.0**	13.2	17.2
Shape (outline)				
Relative importance (%)	**25***	17	**41***	**27***
Squared	**12.5**	23.5	**-30.7**	**30.9**
Rounded	**-12.5**	-23.5	**30.7**	**-30.9**
Texture				
Relative importance (%)	**48*** **	**34*** **	32	5
Ridged	**24.2**	**-47.2**	24.2	-0.5
Smooth	**-24.2**	**47.2**	-24.2	0.5
Natural label				
Relative importance (%)	15	6	9	**28***
Blank	7.6	-8.2	7.1	**-31.9**
Natural	-7.6	8.2	-7.1	**31.9**

*** $p < .0001$; * $p < .05$

The impact of the variations

Willingness to try

Attributes and variations	WTT	Attributes and variations	WTT
Intercept (points)	5.88	**Photo/Text*Texture**	
Photo/Text		*Relative importance (%)*	**25*** **
Relative importance (%)	**59*** **	Photo*Ridged	**-0.28**
Photo	**0.66**	Photo*Smooth	**0**
Text	**-0.66**	Text*Ridged	**0.28**
Shape (outline)		Text*Smooth	**0**
Relative importance (%)	6		
Squared	-0.07		
Rounded	0.07		
Texture			
Relative importance (%)	4		
Ridged	-0.04		
Smooth	0.04		
Natural label			
Relative importance (%)	6		
Blank	-0.07		
Natural	0.07		

*** $p < .0001$

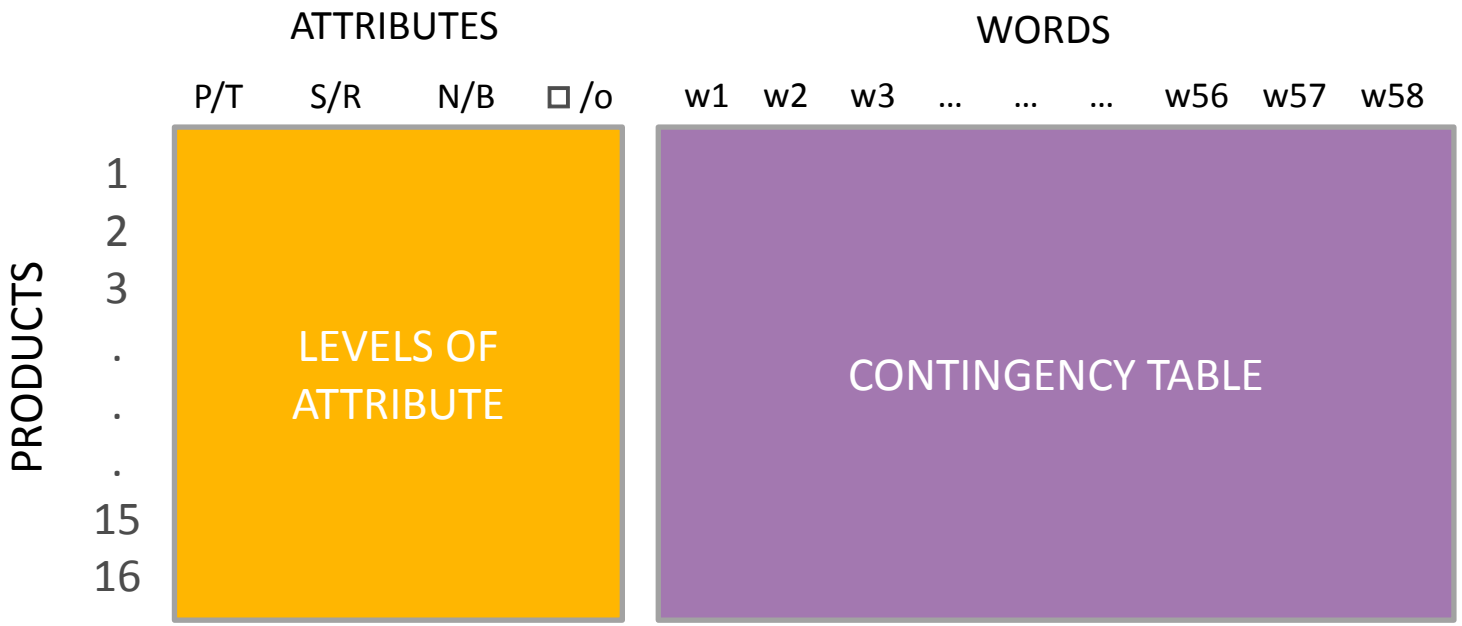
And what was being communicated?

