

Overcoming consumption barriers for conscious food products: The role of vivid sensory imagery.

1 Conscious consumption – concepts and challenges

The tremendous increase in consumers' consumption of goods and services over the last decade came along with severe damages to the environment (Chen & Chai, 2010).

Concepts such as sustainable development, eco innovation, and green consumption base on the desire to satisfy the needs of the present without risking that future generations might not be able to fulfill their needs (Hauff, 1987).

Scholars conclude that there is a lack of knowledge about the reasoning and justifications regarding conscious consumption behavior, particularly, why consumers would or would not act consciously in certain consumption situations (Belk, Devinney, and Eckhardt, 2005).

The idea of conscious consumption entails major challenges arising at the interface between product development, marketing, consumer science and sensory science. Besides low availability, high prices and the lack of consumer trust in the respective products (Joshi & Rahman, 2015), another explanatory approach for prevailing consumption barriers refers to the existence of so-called lay theories, attributing, for instance, lower sensory pleasure and lower effectiveness to conscious products.

Moreover, the concentration on conscious consumption often lets forget that it is, above all, the non-demonstrative routine consumption, that can be associated with high environmental consumption (Goulden et al., 2014).

Against this background, the present paper focuses on understanding and combating lay theory based consumption barriers towards conscious (*sustainable, organic and regional*) food products as examples for non-demonstrative routine consumption.

2 Barriers towards conscious food consumption: the role of sensory appeal

Though up to 65% of consumers report intentions to buy purpose-driven brands that advocate sustainability, only about 26% actually do so (White, Hardisty, and Habib, 2019). Nevertheless only little work focuses on the role of the perceived sensory appeal of conscious products in forming or removing consumption barriers and extant studies come to contradictory conclusions.

Consumers tend to categorize products as either healthy or unhealthy based on the products' attributes (Rozin, Ashmore, and Markwith, 1996) and associate sustainability with higher perceived health (Verain, Sijtsema, and Antonides, 2016). This expected positive

correlation between health and sustainability might be due to the fact that consumers “often encounter health and sustainability together in products” (Cho & Baskin, 2018).

Similar to sustainable food items, also organic and regional food is associated with higher healthiness than conventional food. (Petrescu & Petrescu-Mag, 2015). Regional food is believed to be healthier, fresher and more sustainable than conventional food (Darby, Batte, Ernst, and Roe, 2006; Henseleit, Kubitzki, and Teuber, 2007).

Empirical work proposes that if consumers encounter different product attributes together over time, the associations between them may become automatic, so that consumers may predict a positive correlation between attributes (Bargh & Chartrand, 1999) and reinforcing consumers' own biases (Cho & Baskin, 2018).

On the one hand, some studies provide reason to assume that organic production may be associated with better taste, and that only if expectations are not met, this might raise potential barriers to consumers' repurchase intentions (Grunert, Bredahl, and Brunsø, 2004). Similarly, scholars suggest that consuming green products should result in increased enjoyment of the accompanying consumption experience, known as greenconsumption effect (Tezer & Bodur, 2019).

The strong association of sustainable, organic and regional products with healthiness is acknowledged to be linked to the sensory perception of these products, thereby potentially impairing their inferred sensory qualities and reducing their enjoyment during actual consumption (Raghunathan, Naylor, and Hoyer, 2006). Thus, the present research elaborates on how “consuming well” and sensory pleasure can become more interconnected (Huang & Wu, 2016).

3 Sensory information and the role of vivid sensory imagery

Sustainability may still be regarded as an abstract concept to many consumers (Grunert, Hieke, and Wills, 2014); moreover, healthy and environmentally friendly food behaviours are considered less convenient than conventional routines, as they require physical and mental effort to change current habits (Brunner, Van der Horst, and Siegrist, 2010). Thus, respective literature calls for “different interventions geared to break dietary habits” (Hoek, Pearson, James, Lawrence, and Friel, 2017) and emphasizes that “efforts to change habitual behaviours will have more impact if they include changes in the situational food buying and consumption context, as these are shown to be most effective” (Hoek, Pearson, James, Lawrence, and Friel, 2017; Van't Riet, Sijtsema, Dagevos, and De Bruijn, 2011).

