Two sides of the coin: Verbal sensory information and its impact on consumer responses – a meta-analysis covering positive as well as backfiring effects of verbal sensory information

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Abstract:

Sensory properties of products, such as taste, respectively flavor, texture or smell, are of high relevance during the purchase and consumption of products. However, precisely these attributes can, as intrinsic properties, not be assessed by the consumer prior to purchase. Thus, consumers tend to rely on extrinsic cues in making their decisions. We propose that information regarding sensory properties of products may be coded in language and communicated as cognition; then representing an extrinsic cue. In the present paper, we focus on verbal sensory information. While several authors report positive effects of verbal sensory information, other studies reveal surprising results, providing evidence of unintended or even backfiring effects of verbal sensory information. Despite of the paramount importance of these contradictory findings, this topic is so far not approached systematically in literature. Against this background, we present a meta-analysis of extant empirical work and discuss implications for further research.

Keywords: Sensory marketing, verbal sensory information, amodal sensory information

Track: Marketing Strategy & Theory

1. Introduction of the paper

Fueled by the recent bridge building between consumer and sensory science and the evolvement of the young research field of sensory marketing, there is an ongoing discussion about how the human senses affect cognition and, vice versa, how cognition may shape sensory perception. While a considerable amount of literature focuses on the effects of senses on cognition, "…little research attention has been devoted to the effect of information on sensory perception. There is much scope for additional research exploring the effect of information on sensory perception" (Krishna & Schwarz, 2014, p. 162). Indeed, sensory perception may be affected by information, and therewith shaped through cognition (Elder, 2011; Elder & Krishna, 2010); however, the effects of externally provided information on perception have been widely underresearched (Krishna, 2012).

As the term 'externally provided information' spreads out to all kinds of extrinsic cues, we will use the more precise term *sensory information* to distinctly refer to information providing insights about the sensory properties of products. 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 (i.e., cues that are not part of the product itself) guide product selection (Hoppert et al., 2014). Information regarding sensory product properties may, though, be "…coded in language and communicated as a cognition" (Mittal, 2004, p. 446), then representing an extrinsic cue. We refer to sensory information provided as extrinsic cue as *amodal sensory information*. While amodal sensory information may be provided in different ways (e.g. graphical or verbal), we will focus exclusively on verbal information in the subsequent meta-analysis. For the sake of legibility and simplification, verbal amodal sensory information will be referred to as *verbal sensory information*, as verbal information communicating sensory properties of a product is amodal by nature.

2. Meta-analysis of literature

2.1 Taxonomy of search

Besides relevant marketing journals, we include several thematically fitting non-marketing-related journals in the analysis at hand. The total selection of included journals consists of 13 marketing journals (Journal of Marketing, Journal of Advertising, Journal of

Advertising Research, Journal of Consumer Behavior, Journal of Consumer Marketing, Journal of Consumer Psychology, Journal of Consumer Research, Journal of Marketing Research, Psychology & Marketing, Marketing Science, The Journal of Product and Brand Management, Journal of Marketing Theory & Practice) and 10 non-marketing journals (Appetite, Brain and Cognition, Chemical Senses, Chemosensory Perception, Flavour and Fragrance Journal, Food Quality and Preference, Food Research International, Journal of Food Products Marketing, Journal of Sensory Studies, The Journal of Psychology).

Bearing in mind the interdisciplinarity of the research field and, related thereto, the lack of a consistent terminology, we employ a full text search and use a broad variety of partly synonymous keywords such as 'amodal information' (Krishna, 2012), 'cognitive information' (Mittal, 2004), 'linguistic information' (Mittal, 2004; Piqueras-Fiszman & Spence, 2015), 'sensory claim' (Kähkönen, Tuorila, & Lawless, 1997), 'sensory cue' (Compeau, Grewal, & Monroe, 1998; Ng, Chaya, & Hort, 2013), 'sensory descriptive' (Wansink, van Ittersum, & Painter, 2005), 'sensory description label' (Swahn, 2012), 'sensory label' (Imm, Lee, & Lee, 2012), 'taste label', respectively 'flavor label' (Velasco et al., 2015), 'verbal cue' (Bensafi, Rinck, Schaal, & Rouby, 2007; Hoegg & Alba, 2007; Rebollar et al., 2017), 'verbal information' (Kim & Lennon, 2008; Krishna, 2012), and 'verbal label' (Herz & von Clef, 2001) in combination with sensory modalities and respective synonyms (e.g. 'smell', 'scent', 'odor', 'odour' and 'aroma' are used synonymously to search for olfaction; 'taste' and 'flavor', respectively 'flavour' to search for gustatory information). Moreover, we apply several broader query terms (a detailed listing of keywords can be requested from the authors).

