

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

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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% ♀)

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

Results

SENSORY EVALUATION

	Regular		Alternative sweeteners				Total	
	Chocolate – regular sugar		Chocolate – tagatose	Chocolate – stevia			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

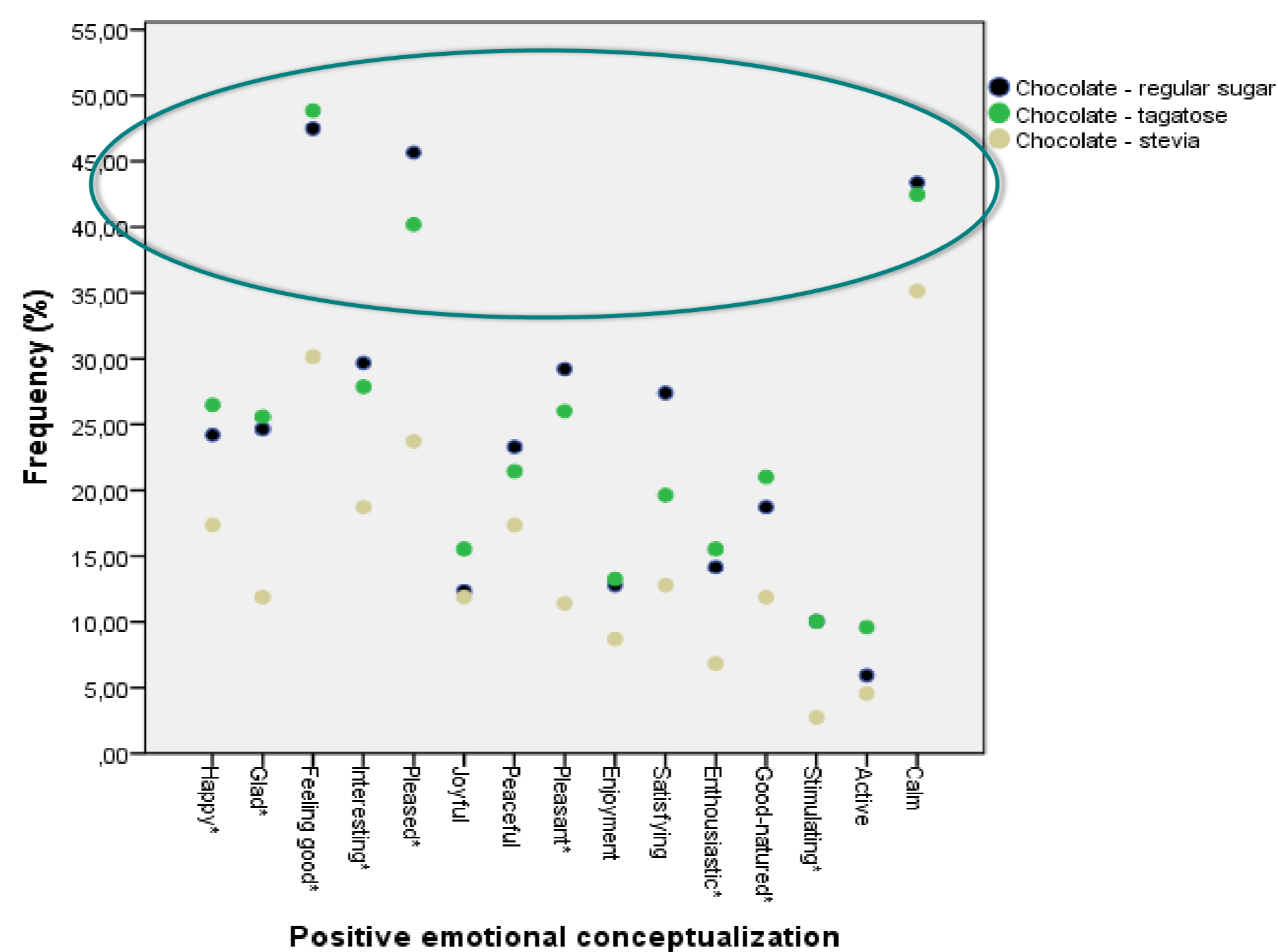
^{a,b,c} significantly different (ps0.05) Tukey HDS Post Hoc (liking) – Dunnett's T3 Post Hoc (sensory attributes); liking 1-7, sensory attributes -2 to 2, *** significance p<0.01