It is acknowledged, that sensory properties play a vital role with regards to product selection; however, they represent intrinsic attributes and as such they may not be assessed prior to purchase. Consequently, consumers lack reliable information about the sensory product experience during the stage of purchase, wherefore extrinsic cues guide product selection (Hoppert et al., 2014). The effects of externally provided information on perception have been widely underresearched (Krishna, 2012).

In literature, however, it remains unclear whether and how the provision of sensory information and the evocation of sensory imagery may assist in reducing consumption barriers for conscious products. While some studies point to the risk of communicating sensory information by stating that “even if it fails at changing the expected benefits of consumption, marketing communication can influence the importance of these benefits, for example, by making taste a more important goal than health” (Chandon & Wansink, 2012), other publications highlight that “focusing on sensory pleasure can make people happier and willing to spend more for less food, a triple win for public health, consumers and businesses alike” (Cornil & Chandon, 2016).

Building on the availability-valence hypothesis, the vividness of sensory information should be crucial in affecting attitudinal judgments, as the vividness of information presented in a message influences the extent to which people will engage in cognitive elaboration (Kisielius & Sternthal, 1986). Moreover, “evoking a vivid image produces a life-like activity of 'seeing', 'hearing', 'tasting', 'smelling', 'touching' or feeling something; mental imagery is a [...] process that resembles, but is not identical to, perception with action” (Marks, 2019). Indeed, extant research indicates that vivid imagery can serve as a key element in current food induction and, as such, determine the intensity of food cravings (Tiggemann & Kemps, 2006).

Resting upon these considerations and the few contradictory findings, we draw on literature on imagery and the availability-valence hypothesis and suggest that sensory information, particularly if presented in ways encouraging vivid imagery, will assist in the reduction of consumption barriers for conscious (climate-friendly, organic and regional) food products. Thus, we put forward the following hypotheses:

H1: Stimulating sensory imagery may affect consumers' pre- and post-consumption responses as well as behavioral intentions towards conscious (climate-friendly, organic, regional) food products.

H2: Higher *vividness* of the evoked sensory imagery will result in more favorable consumer responses, while decreases in vividness will reduce this positive effect.

Despite of the importance of imagery, literature provides reason to assume that it might be advantageous to employ unspecific rather than very specific stimuli in order to evoke imagery. One theory supporting this assumption is *Grice's Theory of Conversational Implicature* (Grice, 1975), basically suggesting that that if marketing messages are not sufficiently informative, consumers tend to make additional, positive attributions about the product in question and, resultantly, evaluate this product more favorable, whereas if messages are considered sufficiently informative, no reasons to form additional, positive attributions would exist (Miller & Kahn, 2005). Consequently, measures leaving space for individual attributions (e.g., "storytelling", that is, a verbal description of a situation or context) might have a more favorable impact than measures triggering rather concrete images (e.g., a visual depiction of a situation or context). Storytelling would represent such a measure, as it encourages individual imagery and evokes the stimulation and use of the senses (Heyn, 2003). Building thereupon, we propose that,

H3: Measures encouraging *individual* imagery by providing *unspecific* stimuli (storytelling, i.e., verbal description of a situation or context) will result in more favorable consumer responses than measures guiding imagery to a higher extent by providing *concrete* stimuli (visual depiction of a situation or context).

4 Empirical work

4.1 Study design

To test our hypotheses, we conduct an experimental study ($n = 160$) in the sensory lab of a Central European University. The experiment is conceptualized as a mixed design study, whereby the *degree of stimulated sensory imagery* (control group without stimulation vs. verbally presented sensory information vs. individual sensory images generated by storytelling vs. vivid sensory images created by VR technology) serves as between-subjects factor and the *type of conscious product* (climate-friendly vs. organic vs. regional) as within-subjects factor. Consumer responses before (sensory expectations, expected liking, expected health impact, pre-consumption behavioral intentions) and after tasting (sensory perception, perceived liking, post-consumption behavioral intentions) serve as dependent measures.

Verbally presented sensory information communicates the crispy texture and fruity apple flavor of the stimuli.

As visual images tend to be experienced as most vivid compared to other sensory modalities (Schifferstein, 2008), vividness of sensory imagery is manipulated using VR technology: One HTC Vive Pro Eye devices are employed to communicate sensory information in the “vivid sensory imagery” condition. The Plymouth Sensory Imagery Questionnaire (Andrade, May, Deepröse, Baugh, and Ganis, 2013) is used to assess the subjective degree of vividness of mental imagery.