Associations

Word association

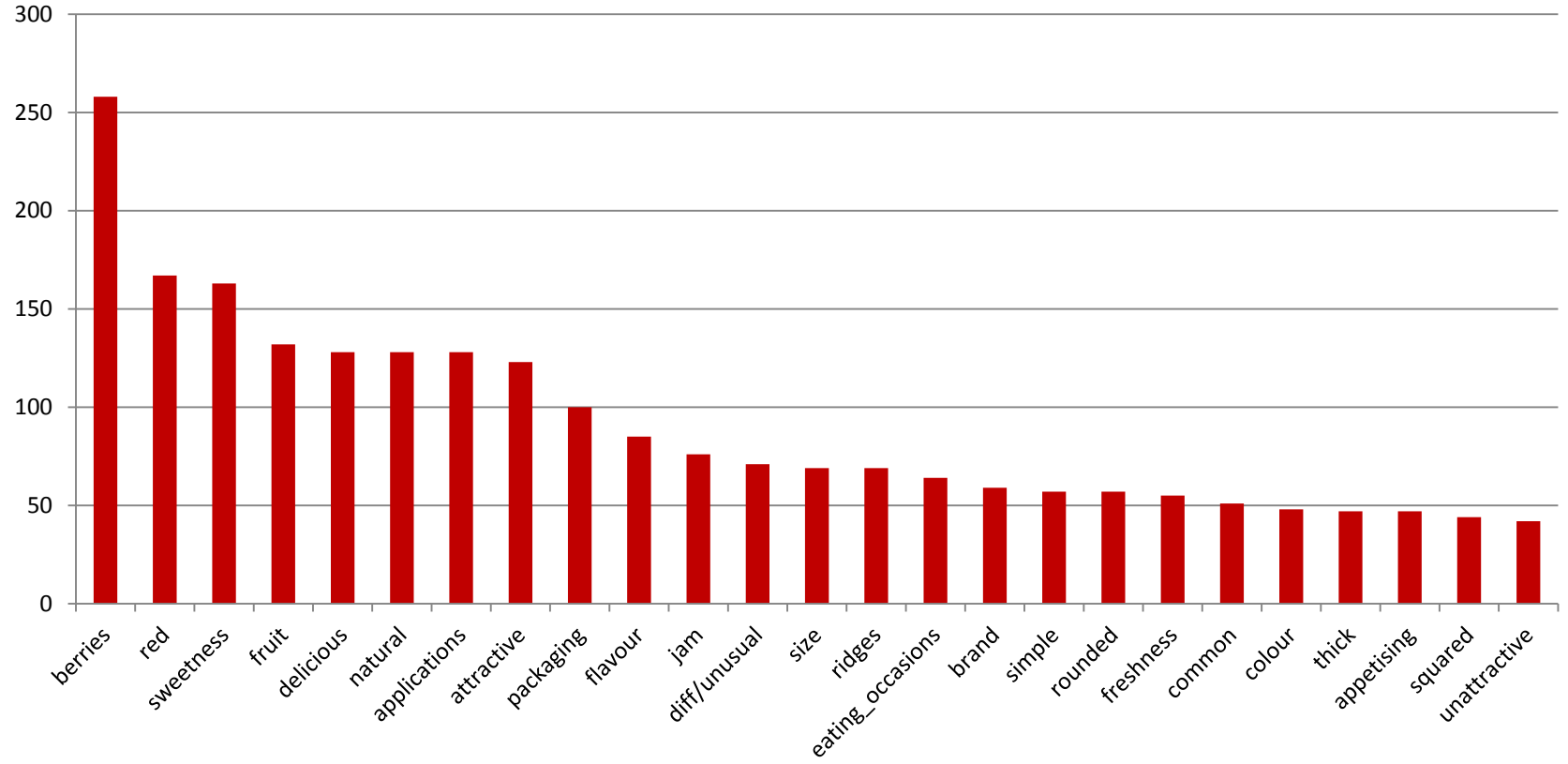
3200 words → Categorisation + cutoff frequency → 58 categories

- Sensory
- Hedonic
- Emotional
- Packaging
- Colours
- Fruits...



