

Emotional connotations of consumers in blind sensory evaluation of chocolates with normal and alternative sweeteners

Sofie Lagast¹, Hans De Steur¹, Joachim Schouteten¹, Sara De Pelsmaeker¹, Xavier Gellynck¹

¹Ghent University, Department of Agricultural Economics, Coupure Links 653, Gent, Belgium

Sofie.Lagast@UGent.be, tel: +32 9 264 5945, fax: +32 9 264 6246, www.sensolab.be

Objectives

Does consumer’s emotional conceptualization and sensory evaluation differ between chocolates with regular sugar and alternative sweeteners?

AIM

- ✓ Compare emotional conceptualizations of consumers after eating dark chocolate with regular sugar versus alternative sweeteners
- ✓ Contribute to better understanding of the relationship between emotional conceptualizations and sensory attributes in dark chocolate with regular sugar versus alternative sweeteners.

Materials & methods

PRODUCTS:

Three dark Belgian chocolates



CONSUMER TEST

- Attitude and behaviour
 - Eating habits of chocolate: consumption and preference of type of chocolate, frequency of consumption
 - Health and Taste Attitude Scale (HTAS)
 - Dutch Eating Behaviour Questionnaire (DEBQ)
- Sensory evaluation
 - Hedonic liking
 - 7-point Likert scale
 - Taste and texture
 - 5-point just-about-right scale (JAR)
- Emotional conceptualizations
 - Check-all-that-apply (CATA)
- Socio-demographic (age, gender, BMI, diet behaviour)

RESPONDENTS

219 Belgian subjects (42% ♂, 58% ♀)

Results

SENSORY EVALUATION

	Regular		Alternative sweeteners					
	Chocolate – regular sugar		Chocolate – tagatose		Chocolate – stevia		Total	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Overall liking	4.67 ^a	1.46	4.49 ^a	1.39	3.11 ^b	1.41	4.09	1.58
Sensory attributes								
Texture	0.02	0.57	-0.06 ^a	0.63	0.12 ^b	0.66	0.03	0.62
Taste								
- Sweetness	0.15 ^a	0.73	-0.16 ^b	0.77	-0.73 ^c	0.87	-0.25	0.87
- Bitterness	-0.23 ^a	0.71	0.10 ^a	0.79	0.29 ^b	1.05	-0.01	0.89
- Intensity off flavour	-0.05	0.68	-0.10	0.75	0.07	1.07	-0.03	0.85
- Duration off flavour	-0.04 ^a	0.71	-0.05 ^a	0.77	0.24 ^b	0.94	0.05	0.82

