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How language and image construct synaesthetic metaphors in print advertising

Marianna Bolognesi, Francesca Strik Lievers

University of Oxford, University of Genoa

Abstract

Research in (multi-)sensory marketing suggests that engaging consumers' senses is an efficient way to create effective advertisements. In this study we explore how sensory cues are used in print advertising. In particular, we identify and describe print advertisements featuring instances of synaesthesia, that is, a metaphor by which properties of a given sensory modality are attributed to a concept that relates primarily to a different sensory modality. We propose that these advertisements can be classified based on the role played by the image and the text, as well as based on the way visual and linguistic elements interact. We also outline how our contribution can set theoretical groundwork for the design of new empirical research questions in cognitive science and marketing studies.

Keywords

synaesthesia; visual metaphor; print advertising; sensory marketing

1. Introduction

Within the wide and interdisciplinary research area called ‘visual communication’, during the past decades metaphors have gained increasing attention, especially in the fields of cognitive linguistics, communication, and media studies. Drawing from previous research on visual rhetoric (e.g., Barthes, 1977[1964]; Kennedy, 1982; Whittock, 1990), in the past 20 years authors from different scholarly traditions have proposed models to describe how metaphorical messages are conveyed by visual means (e.g., Forceville, 1996; 2009; 2012; El Refaie, 2003; Phillips and McQuarrie, 2004; Šorm and Steen, 2013; Bolognesi, forth.). Despite the increasingly large body of literature on visual metaphors, research on specific types of metaphors and other figures of speech within the visual mode is still limited (with the exception of metonymy, for which recent studies are available, see Pérez-Sobrino, 2016, 2017; Feng, 2017).

Our aim is to investigate how words and images construct *synaesthetic metaphors* in print advertising. Synaesthetic metaphors, typically studied within the domain of language, connect concepts that refer to different sensory modalities (see Section 2). For instance, in *sweet voice*, a hearing-related concept is described through a taste-related adjective. In the present study we describe and try to understand the complex interaction between visual and linguistic elements in the expression of synaesthetic messages within the prolific and widely investigated genre of print advertising. The reasons for choosing this specific genre are twofold. First, advertising often appeals to the senses (Section 3). Second, as already observed by Barthes (1977[1964]: 33), print advertisements are relatively easier to analyze, compared for instance to artistic paintings, because they are by definition intentional and try to state their message as clearly as possible, in order to sell a product.

We analyze several examples of print advertisements featuring synaesthetic metaphors, which we selected through a specific methodology (described in Section 4). We suggest that such examples can be organized according to a three-pronged typology, based on the different degrees and kinds of interaction between text and image (Section 5). The discussion of the results of our analysis allows us to highlight possible implications for studies in the fields of cognitive sciences and marketing (Section 6).

2. Synaesthesia

Synaesthesia has recently received much attention, both as a neuropsychological phenomenon and as a figure of speech. The term *synaesthesia* was originally used in the nineteenth century in the medical field as a label for a rather rare neuropsychological condition, by which in some individuals the stimulation of one sensory modality provokes (automatically and involuntarily) the response also of another sensory modality (more recent studies usually provide wider definitions, also involving cognitive and emotional factors, see Macpherson, 2007; Simner, 2012; Simner and Hubbard, eds, 2013). In a synaesthetic subject, for instance, hearing a musical note may induce the

simultaneous vision of a color: F might be accompanied by the vision of yellow, A# by the vision of red, and so on. According to many diagnostic tests and neuroimaging experiments, synaesthetes simultaneously experience real perceptions in both involved modalities (for a critical review of such studies and an alternative proposal, cf. Hupé and Dojat, 2015). In the case of the vision of colors evoked by hearing musical notes, for example, in the brain of the synaesthetic subject, both the hearing and the visual areas of the brain areas would be simultaneously activated. It is a chiefly perceptual phenomenon.

Soon after its coinage in medicine, the term synaesthesia was adopted by scholars of literature and linguistics. In these fields, like in medicine, the term synaesthesia signals the involvement of multiple sensory modalities; however, sensory associations are here linguistic and conceptual, rather than perceptual¹. Linguistic synaesthesia can be defined as a type of metaphor associating sensory concepts that pertain to different sensory modalities (Strik Lievers, 2017). Linguistic synaesthesia is found both in common expressions like *sweet voice* (taste and hearing), *cool color* (touch/temperature and sight), and in more creative ones like *golden melody* (Keats, *Hyperion*; sight and hearing). This is the use of the term *synaesthesia* that is relevant for our research. In other words, we explore combinations of sensory concepts; in print advertising, such combinations are obtained not only through linguistic means, but also through visual ones.

In linguistics, many studies have shown that in synaesthetic metaphors certain sensory modalities are more likely than others to be combined together. Additionally, certain sensory modalities are more likely to be sources and others are more likely to be targets of synaesthetic transfers (Ullmann, 1957; Dombi, 1974; Tsur, 2007; Shen and Gil, 2008; Caballero and Paradis, eds, 2015). Sources typically are concepts of touch, smell, or taste (i.e., the so-called ‘lower senses’), while targets tend to be concepts of hearing or sight (i.e., the so-called ‘higher senses’); this is the case, for instance, in *sweet voice*, where taste (*sweet*) is the source and hearing (*voice*) is the target of the synaesthetic transfer. Other types of combination are not impossible (they can relatively often be found in poetic texts), but synaesthetic transfers having one of the ‘lower senses’ as a source and one of the ‘higher senses’ as a target are decidedly more frequent², as confirmed by the analysis of data from many languages (among others, Yu, 2003; Shen and Gil, 2008; Strik Lievers, 2015; Zhao, Huang and Long, forth.). In Section 6 we will discuss whether considerations about preferences in sensory combinations may also apply to synaesthesia in visuals.

3. Visual metaphors and the senses in advertising

3.1 Visual metaphors

Visual metaphors are highly structured images in which the viewer is pushed to construct metaphorical transfers from a source to a target domain, cued by the image itself. In advertising, such images are typically used to help sell products or services by representing them through properties and features of other entities, used as source domains (see for example Forceville, 1996). The usage of rhetorical features in print advertisements, and in particular of visual metaphors, is illustrated by Phillips and

McQuarrie (2002) in a retrospective study based on US magazine advertisements from 1954 to 1999. The increasingly popular use of visual metaphors in print advertising prompted a wave of interest in various academic fields. In the past decade, scholars working on figurative language in multimodal communication (e.g. Forceville and Urios-Aparisi, 2009; Hidalgo Downing and Kraljevic, 2011; Pérez-Sobrino, 2016) have addressed the advantages of using metaphor in advertising. In the field of marketing, scholars have shown that metaphorical advertisements are more effective, i.e. more easily recognized and recalled, and trigger more positive responses and interpretations than non-metaphorical ones, especially within the visual mode (McQuarrie and Mick, 2003; McQuarrie and Phillips, 2005; Kitchen, 2008; Tynan, McKechnie and Chhuon, 2006; for neuroimaging evidence of the major emotional engagement triggered by metaphorical texts, compared to non-metaphorical ones, see Citron and Goldberg, 2014; Citron et al., 2016). Other aspects that have been addressed by recent research on visual metaphors in print advertising relate to the cross-cultural variation in the understanding of these images, and the degree of complexity involved in the construction of the visual metaphor (e.g. Van Mulken, le Pair, and Forceville, 2010; van Hooft et al., 2013; Pérez-Sobrino and Littlemore, forth.).

The typical structure of visual metaphors in advertising sees the product as the target of the metaphor. For example, in an advertisement for an off-road vehicle, a car engine depicted as a rhino, triggers properties such as the power, strength, and robustness, which originally belong to the animal. Such properties are then mapped onto the car engine, and eventually to the car brand.

Both, visual and linguistic elements, are used within the genre of print advertising, to construct a metaphorical message (e.g. Forceville 2008a). The terminology used to differentiate the different types of interactions are often problematic, but in principle it should be possible to suggest a theoretical distinction between: i) visual (monomodal) metaphors, as images where both source and target domains are conveyed by visual means (almost undocumented in advertising); ii) verbo-pictorial metaphors, as print advertisements and billboards in which typically the visually conveyed target is the product to be sold, and the source is conveyed (also) through linguistic cues; iii) (other types of) multimodal metaphors, which make use of other modalities, such as audio (this category typically applies to commercials in moving images, rather than print advertisements and billboards). Linguistic anchors are typically used in advertising to express concepts that are not easily and unambiguously conveyed by visual means; because advertisements have to be as unambiguous as possible, linguistic anchors help constraining the multiple available interpretations of a message. For the sake of simplicity, in what follows we will refer to both, monomodal visual metaphors and verbo-pictorial metaphors as *visual metaphors*. Moreover, we will use the label *synaesthetic metaphors* to refer to synaesthetic metaphors conveyed not only by language, but also by visual means.