In order to filter out irrelevant findings, we apply several exclusion criteria; consequently, literature not related to humans and the human perception, purely disease-centered literature, literature exclusively focusing on perceptual disorders or eating disorders, purely medically-, chemically-, or biologically-oriented literature, literature solely discussing policy-related or legal implications of the topic at hand, as well as literature focusing exclusively on target groups with special needs (e.g. toddlers) is excluded from the meta-analysis. *Figure 1* visualizes the stepwise procedure of analysis.

Starting with an initial review of 25,516 results, 792 papers are – after the application of the aforementioned exclusion criteria – subject to a further analysis, finally revealing 60 eligible publications focusing on topics related to verbal sensory information.

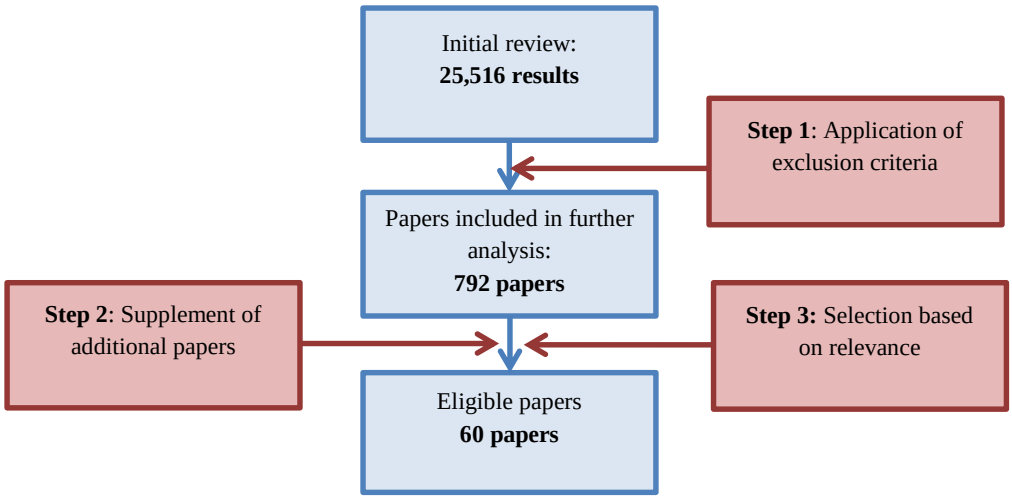

Figure 1: Stepwise procedure of meta-analysis

2.2 Categories of verbal, sensory-related information

An in-depth analysis of the stimuli employed in the remaining 60 papers reveals several distinct categories of information. Factually, the stimuli of 20 publications represent non-sensory information (e.g. descriptive names or descriptions of ingredients) and will, hence, not be subject to any further discussion. Information will be considered as *sensory-related information* if at least one of the reported stimuli includes information regarding at least one sensory attribute of the product in question.

Publications employing stimuli that address sensory modalities, but, de facto, focus on hedonic pleasures of consumption, are subsumed under the category *sensory-related hedonic information*. Descriptions such as "…tastes great" (Pelchat & Pliner, 1995, p. 158) or "tasty pleasure" (Bialkova, Sasse, & Fenko, 2016, p. 41) represent examples for this category, as the respective information addresses taste as a sensory modality, however, in point of fact communicates a hedonic ('great') rather than a sensory (e.g. sweet) attribute for this modality.

Food names communicating sensory properties of dishes are referred to as *sensory descriptive names*. The description of a dish as "succulent seabass filet" instead of just "seabass filet" represents one example of a sensory descriptive name (Krishna, 2012, p. 334).