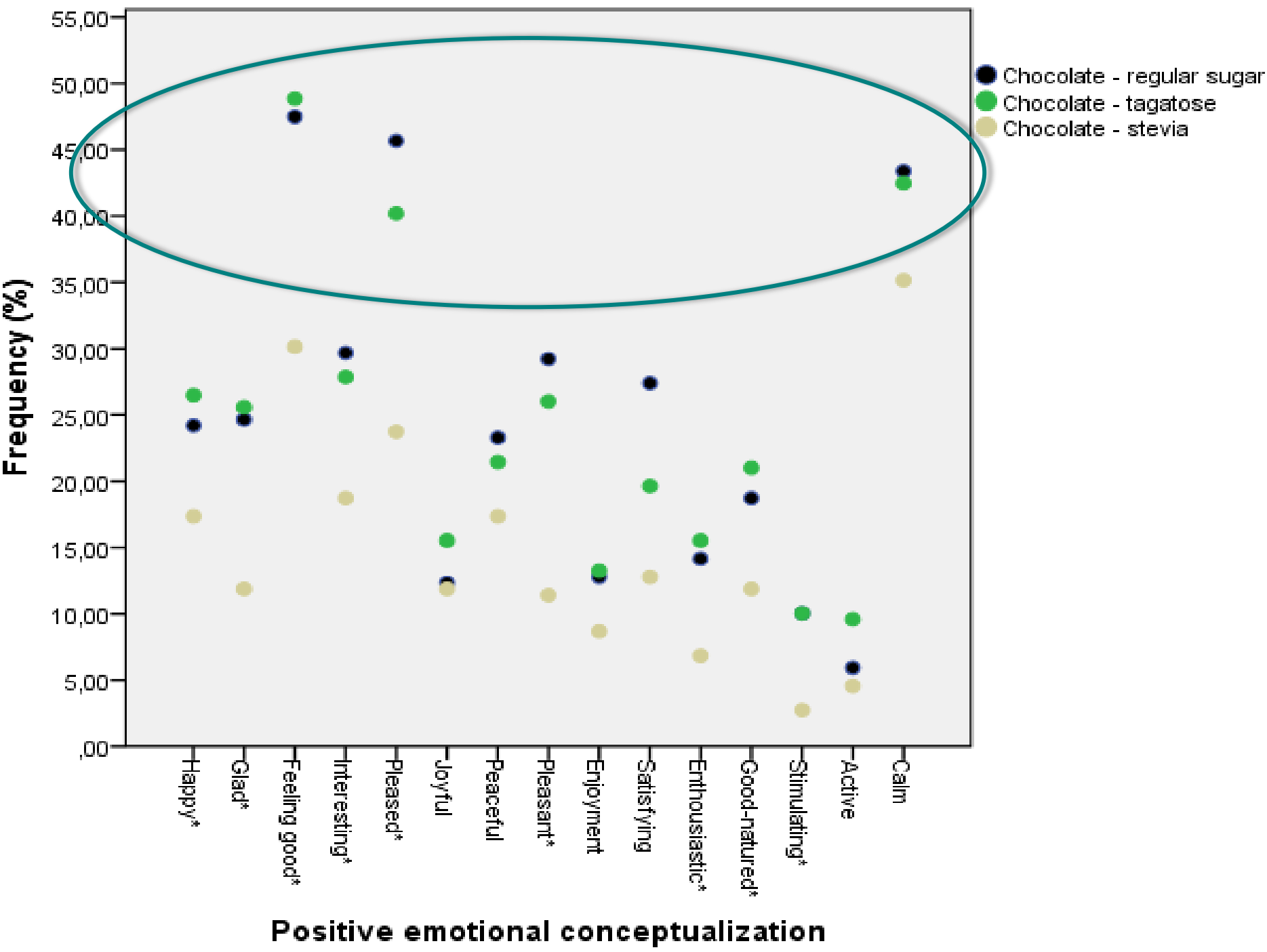
^{a,b} significantly different (p<0.05) Tukey HDS Post Hoc (liking) – Dunett’s T3 Post Hoc (sensory attributes); liking 1-7, sensory attributes -2 to 2, *** significance p<0.01

Overall liking	Texture	Sweet taste	Bitter taste	Duration off flavour
chocolate – stevia < chocolate – regular sugar chocolate – tagatose	chocolate – stevia > chocolate – tagatose	chocolate – regular sugar > chocolate – tagatose > chocolate – stevia	chocolate – stevia > chocolate – regular sugar chocolate – tagatose	chocolate – stevia > chocolate – regular sugar chocolate – tagatose



EMOTIONAL CONCEPTUALIZATION

	Regular		Alternative sweetener					
	Chocolate - regular sugar		Chocolate - tagatose		Chocolate – stevia		Total	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
# Positive	3.69 ^a	3.05	3.63 ^a	3.16	2.25 ^b	2.74	3.19	0.12
#Negative	0.69 ^a	1.08	0.78 ^a	1.06	1.56 ^b	1.43	1.01	1.26
Emotional conceptualization score	1.25 ^a	0.52	1.30 ^a	0.56	1.59 ^b	0.62	2.18	3.77