3.2 Sensory and multisensory marketing

Starting from the 1970s, marketing research and theory has seen the emergence of a new field: sensory marketing (see Krishna, 2013 for a review). While classic marketing mainly addressed the rationality of consumers, sensory marketing also aims to engage their feelings and emotions, thus increasing the memorability of the branded product (Lindstrom, 2005; Krishna, 2012; Lund, 2015, Krishna and Schwarz, 2014). According to the literature review in Peck and Childers (2008), in the past few years the amount of sensory studies in consumer behavior has dramatically increased. Among the aspects tackled in these studies, the authors address how sensory branding triggers emotional involvement of consumers by appealing to their senses. For instance, it is now common to find perfumes advertised in magazines on samples provided directly on a cardboard placed inside the magazine, or to find slow background music in supermarkets, which has been shown to increase sales.

A more recent development of sensory marketing is multisensory marketing: if appealing to one sense has positive marketing effects, appealing to multiple senses and combining them produces even stronger and better consumer response (Hultén, 2011; Schifferstein and Desmet, 2008; von Wallpach and Kreuzer, 2013; Knoeferle et al., 2016). For instance, Spangenberg et al. (2005) showed how at Christmas time the combination of ambient Christmas music and Christmas-related scent in shops influences consumers' behavior (see also Spence et al., 2014 for a review of research in multisensory store atmospherics). Another example is that of audio-logos (see for instance Forceville, 2008b), through which a tune or song are used to evoke a brand (e.g., the Nokia tune), and arguably provide a positive 'familiarity effect' on the consumer.

The 'multisensory revolution in contemporary marketing', as it has been defined by Howes (2007), is considered today one of the ultimate frontiers of marketing, which enables brands to trigger superior experiences in the consumers, by touching upon more than one sense simultaneously, and tapping in their emotions. It has been suggested that the large amount of commercial messages to which consumers are exposed on a daily basis, and the limited time exposure to such stimuli, cause the commercial messages to easily fade from memory. Multisensory branding, by tapping into multiple sensory responses, allows brands to cue associations between sensory stimuli and advertised products or whole brands. Such associations are immediate and subconscious, and can bypass the (time and energy) requirements of a traditional explicit advertising message (Binet et al., 2015).

The recent body of scientific research in multisensory branding makes the analysis of synaesthesia in advertisements an extremely relevant topic. Some studies on the use of *linguistic* synaesthetic metaphors in advertisement are available in the marketing (Nelson and Hitchon, 1995, 1999; Akpınar and Berger, 2015) and linguistics literature (Holz, 2007). However, to the best of our knowledge the *visual* expression of synaesthetic sensory association has not been explored yet. As stated above, this is precisely the topic of our research: the use and combination of concepts from different sensory modalities, as conveyed by visual (and linguistic) means in print advertising (still images).

4. Synaesthetic metaphors in print advertising

To find data for our study, we used popular open-source comprehensive repositories of advertisements (AdsOfTheWorld and Coloribus) as well as the Web (Google Image Search)³. In a first exploratory investigation we browsed hundreds of images through the categories provided by the platforms. We selected the categories that brand products for which the most salient properties are their sensory qualities (e.g., “food”, “music”, “confectionery, snacks”). Additionally we searched the databases through keywords pointing to the individual senses (e.g., “hearing”, “sight”, “smooth”). We also searched for additional advertisements in the Web (accessed through Google Image Search). Our queries featured the words “advertising” or “advertisement”, together with the keywords and category labels used in the repositories described above. Among all the advertisements that we browsed, we then had to identify those actually featuring visual metaphors that involve different sensory modalities, and which are therefore likely to be instances of synaesthesia. This is not an easy task, because it has to be accomplished manually, by carefully examining each advertisement. While we did not aim to compile a corpus of instances, we still needed a strategy to recognize good examples to be analyzed and discussed.

Our method for the identification of relevant instances of synaesthesia in print advertising is the following:

1. Identify the advertised products within the image.
2. Select the advertisements for products that clearly relate to a sensory modality x (e.g., advertisement for chocolate; related sensory modality: taste), by taking into account all the visual and the linguistic information encoded in the advertisement.
3. Search for linguistically and/or visually conveyed properties that used to advertise the product, and that point to a sensory modality y (e.g., slogan used for chocolate advertisement: ‘music to your mouth’; sensory modality: hearing). If such properties are found, the advertisement is a good candidate to be classified as synaesthetic metaphor.

Given this identification method, the examples in Figure 1, Figure 2, and Figure 3, which nonetheless encompass sensory visual metaphors, were *not* classified as instances of synaesthesia in print advertising, for different reasons hereby illustrated. We describe here these negative cases, which help further clarify, by contrast, what we consider to be good instances of synaesthesia (which are analyzed in Section 5).



Figure 1. Advertisement for potato chips. Copyright owner: Grey Toronto advertising agency (2008). Retrieved from: <https://www.coloribus.com/adsarchive/prints/pringles-tongue-11484605/>

In Figure 1, the product to be sold is a potato chip, which in its representation resembles a tongue. We can deduce this analogy from the shape of the potato chip and its position within the container, which in turn resembles an open mouth. In this case, both 'chip' and 'tongue' point to the same sensory modality, that of taste. Thus, according to our identification strategy, we cannot classify this advertisement as an example of synaesthesia, because in synaesthesia the product and the properties used to advertise it must point to different sensory modalities, while here only one sensory modality is evoked.

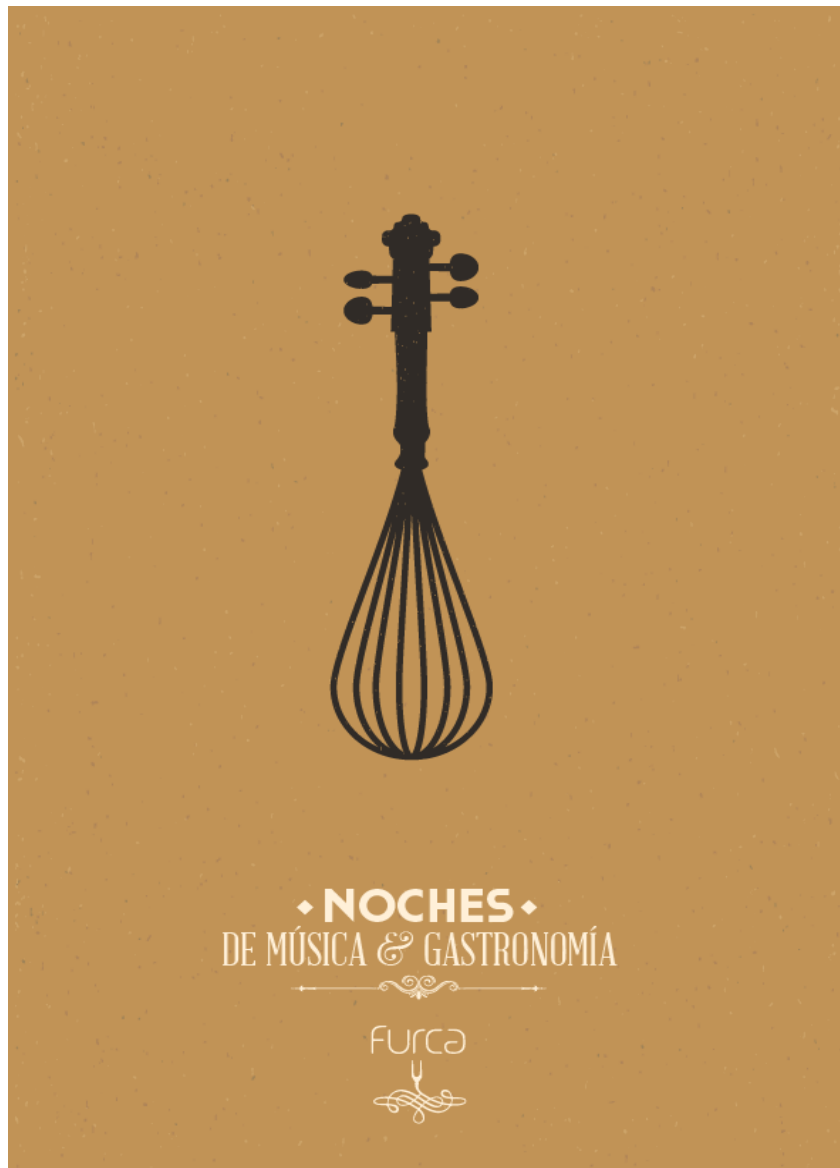


Figure 2. Advertisement for a musical and gastronomic event. Copyright owners: Gitanos consulting and Daniel Montiel (2016). Retrieved from: <https://www.behance.net/gallery/29592019/Furca-Music-and-Gastronomy-print-ads>