Associations

Frequency of words for all products



Associations

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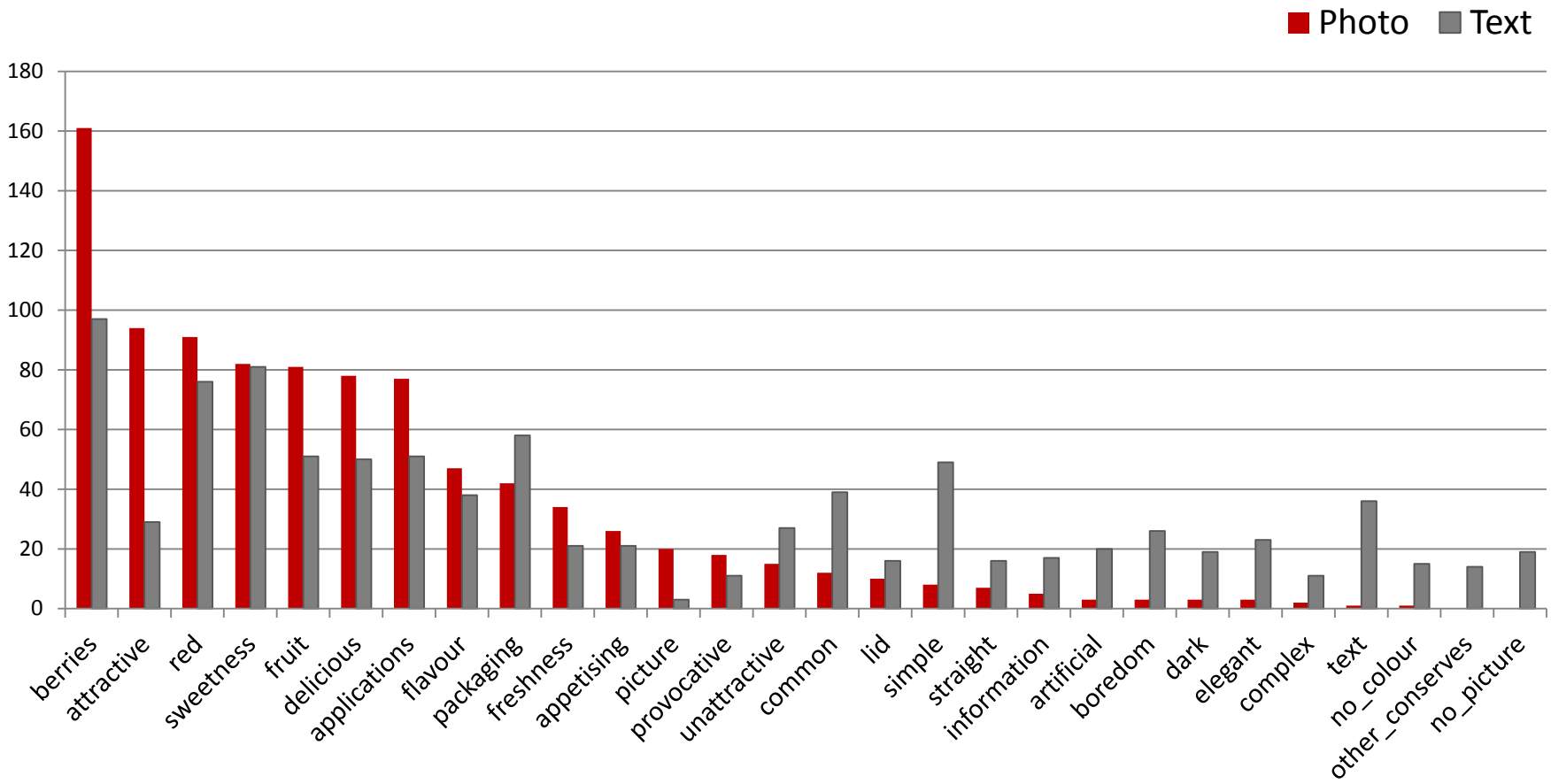
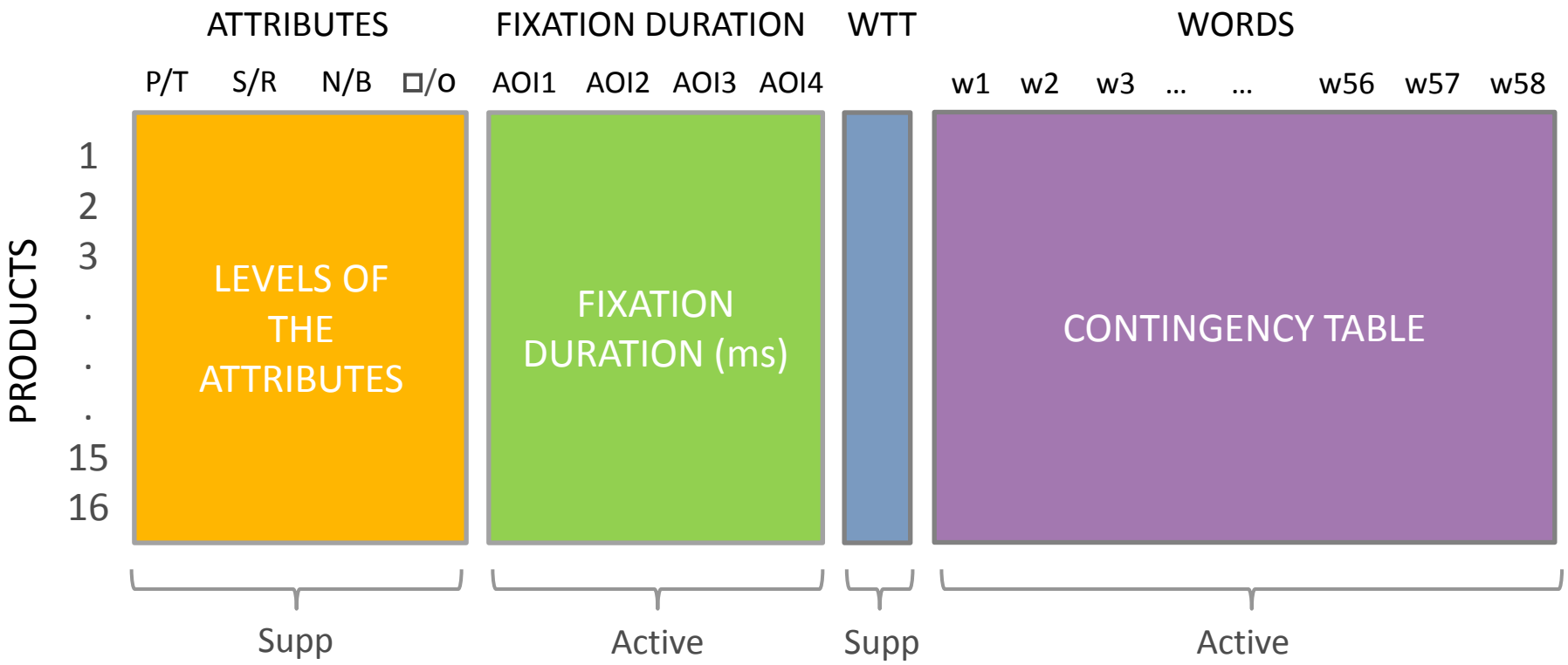


