

# Impact of cross-modal touch/smell congruence and familiarity on cosmetic product evaluation

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## Introduction:

### Context:

Cross-modal association between sensory modalities is a natural phenomenon in the perception of our environment [1]. For a cosmetic product, touch and smell appear as the two major sensory modalities involved in product perception. Until now, only the influence of interaction between a same fragrance note of different concentrations and a texture on a whole product perception has been studied [2].

### Purposes:

- To explore:
- 1)The influence of interaction between different olfactory notes and textures on product perception;
  - 2)The mechanisms underpinning these effects: how congruence between olfactory notes and textures influences the whole product appreciation; whether repeated use may modify congruence evaluation as well as a whole product appreciation.

### Designs:

- Step 1: free description of perception about selected cosmetic formula & fragrances
- Step 2: cross-modal indexed congruence olfactory and tactile perceptions
- Step 3: evaluation of emotional reactions to different formula texture/fragrance combinations
- Step 4: product global evaluation before and after 5 days home use

## Materials & Methods:

- **Participants:** 29 Subjects (24 women and 5 men)
- **Stimuli:** 4 Textures, 6 Fragrances, 10 Combination products

Textures	4 Textures			
	Cream	Skin balm	Skin-gel	Dry oil
Liquid (-)	+	+	-	-
Solid (+)	-	-	+	+
Aqueous (-)	-	+	-	+
Oily (+)	+	-	+	-



### 10 combination product (texture+fragrance)

Texture	So-called congruent associations	So-called incongruent associations
Cream	Freesia / Grape	Coffee
Skin-gel	Bamboo / Bergamot	Date
Skin-Balm	Date	Bamboo
Dry oil	Bergamot	Grape

### Procedure / Evaluation

1. **Free description:** "Please describe in your own words anything that the stimulus causes or evokes in you".
2. **Indexed cross-modal congruence with 5-points categorical scale**

Olfactory experience with tactile descriptors			Tactile experience with olfactory descriptors		
Slight	Hot	Wet	Floral	Spicy	Aromatic
Heavy	Cold	Liquid	Fruity	Woody	Citrus
Smooth	Hard	Viscous	Nut	Vanilla	Tea
Rough	Soft	Creasy	Lemon	Caramelized	Animal
Creamy	Powdery	Sticky	Herbal	Grilled	Smoked
Oily	Dry	Doughy	Fresh	Minty	Medicinal

3. **Evaluation of combined products (texture/fragrance) with visual analog scale**
4. **Home-Use Test:** 2 products for daily use for 1 week each, with a 2 days break in-between. The order of the two products uses was counterbalanced over participants.