Figure 2 advertises an event that combines food and music. The image displays a hybrid item in which a whisk and a violin are fused together. Within this advertisement, these elements metonymically cue respectively to the taste and hearing sensory modalities (metonymic mechanisms are often used in images to convey concepts that cannot be directly represented visually; see, among others, Forceville, 2009; Bolognesi, 2017; Littlemore and Pérez-Sobrino, 2017). In this perspective, the advertisement may be classified as an instance of multisensory branding. However, it is not an instance of

synaesthesia because, although two different sensory modalities are evoked, there is no cross-mapping between them: both food (taste) and music (hearing) are advertised simultaneously.



Figure 3. Advertisement for a portable stereo. Copyright owners: Marcel creative agency, Paris, France (2011). Retrieved from: https://www.adsoftheworld.com/media/print/lasonic_big_fat_sound_piano

Figure 3 advertises a modern-looking portable stereo. In the image the viewer sees a piano made of bacon. Because the most salient properties of bacon are arguably related to its taste, and the most salient properties of a piano relate to its sound, the viewer might think that this image is indeed an instance of synaesthesia, in which the two sensory domains of hearing and taste are involved. However, the slogan suggests that the product, despite its portable size, is powerful enough to be able to deliver a ‘big fat sound’, which arguably indicates the ability of this device to reproduce sounds in high volume and with deep, bass frequencies. The modifiers *big* and *fat*, in this slogan, do not point to the sensory modality of taste. Once the viewer understands that the bacon is not meant to cue to the sensory domain of taste, but rather to the fact that bacon contains a lot of fat, and can make someone ‘fat’, then the potential synaesthesia is disentangled. The

advertisement shows a visual metaphor (showing that the piano is a piece of bacon, and therefore emits a fat sound). However, it is not an instance of synaesthesia, because, as in Figure 1, only one sensory modality is evoked (in this case, hearing, which characterizes the advertised product).

5. Analysis

The print advertisements that we collected on the basis of the procedure described in Section 4 fall into three main classes: i) Linguistically-conveyed synaesthesia, ii) Visually and linguistically conveyed synaesthesia, and iii) Visually-conveyed synaesthesia. Each of these classes is presented and illustrated by relevant examples in this section.

Before discussing the images, however, it is worth reminding the reader that the interpretations that we provide in the next sections do not – at least, not always – constitute the unique possible interpretations of such advertisements. As a matter of fact, as it has been also noticed for visual and multimodal metaphors. For example, different verbalizations and interpretations are often plausible (Forceville, 2006; Poppi et al., under review). The variability in how metaphors are verbalized into A-IS-B statements depends, arguably, on different variables, including the viewers' linguistic and cultural background, their personal experiences, as well as their personal preferences for specific words, which are then used to convey the visual metaphor in linguistic terms. The different verbalizations can differ from one another minimally (for example, when two analysts express the same metaphor term using two synonymic expressions), but can also differ substantially, and lead two analysts to provide different interpretations, based on the same image. While this is particularly relevant for visual metaphors within the genre of artistic paintings (Poppi et al., under review), it can be also applicable to the identification and formalization of visual metaphors in print advertising. We therefore decided to analyze the images selected for this study in a discursive way, in order to include as much detail as possible, avoiding the 'rigid' formalization of 'A-IS-B' statements.

5.1 Linguistic synaesthesia

The advertisements included in this class can be defined as synaesthetic because they feature a linguistic synaesthesia; the image, we argue, does not participate in the construction of this synaesthesia.

Figure 4 advertises a brand of potato chips. The image displays a bag of chips, and the slogan says: *Like sweet banjo music to your tongue*. In this case, we have a linguistic synaesthesia, *sweet music*, embedded in a simile signaled by *like*. The target sensory modality of the synaesthesia *sweet music* is hearing (*music*), while the source is taste (*sweet*). The simile *Like sweet banjo music to your tongue*, however, reverses this directionality by suggesting that taste (*tongue*) has to be compared to hearing (*music*). Only by correctly interpreting the simile, the consumer can understand the message of the advertisement, which aims to sell chips. The interpretation is achieved once the positive

qualities related to the product's taste are evoked through the hearing sensory domain. Moreover, the slogan *Like sweet banjo music to your tongue* is also a variation of the expression *Like music to your ears*. This intertextual reference, if detected by the viewer, can arguably contribute to the interpretative process by adding a sense of familiarity, given by the (conscious or subconscious) recognition of an existing idiomatic expression.

A second catchphrase on the left side of the bag says: *The chips with a thick Southern accent*. The imagery on the bag and the name of the chips (Hogwine) evoke a specific geographical area of the US, in which banjo music is particularly popular. However, in our opinion these elements do not actively contribute to construct the synaesthetic metaphor, which is expressed linguistically in the main slogan. They rather contribute to evoke a complex series of cultural references related to the Southern style music, which typically uses banjos. In other words, the visual setting that completes the print advertisement does not contain strictly sensory or synaesthetic components. We therefore classify this advertisement as an instance of linguistically-cued synaesthesia. That is, the advertisement, which displays a complex rhetorical structure and evokes culture-specific references, also includes an instance of synaesthetic metaphor, which is constructed through linguistic means only, whereas the visual cues somehow support and reinforce the linguistically conveyed synaesthesia. This advertisement differs substantially from Figure 1, even though they both advertise a brand of potato chips. Figure 1, the first negative example that we analyzed, displays a visual metaphor, in which the advertised product is depicted as a tongue. However, there are no synaesthetic transfers in Figure 1, while in Figure 4 there is a (linguistically conveyed) synaesthetic metaphor, which suggests that the advertised product is attributed (arguably positive) properties of banjo music.



Figure 4. Advertisement for potato chips. Copyright: Sick, Los Angeles, USA (2010). Retrieved from: https://www.adsoftheworld.com/media/print/hogwine_potato_chips_banjo_music

5.2 Visually and linguistically conveyed synaesthesia

The advertisements included in this class feature a synaesthesia that is constructed by both linguistic and visual means. Depending on the way language and image interact in the construction of the synaesthetic metaphor, two sub-classes can be identified: i) advertisements in which the synaesthesia is co-constructed by linguistic and visual elements, and ii) advertisements in which the image can be seen as the representation of a linguistic synaesthesia.

5.2.1 Co-construction

Figure 5 advertises a brand of headphones. The image displays, on a pinkish background, the advertised headphones, whose wires outline the silhouette of a female body.

We can observe here a complex interaction between the image and the linguistic anchors. The slogan says: *Making sound sexy since 2006*. The slogan contains two keywords that we hereby analyze in their interaction with the image: *sound* and *sexy*. The word *sound* is clearly related to hearing, and therefore points directly to the sensory modality that has to be considered as the target sensory domain of the synaesthesia. On the other hand, the reader may argue that *sexy* is not strictly related to a single sensory modality. However, in this case it is the image, displaying the silhouette of a woman's body, which selects the sight-related meaning of *sexy*, i.e. 'visually attractive'. The artist's choice of expressing the idea of sexiness by means of a female silhouette can be debatable, and this topic is indeed quite sensitive in these years. As analysts, we hereby focus on the intended message, which probably aims to suggest that the positive (visual) property of the silhouette is to be transferred to the hearing experience one can get with the advertised headphones. This commonly happens in linguistic synaesthesia: the properties of the source concept that are transferred to the target are often not only strictly sensory, but also convey the positive or negative evaluations typically associated with the perceptual experience of the source concept (Strik Lievers, 2015; Winter, 2016a; see fn. 1). For instance, in *sweet voice* the adjective *sweet* attributes to the noun *voice* the positive evaluation that is typically attached to sweet tastes.