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				Total	
	Chocolate - regular sugar		Chocolate - tagatose	Chocolate – stevia			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 (ps0.05) Paired t-test

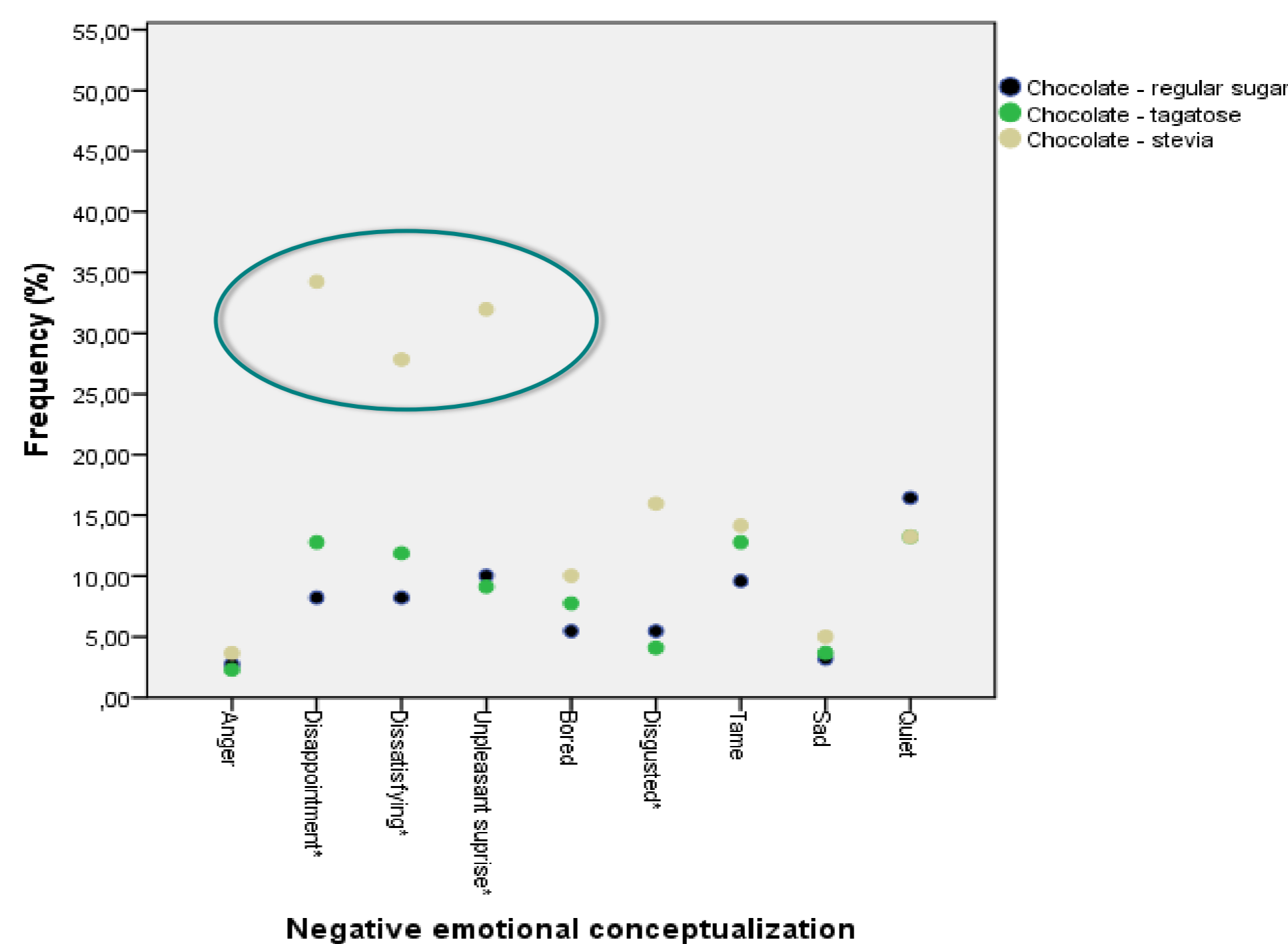


Positive emotional conceptualizations:

Regular sugar, Alternative sweeteners

high frequency of positive emotional conceptualizations

"feeling good" and "pleased"



Negative Emotional conceptualizations:

Alternative sweeteners

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.