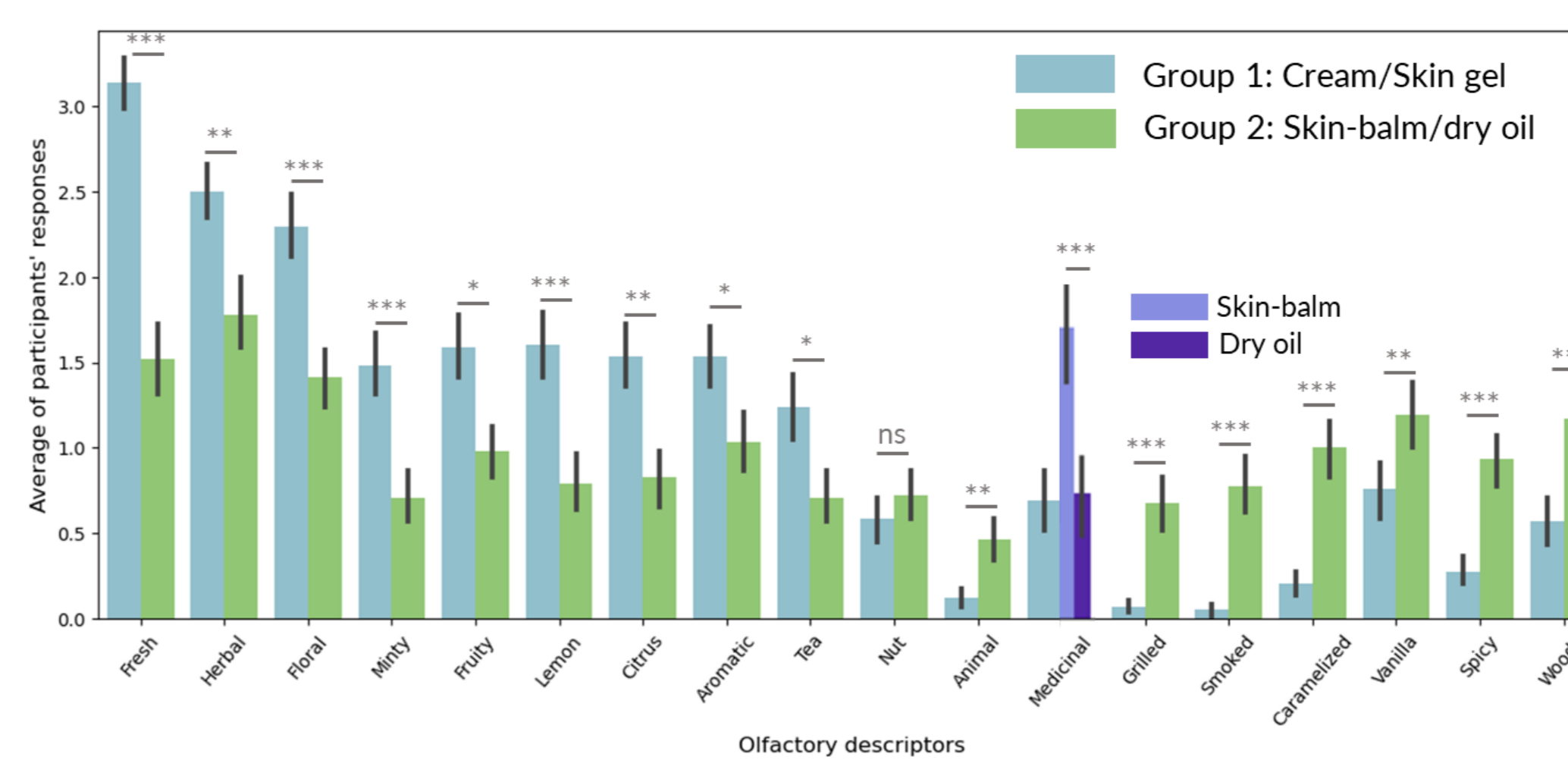
Week	Week 1								Week 2								
	D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	D1	D2	D3	D4	D5	D6	D7
Product 1 application																	
Product 2 application																	
Tasks																	
Daily report using SAM method																	
Mood ranking (before/after)		x2	x2	x2	x2	x2	x2	x2			x2	x2	x2	x2	x2	x2	x2
Judgement report																	