To sum up, in the advertisement in Figure 4 there is a visual metaphor displaying the advertised product as if it was the silhouette of a female body. The slogan contributes to forge the synaesthetic structure, by suggesting that the actual target domain is the sound produced by the headset (and therefore the sensory domain of audition), which is defined as *sexy*, based on the visually attractive properties of the female silhouette, which belong to the sensory domain of vision. In this complex structure the viewer may appreciate a strong interaction between visual and linguistic elements. The visual representation, by selecting the sight-related sense of the word *sexy*, helps the consumer to identify the source domain of the synaesthesia. Once sight is identified as the source sensory domain, the viewer is stimulated to map the positive evaluation triggered by sight onto the target (hearing). In other words, the advertisement suggests that the headphones produce beautiful sounds, where beauty is a property that typically we experience through sight.

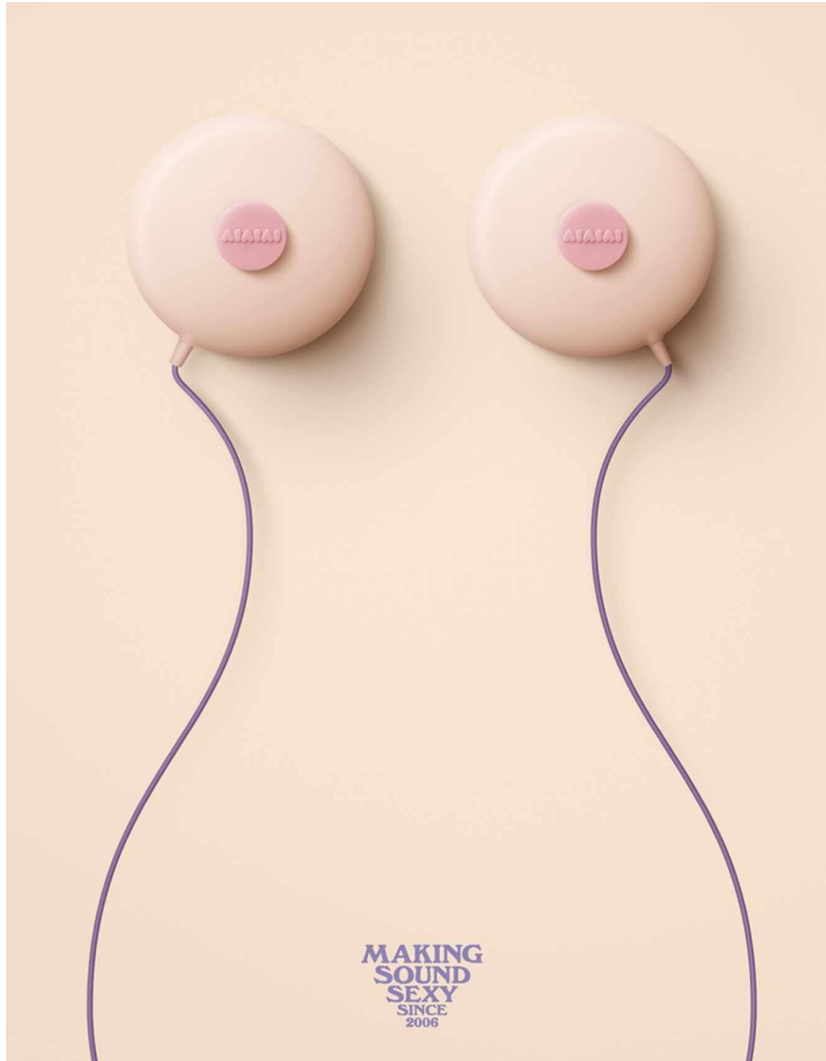


Figure 5. Advertisement for headphones. Copyright owner: AIAIAI, Copenhagen, Denmark (2013). Retrieved from: http://www.adsoftheworld.com/media/print/aiaiai_sexxy

Figure 6 advertises Toblerone, the popular chocolate bar with a triangular shape. The image represents a triangle (musical instrument), which recalls the shape of the chocolate bar. Moreover, the slogan (*Music to your mouth*) suggests a cross-domain mapping between the hearing and the taste sensory modality, which are metonymically cued in the image by exploiting the similarity in shape between the chocolate bar and the musical instrument. As already indicated in the analysis of Figure 4, this slogan can also be seen as a variation of the existing expression *Music to your ears*. In this case, the variation is even simpler than in Figure 4; here, the word *ear* is simply substituted with *mouth*. Both words designate body parts, which are tightly related to the sensory modalities of hearing and taste respectively, by means of metonymies. Therefore, the sensory target of the linguistic synaesthesia in Figure 6 is taste (*mouth*), and the source is

hearing (*music*). We argue that in this case the synaesthesia is co-constructed by graphic and linguistic means. In fact, without the support of the linguistic element it would be rather difficult (though not impossible) to establish the cross-domain association and thus to interpret the advertisement.

The similarities between Figure 6 and Figure 4 may lead the reader to think that the type of synaesthetic metaphor featured by the two images is the same. However, we classified Figure 4 as an instance of linguistically conveyed synaesthetic metaphor, and Figure 6 as an instance of visually and linguistically conveyed synaesthetic metaphor. The motivation is the following. In Figure 4, the advertised product is fully represented. The visual elements evoke a Southern environment and atmosphere, without embedding any synaesthetic transfer, *per se*. If the slogan was taken off, the image would be perfectly plausible and the message understandable, and it would not contain synaesthetic transfers. In other words, the synaesthetic elements are only conveyed linguistically. Conversely, in Figure 6, the product is not represented; the background does not contribute to provide any contextual clues for interpreting the message. Only the logo in the right corner (which metonymically stands for the advertised product) helps the viewer to identify the target of the visual metaphor: the Toblerone chocolate bar. The linguistic slogan, in this figure, interacts with the visual elements in a different way, compared to Figure 4. While in Figure 4 if the slogan was taken off, the image would still work, even though without any synaesthetic transfer, if the slogan was taken off in Figure 6, then the image would arguably become more difficult to understand, and open to different possible interpretations, which may possibly encompass some sort of synaesthetic transfer, but not necessarily. The slogan in Figure 6, therefore, contributes to construct a synaesthetic metaphor, together with the visual clues.



Figure 6. Advertisement for a chocolate bar. Copyright owner: H&C Leo Burnett Beirut advertising agency, Lebanon (2003). Retrieved from: <https://www.coloribus.com/adsarchive/prints/toblerone-chocolate-music-5234155/>

5.2.2 Visual representation of a linguistic synaesthesia

Figure 7 presents a different type of interaction between the two modes used to convey the commercial message. The advertised product is a hamburger produced by the fast food restaurant chain Burger King. In the image, the hamburger is depicted on the eyelid of a woman. The slogan that accompanies the image is: *Get a tasty new look*.

The image by itself appears to be quite ambiguous: the viewer sees an eye (which may point to sight) and a hamburger (which may point to taste) graphically combined, but cannot easily make sense of this association. In other words, while it may be easy to understand that there is an intended (metaphorical) connection between the eye and the hamburger, the intended meaning of such connection remains quite obscure, if we only consider the visual elements. By taking into account the logo of the company, however, the viewer will probably realize that the advertised product is the hamburger. Since the most salient properties advertised for food usually relate to taste, in this interpretation taste would be the target sensory modality, leaving sight in the role of the source. However, the slogan reverses this expectation, because in the (creative) linguistic synaesthesia *tasty new look* taste is the source sensory modality and sight is the target sensory modality; the positive evaluation attached to the word *tasty* is mapped from taste

to sight. In Figure 7, therefore, the image can arguably be interpreted as visual ‘translation’ of the linguistic synaesthesia of the slogan. The latter helps the consumer to disambiguate the image by suggesting the correct identification of source and target modalities: although the advertised product is a hamburger, the sensory target is not its taste, but its (new) visual appearance.