***P<0.01, Repeated measures ANOVA, ^{a,b} significantly different (p<0.05) Paired t-test

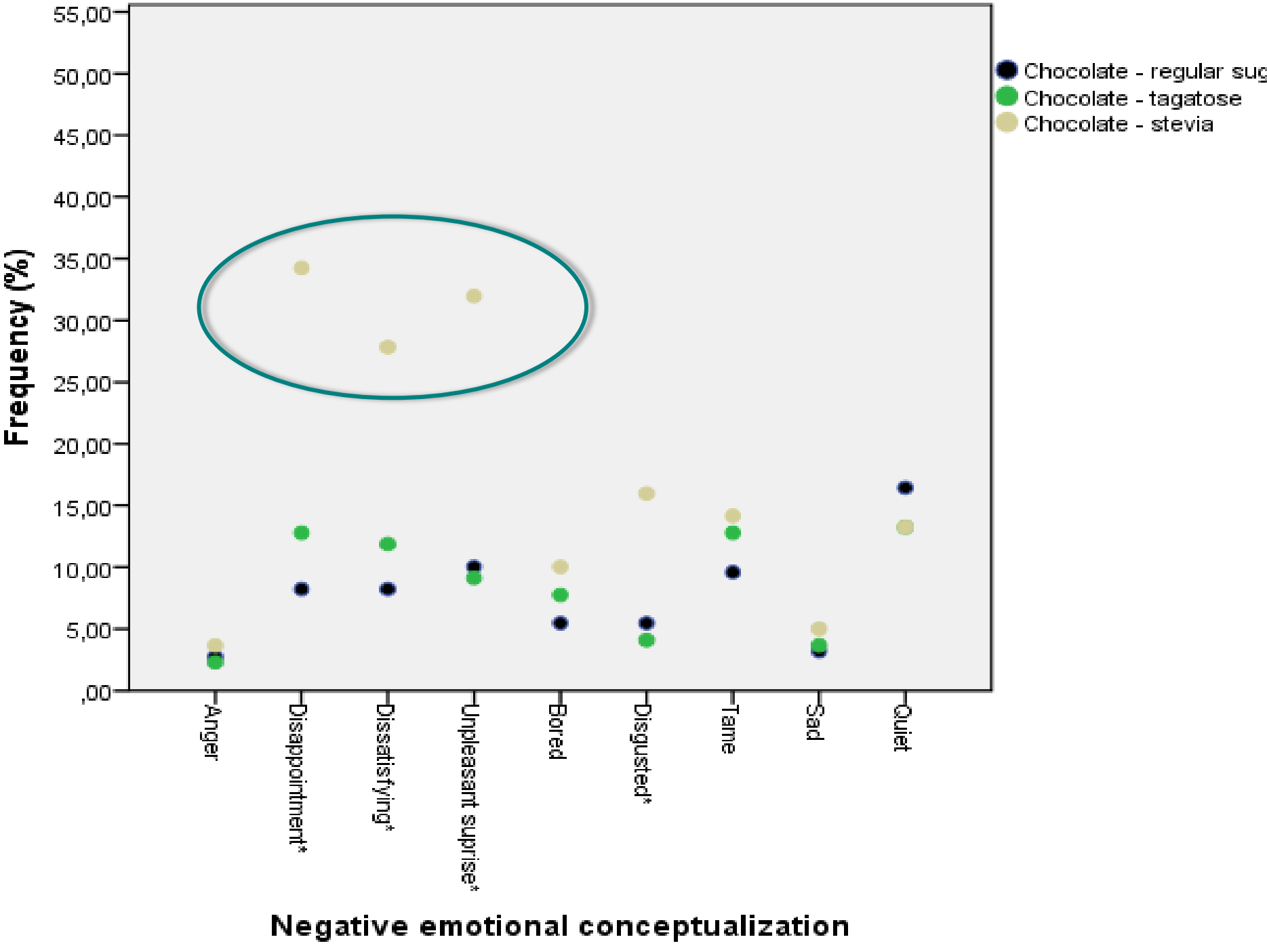


Positive emotional conceptualizations:




high frequency of positive emotional conceptualizations

“feeling good” and “pleased”



Negative Emotional conceptualizations:



high frequency of negative emotional conceptualization

“disappointment”, “dissatisfying” and “unpleasant surprise”

Conclusions

Does consumer’s emotional conceptualization and sensory evaluation differ between chocolates with regular sugar and alternative sweeteners? Yes, but also significant difference between type of sweeteners: tagatose and stevia.

Chocolate with stevia differed significantly from chocolate with regular sugar and chocolate with tagatose in terms of:

- ✓ Sensory evaluation
 - ✓ Overall liking: chocolate with the alternative sweetener stevia was significantly lower than the two other samples.
 - ✓ Sweet taste: all chocolates differ significantly, with chocolate with regular sugar the sweetest and chocolate with stevia the least sweet.
 - ✓ Texture: significant difference is observed between both alternative sweeteners: tagatose and stevia.
- ✓ Emotional conceptualizations: significant differences between positive and negative emotional conceptualizations of the different chocolates. Chocolate with stevia is most associated with negative emotional conceptualizations.

Roininen, K., Lähteenmäki, L., & Tuorila, H. (1999). Quantification of consumer attitudes to health and hedonic characteristics of foods. *Appetite*, 33(1), 71-88.
Van Strien, T., Frijters, J. E., Bergers, G., & Defares, P. B. (1986). The Dutch Eating Behavior Questionnaire (DEBQ) for assessment of restrained, emotional, and external eating behavior. *International Journal of Eating Disorders*, 5(2), 295-315.
Ng, M., Chaya, C. & Horta, J. (2013) Beyond liking: Comparing the measurement of emotional response using EsSense Profile and consumer defined check-all-that-apply methodologies. *Food Quality and Preference*, 28, 193-205