Individual sensory images are created by storytelling, i.e., verbally describing a situation in a natural environment that is based on the same image that is also used for the group using VR technology.

Unstructured line scales with extreme-point-descriptions were used to collect data (0-10).

4.2 Selection of product category and stimuli

As unprocessed food products are subject to various interactions with the environment during their growth, harvest, and storage, wherefore their properties and quality characteristics change over time (Tscheuschner, 1996), thus impairing their experimental comparability, we decide on a processed food product, namely corn sticks with apple flavor of the brand “Rosenfellner Mühle”. The choice of this concrete product bases upon several considerations: Corn sticks may easily be portioned and served for sensory testing, do neither represent an extreme example for sensory pleasure nor healthiness, and may be labeled either as a climate-friendly, organic, or regional product.

4.3 Procedure

160 voluntary and untrained students and visitors of the university took part in the four test groups mentioned in the sensory tests.

During the sensory tests, each of the 160 test subjects in the four test groups were given three times (climate-friendly vs. organic vs. regional labelling, whereby these three conditions were arranged in a random order for each respondent) three samples of the corn sticks. Additionally, the participants were provided with a glass of water to neutralize their taste. The control group was only informed in advance that they would receive three variants of a product for assessment (climate-friendly, regional and organic). EG 2 was also informed about the crispy texture and fruity apple taste of the product. EG 3 was provided with a 360° picture via VR technology for 30 seconds before the tasting, which showed the environment

of close to nature agriculture. The same picture was described to EG 4 in the form of storytelling, and the test subjects were asked to empathize with the picture for 30 seconds.

Respondents were then instructed to systematically assess the samples based on their expectations (sensory expectations, expected liking, expected health impact, pre-consumption behavioral intentions), followed by sensory tasting and a further assessment of their perception (sensory perception, perceived liking, post-consumption behavioral intentions).

The ratings given by the test persons were transferred to Microsoft Office Excel and evaluated with XLStat®.

4.4 Analysis

The study was analysed with various ANOVA's and Benjamini-Hochberg post-hoc test, whereby the *degree of stimulated sensory imagery* (control group without stimulation vs. verbally presented sensory information vs. individual sensory imagery evoked by storytelling vs. vivid sensory imagery evoked by VR technology) serves as between-subjects factor and the *type of conscious product* (climate-friendly vs. organic vs. regional) as within-subjects factor.

4.5 Results

Our results indicate that stimulating sensory imagery can affect consumers' pre- and post-consumption responses as well as behavioral intentions towards conscious (climate-friendly, organic, regional) food products and therewith support in the reduction of consumption barriers for suchlike products. However, it is the encouragement of *individual* imagery rather than the evocation of particularly *vivid* imagery through VR technology or the evocation of *concrete* sensory imagery through the provision of sensory descriptions which is decisive for the success of these measures.

The encouragement of individual imagery by storytelling (i.e., verbally describing a context which could be experienced with multiple senses) has the strongest positive effect on product expectations, as it significantly enhances sensory expectations for, both, the product with organic ($F(3,158) = 2.708, p = .047$, Benjamini-Hochberg $p = .015$) and regional label ($F(3,158) = 3.163, p = .026$, Benjamini-Hochberg $p = .002$), as compared to the evocation of vivid imagery through the virtual experience of the same context via VR technology.

Partly, this effect persists even after tasting, as reflected, for instance, by significant positive effects of storytelling on texture perceptions for organic products ($F(3,158) = 3.121, p = .028$; Benjamini-Hochberg $p = .018$).

Figures 1-3 exemplarily illustrate the results of some characteristics that revealed significant differences between the storytelling and VR group for the stimulus with "organic" label.

Interestingly, and as can be seen from the figures, both, the provision of sensory descriptions and the VR condition even resulted in a slight deterioration of consumer responses, whereas the encouragement of individual imagery through storytelling had a consistent positive impact on our success variables.