Figure 7. Advertisement for a hamburger. Copyright owner: Burger King Netherlands (2012). Retrieved from: <http://creativity-online.com/work/burger-king-netherlands-tasty-new-look/26980>

Figure 8 advertises a soft drink that has lemon as its main ingredient. The image displays a lemon wearing a pointy studded mask, also called S&M mask. The slogan says: *L&P sour lemon. Sharp as. Bit different aye.*

As in Figure 7, the image by itself is ambiguous and the intended message obscure, but the slogan contains keywords that help interpreting it. In particular, the word *sharp* triggers the sensory domain of touch, and the word *sour* points to the sensory domain of taste. In language, *sharp taste* is a conventional synaesthesia, which is plausibly processed as lexical disambiguation, where *sharp* is a polysemous word that can define both tactile and gustatory experiences.⁴ Although the linguistic synaesthesia *sharp taste* is not explicitly present in the advertisement, it is arguably evoked in the viewer’s mind by the words in the slogan. If our interpretation is correct, the image is

then to be viewed as a visual representation of *sharp taste*, with the concept of 'sharpness' conveyed by the pointy studded mask, and that of 'taste' represented by the lemon. In addition, it is possible that the brand, L&P, depicted in the same color and style as the mask on the lemon, suggests the name of this type of mask (S&M).



Figure 8. Advertisement for a soft drink. Copyright owner: Saatchi & Saatchi, New Zealand (2013). Retrieved from: https://www.adsoftheworld.com/media/print/lp_sour_mask

5.3 Visual synaesthesia

The advertisements included in this class are synaesthetic because they feature a synaesthesia that is conveyed by elements of the image; if present, the information conveyed through language is not relevant to construct or understand the synaesthesia.

Figure 9 displays an advertisement for a brand of headphones. The slogan under the logo says: *Keep the real world outside*. While none of the words included in the slogan evoke a specific sense, the image clearly points to two different sensory modalities. On the one hand, the advertised product, that is the headphones, points to hearing. On the other hand, what immediately strikes the viewer is the contrast between what is inside the space delimited by the headphones, and what is outside of it. This contrast is mainly based on the presence (inside) vs absence (outside) of color. Color is, par excellence, a visual property: sight can therefore be considered as the second sensory modality that is evoked by the image. We propose that Figure 9 features what may be called a *visual synaesthesia*, in which visual beauty (illustrated by colorfulness, as opposed to color absence) is used to qualify a hearing-related product, suggesting that it produces pleasant sounds: the positive valence that is usually associated to color, as opposed to black and white, is transferred to the advertised product. To sum up, Figure 9 features a visual synaesthesia with sight as the source sensory modality and hearing as the target sensory modality. According to our interpretation, the words that are integrated in the black-and-white image background do not have an impact on the construal of the visual synaesthesia.

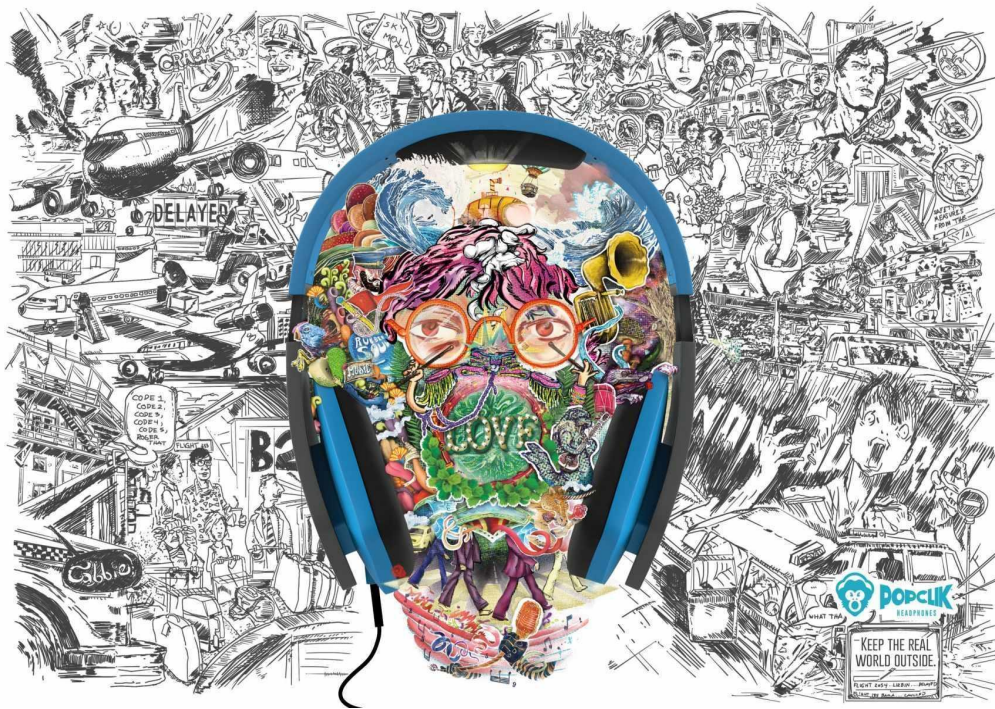


Figure 9. Advertisement for headphones. Copyright owner: Y&R/Bravo, Miami, USA (2014). Retrieved from:
http://www.adsoftheworld.com/media/print/popclik_headphones_beatles

Figure 10 is an advertisement for an ice cream company. The ice cream is broken down into its basic ingredients and visually aligned to a violin, which is also broken down into its constituting parts. The logo of the company is represented on the ice-cream stick; there is no slogan. A first inference may suggest that the product tastes good because it is genuine and only contains simple and natural ingredients. At the same time, the violin metonymically evokes (arguably pleasant) music, and thus the sensory domain of hearing. The domains of taste and hearing seem to be often synaesthetically associated in advertisements, as we have previously seen in Figure 4 and Figure 6. However, while in Figures 4 and 6 this synaesthesia was also expressed linguistically, in Figure 10 the transfer from hearing to taste is not linguistically cued by a slogan, but is left to the consumer's interpretation of the image. That is, it is an instance of visual synaesthesia.

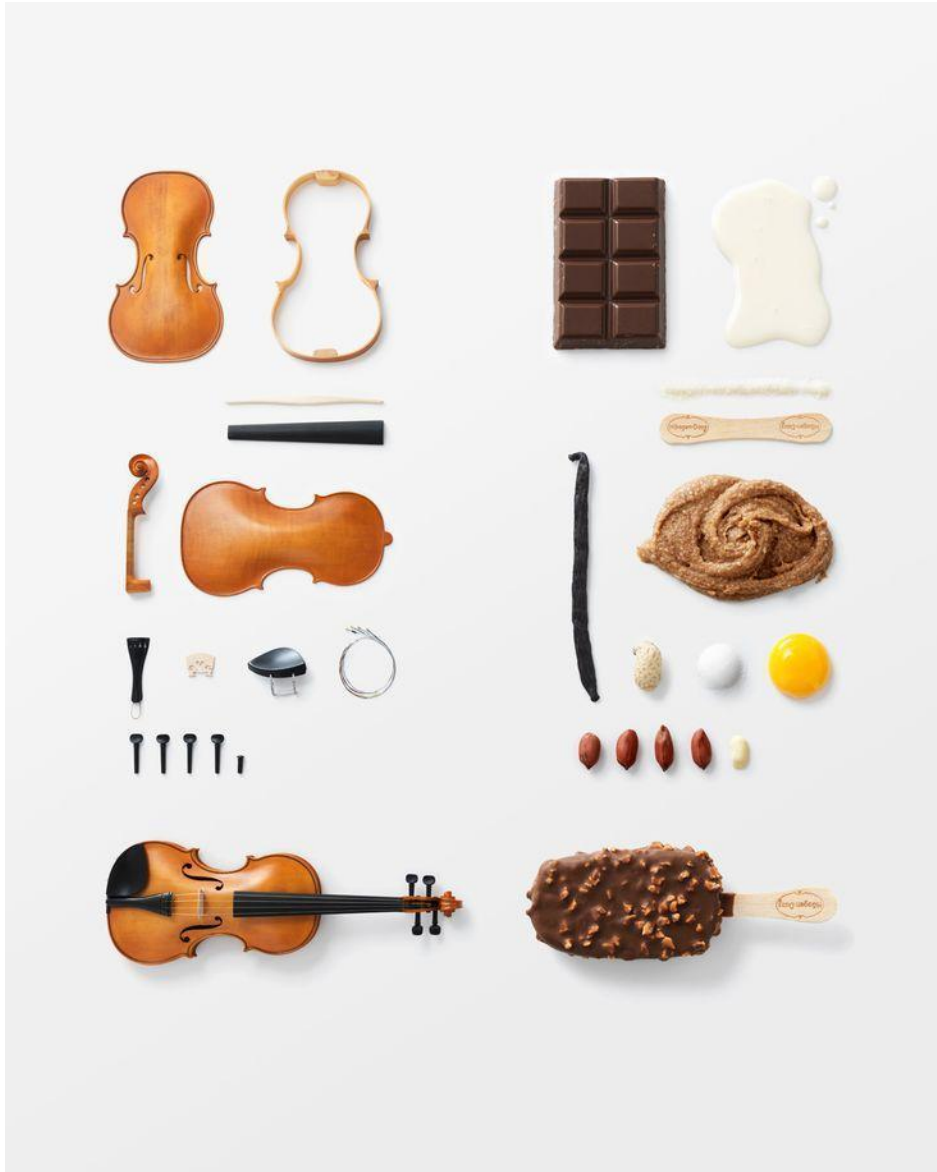


Figure 10. Advertisement for an ice cream. Copyright owner: MINK MGMT and Carl Kleiner. Retrieved from: <http://minkmgmt.com/carl-kleiner-for-haagen-dazs/>