…so in combination,
what can we infer?

Combination of the data

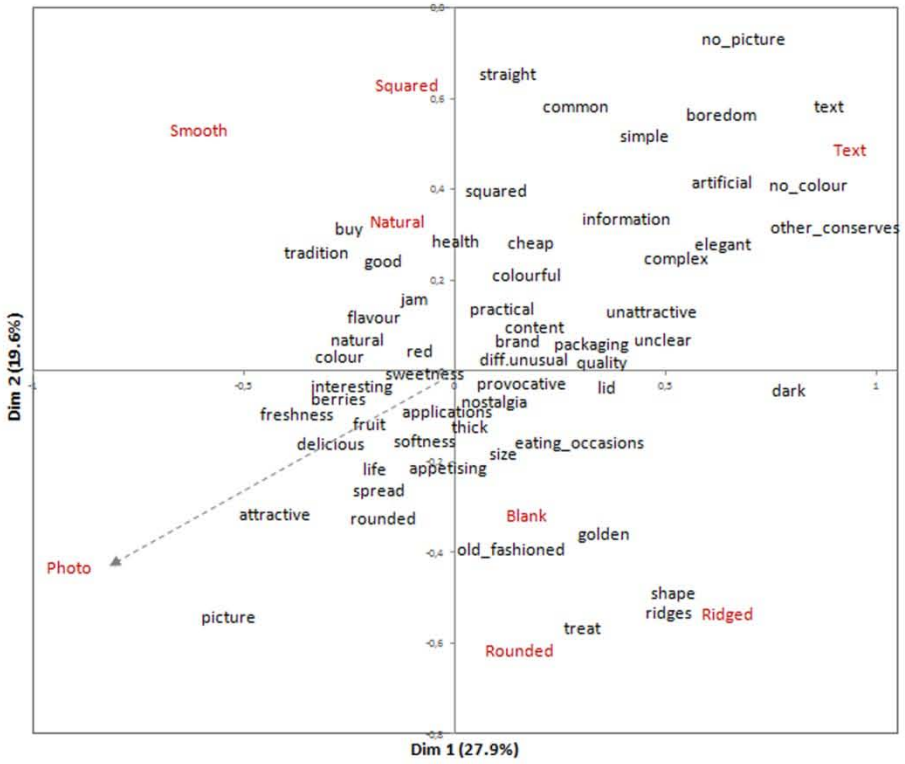
Multiple Factor Analysis (MFA)

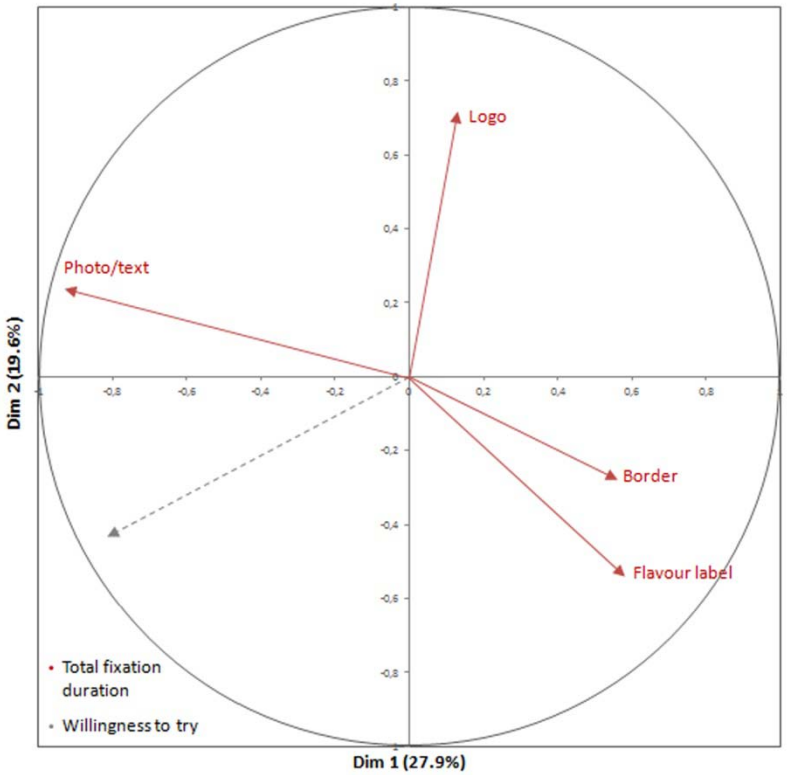
(Bécue-Bertaut, & Pagès, 2008)