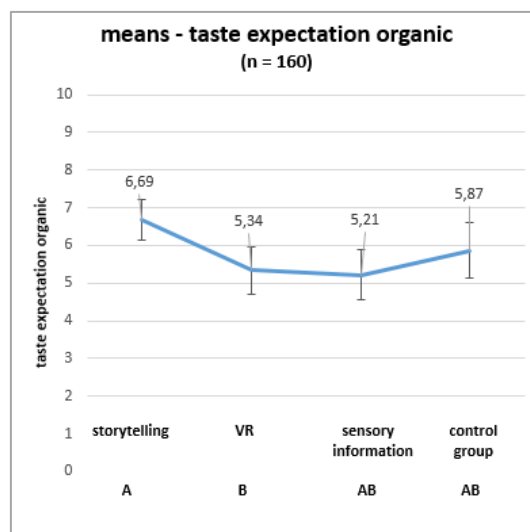


Figure 1: means – taste expectation organic

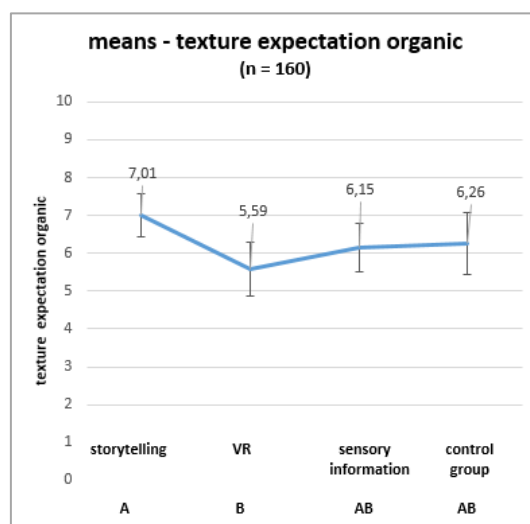


Figure 2: means – texture expectation organic

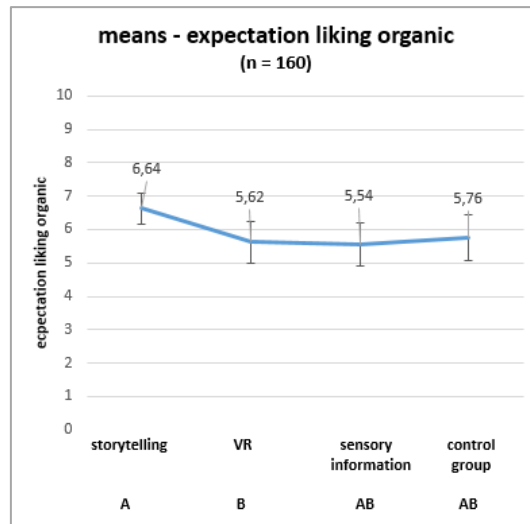


Figure 3: means – expectation liking organic

5 Conclusio

The present research, located at the interface between marketing, sensory science and VR, aims to contribute to this young research field by investigating how messages evoking vivid sensory imagery can assist in the reduction of consumption barriers for conscious (climate-friendly, organic and regional) food products.

Our results indicate that is the encouragement of *individual* imagery rather than the evocation of particularly *vivid* imagery, can be effective in enhancing sensory expectations and, therewith, reducing consumption barriers for conscious products.

Despite of the pioneer character of our study, we consider this a highly interesting finding in times where many efforts are put into the creation of ideally lifelike, virtual simulations of the real world. Though acknowledging the potential of these simulations in manifold areas, our research suggests that encouraging individual imagery by providing rather unspecific stimuli (storytelling, i.e., verbal description of a situation or context) may significantly reduce consumption barriers for conscious products, while guiding imagery to a higher extent by providing concrete stimuli (virtual depiction of a situation or context) may even have reverse effects.

6 General discussions, implications and further research

Future research should focus on gaining a deeper understanding of the role of imagery in reducing consumption barriers for conscious products. Above all, it would be highly interesting to investigate the effectiveness of different ways of encouraging imagery. Considering the pioneer character of the presented empirical work, further research efforts

should be put into the comprehension of the effects of measures varying with regard to the concreteness of the evoked imagery, in order to identify advantages and disadvantages of rather individual (unspecific stimuli) vs. rather “guided” (concrete stimuli) imagery.

Finally, the relevance of imagery is likely not limited to conscious products but should be explored also for other product categories with inherent consumption barriers (such as novel foods).

7 References

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