6. Discussion and conclusions

With this contribution we aimed at exploring the role of linguistic and visual elements in the construction of synaesthetic metaphors in print advertising, by means of in-depth qualitative analyses of relevant examples. In our exploratory analysis, we proposed that, depending on the role played by language and image, advertisements featuring synaesthesia can be classified into: i) Linguistically-conveyed synaesthesia (Figure 4), ii)

Visually and linguistically conveyed synaesthesia, where image and language can interact in various ways (Figures from 5 to 8), and iii) Visually-conveyed synaesthesia (Figures 9 and 10).

Our main contribution, which is relevant to the scientific communities interested in visual communication, is to carve the field of synaesthetic metaphor, within the visual metaphor domain. Given the qualitative nature of our analysis, it is not possible to provide general observations about the frequencies with which different senses are paired in visual synaesthesia. The issue concerning the preferences in sensory associations observed for linguistic synaesthetic transfers (cf. Section 2) has therefore not been directly tackled by the present investigation. In fact, even if we had sufficient quantitative data available, we believe that the issue would not be relevant for the investigation of synaesthetic transfers in the visual mode, due to the nature of visual synaesthesia itself. While sight is a frequent target of linguistic synaesthetic transfers (as is *warm color*), in the visual mode understandably this is rarely the case. In fact, if the relevant sensory properties of the advertised product relate to sight, it is arguably not necessary to convey them through other sensory modalities, as they can be directly evoked by the visually represented product. For example, to advertise the aesthetic beauty of a dress the advertiser may directly use visual means, showing a picture of the dress itself. That is, images directly represent visual concepts, such as ‘aesthetic beauty’, ‘brightness of colors’, ‘whiteness’, etc. On the contrary, when images are used to refer to sensory concepts pertaining to other modalities, such as ‘good taste’, or ‘pleasant sound’, the images are used as pointers toward these concepts, they do not represent them directly. This gives sight a different status, compared to the other sensory modalities, in visual communication. Conversely, in verbal communication, words that describe sensory properties hold the same status, independently of the sensory modality to which they relate (possibly with the exception of onomatopoeic words, which have a privileged connection with hearing).

Although our study does not contain claims related to the cognitive processing of visual synaesthesia in print advertising, the classification that we proposed might serve to select different types of stimuli, to perform psychological experiments aimed at testing the effective activation of different sensory domains. Moreover, based on our classification, future psycholinguistic experiments may investigate how, specifically, words and images exploit the different affordances of each mode, in the construction of synaesthesia. On this point, as we already observed in the analysis of Figure 8, the image provides a creative manifestation of an expression that is conventional in language. While *sharp taste* is a conventional synaesthetic expression in language, a lemon with a S&M mask is a rather original and creative instance. A psycholinguistic study could further investigate to what extent images are used to “revitalize” synaesthetic expressions that are conventional in language, therefore constructing deliberate synaesthetic metaphors, where deliberateness is operationalized as the ability to change the standpoint of the viewer on a given topic (cf. Steen, 2013).

Some tentative theoretical considerations that tackle the cognitive processing of synaesthetic constructions can already be formulated, especially in relation to the genre hereby analyzed, i.e. print advertising.

The genre of advertising has the following peculiarity: ads have to be remembered, so that consumers are pushed to buy more of a specific product. In this sense, an advertisement is successful if it is ‘stuck’ in the consumers’ memory system and associated with positive evaluations, so that consumers will activate that knowledge when they are shopping. In the fields of cognitive linguistics, psychology and cognitive science, scholars have been arguing for the past 30 years that cognition is embodied and distributed, i.e. that it shares neural substrates with perception and action, and that such substrates are distributed across brain areas, rather than being locked in an individual brain module (see for example Pecher and Zwaan, 2005; Barsalou, 2008). This implies that when we think, and we process and understand external input (which can be expressed by words, images, or other modalities), we activate in our mind a network of connections that link the stimulus to other knowledge that we had previously stored in mind. This includes previous linguistic and perceptual experiences. Within the grounded and embodied cognition framework, the set of knowledge that we activate in relation to a given stimulus constitutes a conceptual representation of the given stimulus. For example, when hearing the word *apple*, we may activate a complex network of knowledge that relates to apples. Such complex network constitutes our conceptual representation of *apple*. Within this complex structure, according to the grounded cognition framework, it is possible to distinguish properties that relate to the various sensory modalities: gustatory properties, visual properties, etc. In other words, a concept may be encoded in our mind through different types of modality-specific representations, each featuring properties that relate to a specific sensory modality. These modality-specific representations are then integrated into a multimodal conceptual representation (e.g., Barsalou, 1999; Pecher et al., 2003). Empirical work in support of the multimodal nature of conceptual representations, and the role that sensory-based perceptual simulations play in language comprehension, have been provided by means of behavioral and neuroscientific studies. For example, Pecher et al. (2003) showed through a property verification tasks the cost effect of switching modalities. That is, participants are faster to judge that *white* is a property of *snow* after they judged *yellow* as a property of *lemon* (both stimuli relate to the visual modality) rather than after judging *loud* as a property of *blender* (auditory modality). Similarly, Paivio (1971, 2010) has suggested that conceptual representations are organized in a way that matches the organization of perception, i.e. they are multimodal and distributed across specialized neural regions. Studies of patients with category-specific semantic deficits have been used as a basis for arguing for multimodal representations. In addition to the behavioral evidence, neuroimaging techniques have recently produced converging evidence supporting the idea of a distributed multimodal semantic system (for reviews, see Binder, 2009; Martin, 2007; McRae and Jones, 2013). For example, Simmons et al. (2007) showed that when people process color words (e.g., *white*), neural areas within the visual cortex become active. Conversely, when participants process words for which the auditory modality is important (e.g., *telephone*), then auditory areas are activated (Kiefer et al., 2008).

If the idea of multiple perception-based conceptual representations is plausible, then it would mean that an advertisement that can trigger multiple representations, by connecting distant sensory domains, has a higher chance to be remembered. Our preliminary study of synaesthesia in print advertising relates to these findings, as well as to the recent studies in multisensory branding outlined in Section 3. In other words, the

product to be sold is advertised in a way that triggers different modality-specific representations of the underlying concept; we argue that, by anchoring the product in our memory through different modality-specific representations of the underlying concept, the product has a better chance to be retained. Empirical studies in this direction are still missing, but we hope to have raised the reader's interest about this type of multimodal constructions, and we hope that our classification can be used to select materials to be used as stimuli in empirical studies aimed at testing (among other variables) the effectiveness of multisensory vs. monosensory advertisements. To conclude, we believe that the present investigation opens the road to the formulation of research questions that can be tested in empirical studies, and that may be of interest not only for metaphor scientists, but also for cognitive scientists and marketing researchers.

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Conflict of Interest Statement

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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1. The scientific literature has not yet reached an agreement on how many senses there are, as it depends on the criteria used to individuate them (Goldstein, ed., 2010; Macpherson, ed., 2011; Møller, 2012; Zimmer, 2015). The literature on linguistic synaesthesia, however, usually adopts the traditional five senses classification (among others, Shen and Gil, 2008; Strik Lievers 2015; Zhao et al., forth.): dealing with sensory concepts rather than with actual perceptual experiences, the deeply rooted five-senses folk model seems to be the most adequate one, at least when investigating Western

cultures and languages. In this paper, where we analyze advertisements created by and targeted at speakers of English, we therefore follow this tradition of study.