Finally, the category *verbal sensory information* embraces all other scopes of application than food names, most notably, the communication of sensory attributes on product packages or in product descriptions; but also in advertisements. The evolving categories are visualized in *table 1*.

Category of sensory-related information	Number of publications	Authors
sensory-related hedonic information	7	Bialkova et al. (2016), Fenko et al. (2015), Jacquot et al. (2013), Kähkönen et al. (1997), Lumeng & Cardinal (2007), Moore & Lee (2012), Pelchat & Pliner (1995)
sensory descriptive names	10	Amsteus et al. (2016), Chung et al. (2012), Hartwell & Edwards (2009), McCall & Lynn (2008), Mielby & Frøst (2010), Morris (2018), Turnwald et al. (2017), Wansink et al. (2001), Wansink et al. (2005), Yeomans et al. (2008)
verbal sensory information	23	Allison et al. (2004), Cavallo & Piqueras-Fiszman (2017), Choe & Hong (2018), Crum et al. (2011), Danner et al. (2017), d'Astous & Kamau (2010), Elder & Krishna (2010), Gámbaro et al. (2017), Grabenhorst et al. (2013), Heide & Olsen (2017), Imm et al. (2012), Kähkönen et al. (1999), Li et al. (2019), Litt & Shiv (2012), Mahanna et al. (2009), Mueller et al. (2010), O'Mahony & Thompson (1977), Sáenz-Navjas et al. (2013), Seppä et al. (2015), Smith et al. (2013), Steiner & Wagner (2016), Swahn et al. (2012), Tuorila et al. (1998)

Table 1: Categories of sensory-related information

2.3 Effects of verbal sensory information

Regarding the *effects* of verbal sensory information on consumer responses, the meta-analysis reveals contradictory findings (see *table 2*) across the reviewed studies. Unanimously positive effects of sensory-related information on the respective outcome variables are reported by one (out of seven) studies examining sensory-related hedonic information, five (out of 10) studies focusing on sensory descriptive names and nine (out of 23) studies on verbal sensory information.

category of information	positive effects only	partly positive, partly no effects	no / small effects	partly positive, partly backfiring	partly no effects, partly backfiring	backfiring effects only
sensory-related hedonic information	1	4	1	1	-	-
sensory descriptive names	5	2	1	1	1	-
verbal sensory information	9	4	3	1	1	1

Table 2: Overview of the effects of sensory-related information

Across all three categories, five studies find either no or infinitesimally small effects. The results of further four studies on verbal sensory information cannot be categorized with respect to their outcomes, as verbal sensory information is not analyzed separately. However, a special emphasis should be placed to the last three columns of *table 2*: Altogether, six publications report backfiring effects (i.e., negative effects of verbal sensory information) in at least some instances; thereof one study focusing on sensory-related hedonic information, two studies on sensory descriptive names and three studies on verbal sensory information. Although the respective findings leave no doubt about the fact that sensory information might have unintended effects, it remains inconclusive why suchlike backfiring effects occur.

3. General discussion and implications for further research

3.1 Scientific investigation of sensory information

Though the total number of studies investigating verbal sensory information, sensory descriptive food names or sensory-related hedonic information might create the semblance that the topic has received quite some scientific attention, the present meta-analysis basically reveals the opposite, indicating that only very few studies de facto approach the topic systematically. The lack of studies effectively *focusing* on verbal sensory information is reflected by the fact that sensory information is oftentimes examined only parenthetical, besides or even integrated within a plentifulness of other information types. This entails two major problems. On the one hand, the effects of sensory information are frequently compared to completely different information types, making it difficult to draw conclusions with regards to the general effectiveness of sensory information. On the other hand, due to the fact that sensory information is frequently combined with other types of information within the same stimuli, it can prove difficult to allocate effects to either the sensory or other informational elements of these stimuli.

3.2 Backfiring effects of sensory information

We attribute paramount importance particularly to the irregular findings reported in the extant studies. Against the background of repeated reports of a backfiring of sensory information, we consider further research regarding different explanatory approaches as vital for a profound understanding of verbal sensory information.

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