Combination of the data

Results from MFA





Combination of the data

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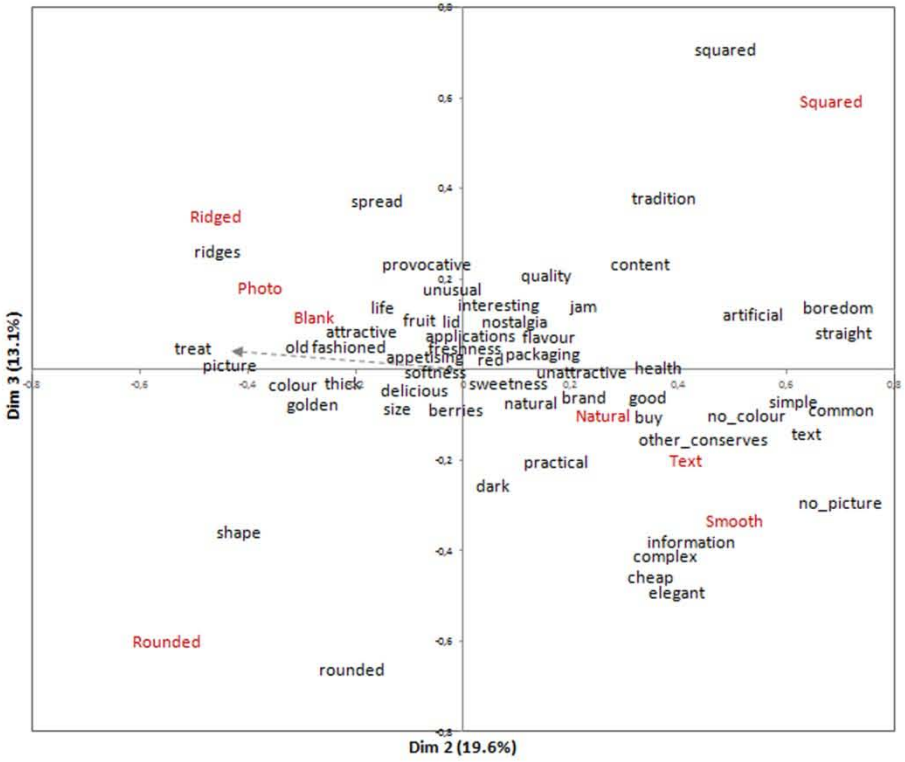

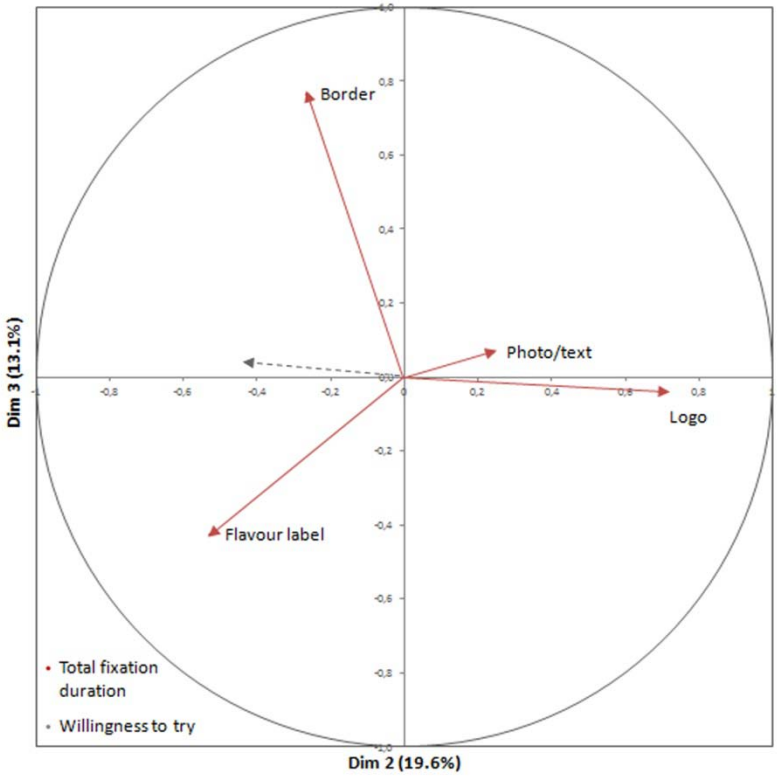

Discussion

Procedure methods

• ET: Information that the participant may potentially not be consciously aware of (and/or have difficulty in articulating).

• WA: Access to a participant's conscious thoughts and associations after having considered and evaluated each of the products individually.

Analysis methods

• Conjoint analysis: Determine the statistical contributions of each element.

• MFA: Integrate, balance, and interpret the rich mixed set of data (freely-elicited textual data, fixation durations, and WTT ratings) handled in this study.

Conclusions

The objective was to relate the attention that the package elements attracted to the immediate message that they conveyed in a non goal-directed task.

Considerations of the design

- 2D images
- Non-goal directed task
- Restricted amount of time of the task
- Procedure ET-WA-WTT

For the future...

- More ecologically valid? 3D images? Recording?
- Other sensory stimuli as sources of variation?
- Consider time of elicitation?
- Are there other ways of looking at these new types of data?

THANKS!

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