2. Multiple factors should be taken into consideration in order to explain the fact that some senses tend to be associated more often than others in linguistic synaesthetic metaphors. For example, differences among sensory modalities as concerns part-of-speech distribution may play a role: given that most synaesthetic metaphors have the form ‘adjective/source –noun/target’ (as in warm voice), and given that, for instance, hearing is poor in adjectives compared to the other senses, then it is not surprising that hearing rarely functions as a source of synaesthetic transfers (Strik Lievers, 2015; Strik Lievers and Winter 2018). Another relevant factor is the emotional valence associated to sensory lexemes: given that ‘part of the content that is mapped in cross- modal metaphors is evaluative rather than perceptual’ (Winter, 2016a: 152), and given that, for example, taste and smell words are particularly emotionally and evaluatively loaded (Winter, 2016b), then it is not surprising that taste and smell function more often as sources rather than as targets of synaesthetic transfers. These and other factors contribute in determining the preferences that have been observed for sensory combinations in linguistic synaesthesia.

3. All images are protected by copyright, which remains property of the image creators. We are hereby showing the images for academic (educational) non-commercial purposes.

4. According to some authors, adjectives like *sharp* should rather be considered as ‘psychologically primitive concepts spanning all domains of sensory experience’ (Rakova, 2003: 142; cf. also Paradis, 2015). For a critical discussion of this position, cf. Strik Lievers, 2017.

References

- Akpınar, Ezgi & Berger, Jonah. 2015. Drivers of cultural success: The case of sensory metaphors. *Journal of Personality and Social Psychology*, 109(1). 20-34
- Barsalou, Lawrence. 1999. Perceptual symbol system. *Behavioral and Brain Sciences* 22. 577–660.
- Barsalou, Lawrence. 2008. Grounded cognition: Past, present, and future. *Topics in Cognitive Science* 2(4). 716-724.

- Barthes Roland (1977[1964]). Rhetoric of the image. In Roland Barthes, *Image, Music, Text*. Trans. Stephen Heath, 32–51. London: Fontana Press.
- Binder, Jeffrey, Rutvik H. Desai, William W. Graves & Conant, Lisa L. 2009. Where is the semantic system? A critical review and meta-analysis of 120 functional neuroimaging studies. *Cerebral Cortex* 19(12). 2767–2796.
- Binet, Les, Daniel Müllensiefen & Gawain Morrison. 2015. Marketing to the senses: music gets under your skin. *Admap*. 2-7.
- Bolognesi, Marianna, Romy Van den Heerik R. & Ester Van den Berg E. forth. VisMet: a corpus of visual metaphors. In Gerard Steen (ed.), *Visual Metaphor: structure and process*. Amsterdam: John Benjamins.
- Bolognesi, Marianna. 2017. Conceptual metaphors and metaphorical expressions in images. In Annalisa Baicchi & Erica Pinelli (eds.), *Cognitive Modelling in Language and Discourse across Cultures*, 367-383. Cambridge: Cambridge Scholars Publishing.
- Caballero, Rosario, & Carita Paradis. 2015. Sensory Perceptions in Language and Cognition. Special issue of *Functions of Language*, 22(1).
- Citron, Francesca M. M., & Adele Goldberg. 2014. Metaphorical sentences are more emotionally engaging than their literal counterparts. *Journal of Cognitive Neuroscience* 26. 2585-2595.
- Citron, Francesca M. M., Jeremie Güsten, Nora Michaelis, & Adele E. Goldberg. 2016. Conventional metaphors in longer passages evoke affective brain response. *NeuroImage* 139. 218-230.
- Dombi, Erzsébet. 1974. Synaesthesia and poetry. *Poetics* 3(3). 23-44.
- El Refaie, Elisabeth. 2003. Understanding visual metaphor: The example of newspaper cartoons. *Visual Communication* 2(1). 75-95.

- Feng, W. D. 2017. Metonymy and visual representation: towards a social semiotic framework of visual metonymy. *Visual Communication* 6(4). 441-466.
- Forceville, Charles & Eduardo Urios-Aparisi (eds.). 2009. *Multimodal Metaphor*. Berlin: Mouton de Gruyter.
- Forceville, Charles. 1996. *Pictorial Metaphors in Advertising*. Routledge: London.
- Forceville, Charles. 2006. Multimodal metaphor in ten Dutch TV commercials. *Public Journal of Semiotics* 1(1). 19-51.
- Forceville, Charles. 2008a. Metaphor in pictures and multimodal representations. In Raymond W. Gibbs, Jr. (ed.), *The Cambridge Handbook of Metaphor and Thought*, 462-482. Cambridge: Cambridge University Press
- Forceville, Charles. 2008b. Pictorial and multimodal metaphor in commercials. In: Edward F. McQuarrie & Barbara J. Phillips (eds), *Go Figure! New Directions in Advertising Rhetoric*. 272-310. Armonk NY: ME Sharpe.
- Forceville, Charles. 2009. Metonymy in visual and audiovisual discourse. In: Elija Ventola & Arsenio Jesús Moya Guijarro (eds.), *The World Told and the World Shown: Issues in Multisemiotics*, 56-74. Basingstoke/New York: Palgrave MacMillan.
- Forceville, Charles. 2012. Creativity in pictorial and multimodal advertising metaphors. In Rodney Jones (ed.), *Discourse and Creativity*, 113-132. Harlow: Pearson/Longman.
- Goldstein, E. Bruce (ed.) (2010). *Encyclopedia of Perception*. Newbury Park, C. A.: Sage.
- Hidalgo Downing, Laura and Blanca Kraljevic. (2011) Multimodal metonymy and metaphor as complex discourse resources for creativity in ICT advertising discourse.

Annual Review of Cognitive Linguistics. Special Issue on Metaphor and Metonymy. 9:1, 153-178.

Holz, Peter. 2007. Cognition, olfaction and linguistic creativity: linguistic synesthesia as poetic device in cologne advertising. In: Martina Plümacher & Peter Holz (eds.), *Speaking of Colors and Odors*, 185–202. Amsterdam: John Benjamins.

Howes, David. 2007. Multi-Sensory Marketing in Cross-Cultural Perspective (part I): From Synergy to Synaesthesia, available at http://www.perceptnet.com/cien01_07_ang.htm

Hultén, Beril. 2011. Sensory marketing: the multi-sensory brand- experience concept. *European Business Review* 23(3). 256–73.

Hupé, Jean-Michel & Michel Dojat. 2015. A critical review of the neuroimaging literature on synesthesia. *Frontiers in Human Neuroscience* 9. Article 103.

Kiefer, Markus, Eun-Jin Sim, Bärbel Herrnberger, Jo Grothe & Klaus Hoenig. 2008. The Sound of Concepts: Four Markers for a Link between Auditory and Conceptual Brain Systems. *Journal of Neuroscience* 28(47), 12224-12230.

Kitchen, Philip. (ed.) 2008. *Marketing Metaphors and Metamorphosis*. Basingstoke, UK: Palgrave McMillan.

Knoeferle, Klemens M., Pia Knoeferle, Carlos Velasco, & Charles Spence. 2016. Multisensory brand search: How the meaning of sounds guides consumers' visual attention. *Journal of Experimental Psychology: Applied*, 22(2). 196-210

Krishna, Aradhna 2012. An integrative review of sensory marketing: Engaging the senses to affect perception, judgment and behavior. *Journal of Consumer Psychology* 22(3). 332-351.