## References:

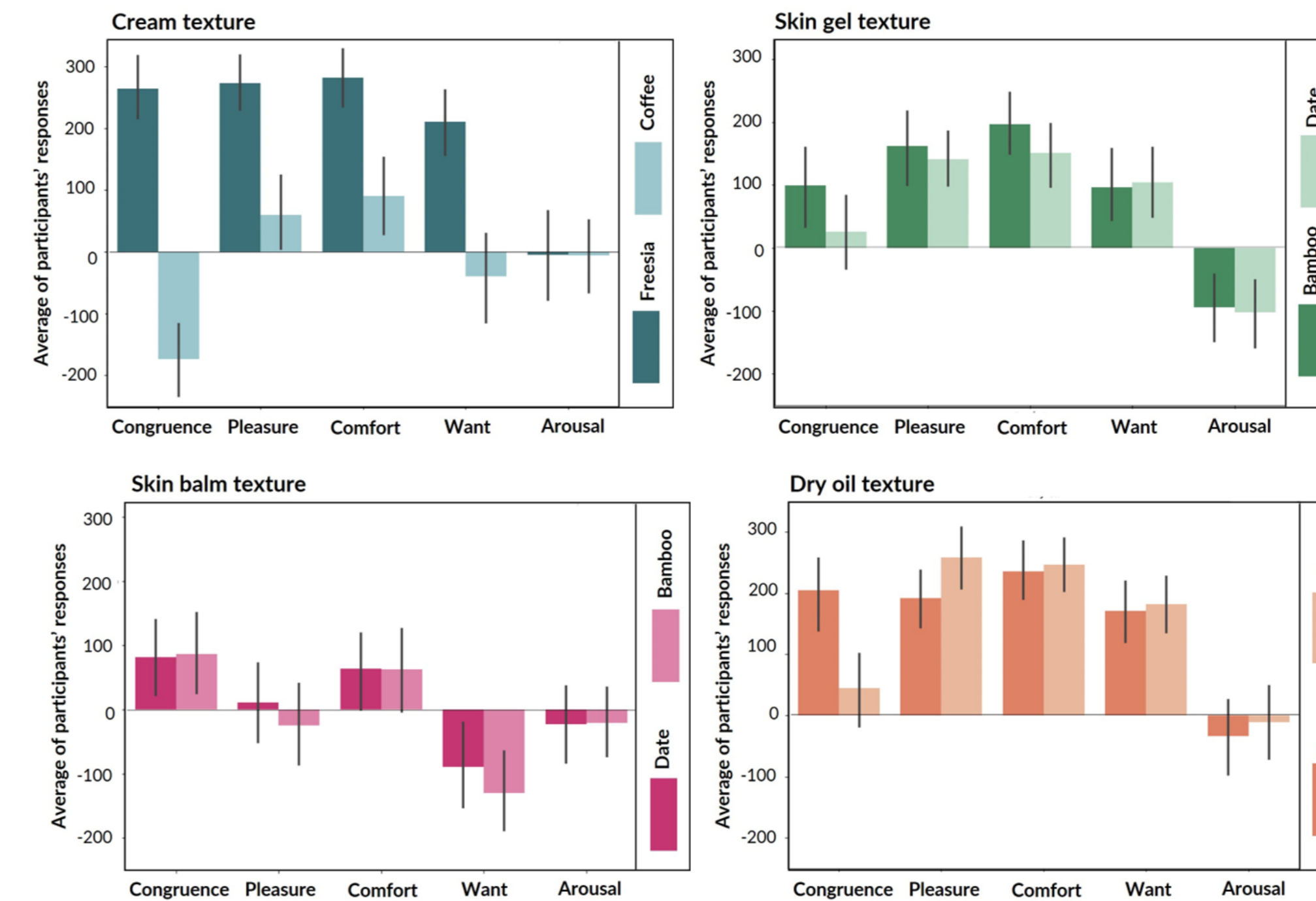
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- [4] Gouizi, K., F. Bereksi Reguig, et C. Maaoui (2011) Emotion Recognition from Physiological Signals. *Journal of Medical Engineering & Technology* 35 (6-7) 300-307.
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## Results & Discussion:

### Cross-modal congruence: texture-fragrance



### Average of participants' responses for congruent and incongruent products of each texture



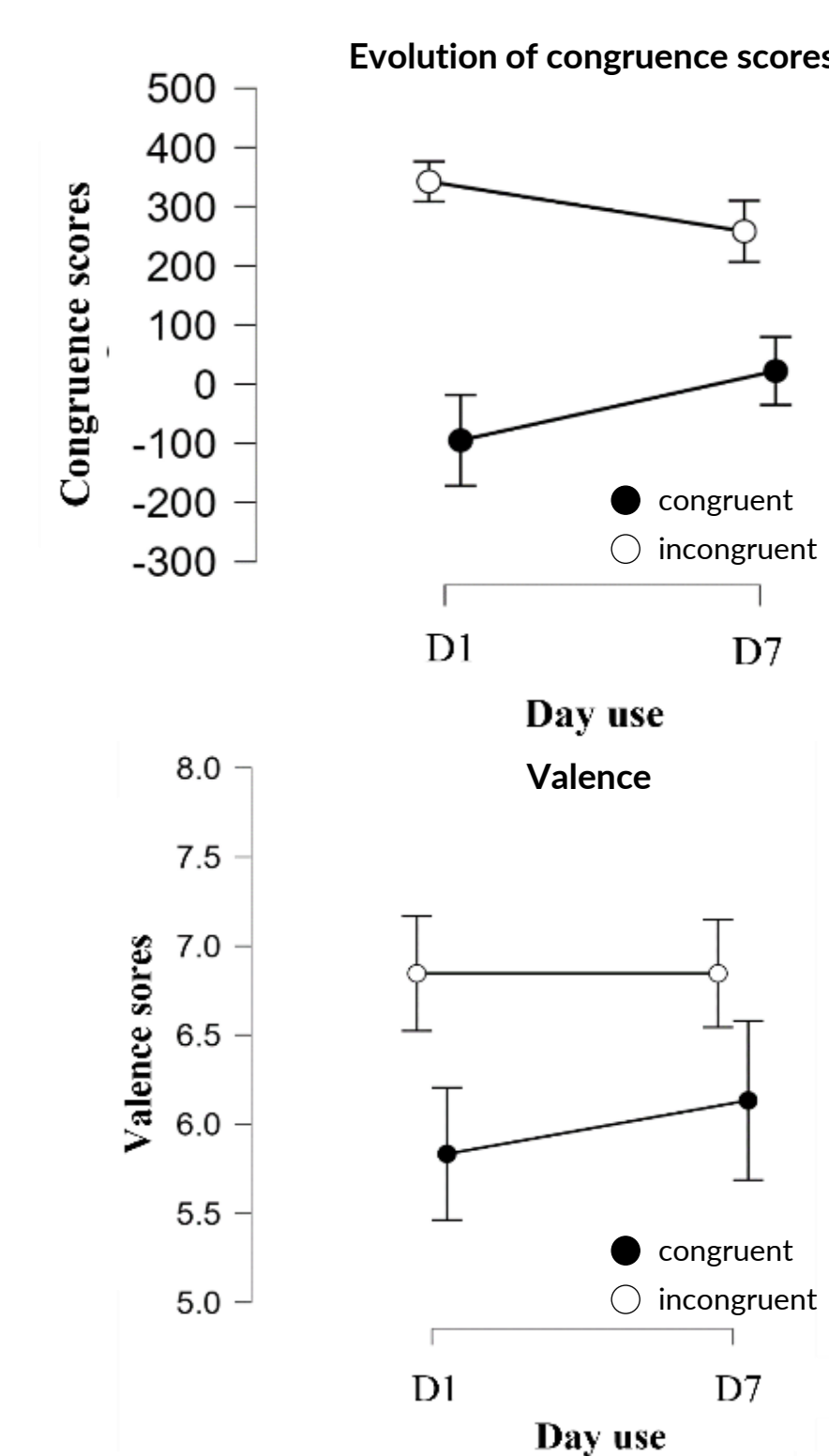
### Combined products evaluation

#### Pearson's correlations

		Pearson's r	
Cream	Pleasure	0.495	***
	Comfort	0.563	***
	Want to use	0.577	***
Gel	Pleasure	0.428	**
	Comfort	0.362	**
	Want to use	0.423	**

\* p < .05, \*\* p < .01, \*\*\* p < .001

### Evolution of congruence scores



## Conclusions:

- **Cross-modal Congruence** is an important dimension to evaluate cosmetic products. The congruence/incongruence between touch and smell could predict the *pleasure* and *comfort* cued by cosmetic products and *want to use* it, especially with cream and gel textures.
- **Touch/smell congruence** is a dynamic process and could be evolved during familiarization processes.
- **The low touch/smell congruence** is not necessarily a negative point, since the evaluation of congruence depends on complex processes like habituation [3], familiarity, mood state, etc.. Low congruence could be associated with the feeling of novelty which could evoke curiosity, surprise, attention of consumers and exploration urges of the products.
- **The calming effect** of cosmetic products seems mostly determined by the texture of the product whichever fragrance is combined.
- **The Emotional benefits** of cross-modal combined products can be further explored with longer home use and with psychophysiological measurements [4,5].

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