- Krishna, Aradhna, & Norbert Schwarz. 2014. Sensory marketing, embodiment, and grounded cognition: A review and introduction, *Journal of Consumer Psychology* 24(2). 159-168.
- Krishna, Aradhna. 2013. *Customer Sense: How the 5 Senses Influence Buying Behavior*. New York: Palgrave Macmillan.
- Lindstrom, Martin. 2005. *Brand Sense: How to Build Powerful Brands Through Touch, Taste, Smell, Sight and Sound*. New York: Free Press.
- Littlemore, Jeannette, & Paula Pérez Sobrino. 2017. Eyelashes, speedometers or breasts? An experimental cross-cultural approach to multimodal metaphor and metonymy in advertising. *Textus* 30(1). 197-222.
- Lund, Curtis. 2015. Selling through the senses: Sensory appeals in the fashion retail environment. *Fashion Practice* 7(1). 9-30.
- Macpherson, Fiona (ed.). 2011. *The Senses: Classic and Contemporary Philosophical Perspectives*. Oxford: Oxford University Press.
- Macpherson, Fiona. 2007. Synaesthesia, functionalism and phenomenology. In Massimo Marraffa, Mario De Caro, & Francesco Ferretti (eds.), *Cartographies of the Mind: Philosophy and Psychology in Intersection*, 65–80. Dordrecht: Springer.
- Martin, Alex. 2007. The representation of object concepts in the brain. *Annual Review of Psychology* 58. 25–45.
- McQuarrie, Edward F., & Barbara Phillips. 2005. Indirect persuasion in advertising: How consumers process metaphors presented in pictures and words. *Journal of Advertising*, 34(2), 7-20.
- McQuarrie, Edward F., & Glen Mick. 2003. The contribution of semiotic and rhetorical perspectives to the explanation of visual persuasion in advertising. In L. Scott & R.

Batra (Eds.), *Persuasive Imagery: A Consumer Response Perspective*, 191– 221.
Mahwah, NJ: Lawrence Erlbaum.

McRae, Ken & Michael Jones. 2013. Semantic memory. In Daniel Reisberg (ed.), *The Oxford Handbook of Cognitive Psychology*, 206-219. Oxford: Oxford University Press.

Møller, Aage R. (2012). *Sensory Systems: Anatomy and Physiology* (2nd Ed.).
Richardson: A. R. Møller Publishing.

Nelson, Michelle R. & Jacqueline C. Hitchon. 1995. Theory of synesthesia applied to persuasion in print advertising headlines. *Journalism & Mass Communication Quarterly* 72. 346-360.

Nelson, Michelle R. & Jacqueline C. Hitchon. 1999. Loud tastes, colored fragrances, and scented sounds: how and when to mix the senses in persuasive communications. *Journalism & Mass Communication Quarterly* 76. 354-372.

Paivio, Allan. 1971. *Imagery and Verbal Processes*. New York: Holt, Rinehart, and Winston.

Paivio, Allan. 2010. Dual coding theory and the mental lexicon. *The Mental Lexicon* 5, 205–230.

Paradis, Carita. 2015. Conceptual spaces at work in sensuous cognition: Domains, dimensions and distances. In Frank Zenker & Peter Gärdenfors (eds.). *Applications of Conceptual spaces: Geometric knowledge representation*, 33-55. Dordrecht: Springer Verlag.

Pecher, Diane & Rolf A. Zwaan. 2005. *Grounding Cognition: The Role of Perception and Action in Memory, Language, and Thinking*. Cambridge: Cambridge University Press.

- Pecher, Diane, Renz Zeelenberg & Lawrence W. Barsalou. 2003. Verifying conceptual properties in different modalities produces switching costs. *Psychological Science* 14. 119-124.
- Peck, Joann & Terry L. Childers. 2008. If it tastes, smells, sounds, and feels like a duck, then it must be a....: Effects of sensory factors on consumer behaviors. In Curtis P. Haugtvedt, Paul M. Herr, Frank R. Kardes (eds.), *Handbook of consumer psychology*, 193–219. Psychology Press, Florence, KY.
- Pérez-Sobrino, Paula, & Jeannette Littlemore. forthcoming. Cross-cultural variation in the reception of advertisements. *Applied Linguistics*.
- Pérez-Sobrino, Paula. 2016. Multimodal metaphor and metonymy in advertising: A corpus-based account. *Metaphor & Symbol* 31(2). 73-90.
- Pérez-Sobrino, Paula. 2017. *Multimodal Metaphor and Metonymy in Advertising*. Amsterdam: John Benjamins.
- Phillips, Barbara J. & Edward F. McQuarrie. 2004. Beyond visual metaphor: A new typology of visual rhetoric in advertising. *Marketing Theory* 4. 113-136.
- Phillips, Barbara J., & Edward F. McQuarrie. 2002. The development, change, and transformation of rhetorical style in magazine advertisements 1954–1999. *Journal of Advertising*, 31(4), 1–13.
- Poppi, Fabio, Marianna Bolognesi & Amitash Ojha. under review. Imago Dei: Metaphorical conceptualization of artistic paintings within a participant-based framework.
- Rakova, Marina. 2003. *The Extent Of The Literal: Metaphor Polysemy And Theories Of Concepts*. London: Palgrave Macmillan.
- Schifferstein, Hendrik. N. J. & Pieter M.A., Desmet. 2008. Tools facilitating multi-sensory product design. *Design Journal* 11(2). 137–58.

- Shen, Yeshayahu & David Gil. 2008. Sweet fragrances from Indonesia: A universal principle governing directionality in synaesthetic metaphors. In Jan Auracher & Willie van Peer (eds.), *New Beginning or the Study of Literature*, 49-72. Cambridge: Cambridge Scholars Publishing.
- Simmons, Kyle, Vimal Ramjee, Michael S. Beauchamp, Ken McRae, Alex Martin & Lawrence W. Barsalou. 2007. A common neural substrate for perceiving and knowing about color. *Neuropsychologia* 4. 2802–2810.
- Simner, Julia & Edward M. Hubbard (eds.). 2013. *Oxford Handbook of Synesthesia*. Oxford: Oxford University Press.
- Simner, Julia. 2012. Defining synaesthesia. *British Journal of Psychology* 103. 1-15.
- Šorm, Ester & Gerard J. Steen. 2013. Processing visual metaphor. *Metaphor and the Social World* 3(1). 1-34.
- Spangenberg, Eric R., Bianca Grohmann, David E. Sprott. 2005. It's beginning to smell (and sound) a lot like Christmas: The interactive effects of ambient scent and music in a retail setting. *Journal of Business Research* 58(11). 1583-1589.
- Spence, Charles, Nancy M. Puccinelli, Dhruv Grewal, & Anne L. Roggeveen. 2014. Store atmospherics: A multisensory perspective. *Psychology & Marketing*, 31(7). 472–488.
- Strik Lievers, Francesca & Bodo Winter. 2018. Sensory language across lexical categories. *Lingua* 204. 45-61.
- Strik Lievers, Francesca. 2015. Synaesthesia: A corpus-based study of cross-modal directionality. *Functions of Language* 22(1). 69-95.
- Strik Lievers, Francesca. 2017. Figures and the senses. Towards a definition of synaesthesia. *Review of Cognitive Linguistics* 15(1). 83-101.

- Tsur, Reuven. 2007. Issues in literary synaesthesia. *Style* 41, 30-52.
- Tynan, Caroline, Sally McKechnie, & Celine Chhuon. 2006. Co-creating value for luxury brands. *Journal of Business Research*, 63 (11): 1156-63.
- Ullmann, Stephen. 1957. *The Principles of Semantics*, 2nd edition. Oxford: Blackwell.
- van Hooft, A., van Mulken, M., & Nederstigt, U. 2013. Cultural differences? Visual metaphor in advertising: Comprehension and tolerance of ambiguity in four European countries. In Sara Rosengren, Micael Dahlén & Shintaro Okazaki (eds.), *Advances in Advertising Research*, Vol. IV, 351-364. Wiesbaden: Springer.
- von Wallpach, Sylvia & Maria Kreuzer. 2013. Multi-Sensory Sculpting (MSS): Eliciting Embodied Brand Knowledge via Multisensory Metaphors. *Journal of Business Research*, 66(9). 1325–31.
- Winter, Bodo. 2016a. *The Sensory Structure of the English Lexicon*. Unpublished PhD Thesis, University of California, Merced.
- Winter, Bodo. 2016b. Taste and smell words form an affectively loaded and emotionally flexible part of the English lexicon. *Language, Cognition and Neuroscience* 31(8). 975-988.
- Yu, Ning. 2003. Synesthetic metaphor: A cognitive perspective. *Journal of Literary Semantics* 32(1). 19–3.
- Zhao, Qingqing, Huang, Chu-Ren, & Long, Yunfei. forth. Synaesthesia in Chinese: A corpus-based study on gustatory adjectives in Mandarin, *Linguistics*.
- Zimmer, Renate (2015). *Handbuch der Sinneswahrnehmung: Grundlagen einer ganzheitlichen Bildung und Erziehung*. Verlag Herder GmbH.