Refining replacements. Validating a revised typology of visual metaphor using perceived processing fluency and aesthetic pleasure

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ABSTRACT

A renowned classification of visual metaphor (depicting e.g. TOOTHPASTE IS DIAMOND) is the one by Phillips and McQuarrie differentiating between juxtaposition, fusion and replacement. Replacements are oftentimes treated as one unambiguous construct. We reason that there are three disparate replacement types varying in audience responses because of differences in presence and type of visual context: 1) source without target context (e.g. diamond on neutral background), 2) source in target context (e.g. diamond on toothbrush) and 3) target in source context (e.g. tube of toothpaste on ring). We validated our refinement in an experiment with replacement type as within-subjects factor and perceived processing fluency and aesthetic pleasure as dependent variables. Metaphor comprehension was also taken into account. Participants saw 6 ads (2 per replacement type) for fictitious brands. Overall, perceived processing fluency and aesthetic pleasure were highest for source in target context ads. Source without target context ads and target in source context ads were perceived as equally fluent to process and aesthetically pleasing. For comprehended metaphors, perceived processing fluency was higher for target in source context ads than for source without target context ads. This study shows that Phillips and McQuarrie's replacement category needs to be refined. Studies comparing replacements with juxtapositions and fusions need to be wary of the crucial role of visual context. Replacements showing the source object in the context of the target (e.g. diamond on toothbrush) outperform the other replacement types.

Introduction

The use of visual metaphors is a favoured strategy in advertising. Instead of simply showing the brand's new product, advertisers show two objects and suggest that

they are figuratively alike, e.g. a toothpaste advertisement showing a diamond on a toothbrush. The audience has to relate the target object (i.e. toothpaste) to the source object (i.e. diamond). The target can be understood in terms of the source because they share the attribute 'shiny' (cf. Forceville 1996; Phillips 2003).

Visual metaphors can be presented using different visual structures, which refers to the way two pictorial elements constituting the rhetorical figure are physically presented in the advertisement: juxtapositions, fusions and replacements (Phillips and McQuarrie 2004). The most complex visual structure is a replacement, which Phillips and McQuarrie (2004) define as '… to have one [image element] replace the other in such a way that the present image calls to mind the absent image' (117). Because one element is missing, the audience has to infer the missing element in order to understand the ad's intended meaning. However, Phillips and McQuarrie's definition of replacement leaves room for multiple interpretations and researchers operationalize this metaphor structure in different ways (e.g. Chang et al. 2018; Madupu, Sen, and Ranganathan 2013; Ryoo, Jeon, and Sung 2020). For example, van Mulken, van Hooft, and Nederstigt (2014) use replacement ads in which only the source object is shown on a neutral background (e.g. a bar of gold in an ad for an expensive watch) but also replacement ads in which the source is shown in a context that hints at the target (e.g. a pearl in a mouth in an ad for chocolate candy).

In this study, we propose to refine the Phillips and McQuarrie (2004) replacement category into its three possible instantiations:

1. Replacements in which the source object is shown on a neutral background (i.e. source without target context).
2. Replacements in which only the target object is shown and the background hints at the source object (i.e. target in source context).
3. Replacements in which only the source object is shown and the background hints at the target object (i.e. source in target context).

These three replacement types differ in the presence of visual context and type of visual context (i.e. visual anchoring, van Enschot and Hoeken 2015). Based on processing fluency theory (Forster 2020; Reber, Schwarz, and Winkielman 2004; Schwarz 2018) and the Resource Matching Hypothesis (Larsen, Luna, and Peracchio 2004; Ryoo, Jeon, and Sung 2020), we argue that the three replacement types will yield different outcomes with regard to perceived processing fluency and aesthetic pleasure.

Processing fluency theory is an acclaimed theory in the field of empirical aesthetics (Forster 2020; Reber, Schwarz, and Winkielman 2004; Schwarz 2018) and links processing fluency to aesthetic pleasure: 'The more fluently perceivers can process an object, the more positive their aesthetic response' (Reber, Schwarz, and Winkielman 2004, 365). However, a visual metaphor contains a visual incongruity (e.g. toothpaste is not a diamond in a literal sense; Schilperoord 2018; Gkiouzepas and Hogg 2011; McQuarrie and Mick 1999) which may yield disfluent processing. This raises the question whether the positive correlation between perceived processing fluency and aesthetic pleasure holds for the three replacement types. We argue that this may still be the case based on the Resource Matching Hypothesis (RMH) (Larsen, Luna, and

Peracchio 2004; Ryoo, Jeon, and Sung 2020). The RMH suggests that – in order to experience maximum pleasure – a balance is needed between the audience's available and required cognitive resources to solve the riddle. Replacements are the most complex metaphor structure with the highest processing demands (Phillips and McQuarrie 2004). As for the three replacement types, the required resources and available resources will arguably be in balance – and aesthetic pleasure will be highest – for the replacement type which is most fluent to process. This balance will be lost when a replacement type becomes less fluent to process resulting in less aesthetic pleasure.

Ultimately, the visual metaphor in an ad needs to be comprehended. The incongruity of the visual metaphor needs to be solved. When the audience is able to relate the target object to the source, an Aha moment can be experienced i.e. 'sudden appearance of a solution through insight' (Topolinski and Reber 2010, 402). The audience enjoys solving the riddle which may result in more aesthetic pleasure (Phillips 1997; van Mulken, van Hooft, and Nederstigt 2014).

According to Phillips and McQuarrie (2004), typologies of visual metaphor are only meaningful when they are tied to differences in audience responses. Therefore, we validated our refinement of the replacement category by testing the effects of the three different replacement types on perceived processing fluency and aesthetic pleasure, taking metaphor comprehension into account. This clears the way for further research testing the assumed cognitive and affective responses to juxtapositions versus fusions and replacements (e.g. Phillips and McQuarrie 2004; van Mulken, van Hooft, and Nederstigt 2014). Our research question is:

> RQ: How do different replacement types affect perceived processing fluency and aesthetic pleasure, and how are these effects influenced by metaphor comprehension?

Theoretical framework

Visual metaphors

The use of visual metaphors is a popular strategy in advertising. Visual metaphors present us with puzzles which, compared to literal messages, attract more attention (McGuire 2000), enhance cognitive processing of the ads, and increase attitudes towards the ad and brand (Margariti et al. 2021; Mohanty and Ratneshwar 2016; van Mulken, van Hooft, and Nederstigt 2014; van Mulken, Le Pair, and Forceville 2010) and behavioural intentions (Jeong 2008; van Stee 2018; Sopory and Dillard 2002).

A metaphor invites a cross-domain mapping in which a target and source domain are compared in such a way that the former can be construed in terms of the latter (Lakoff and Johnson 1980). An example of a metaphor is TOOTHPASTE IS DIAMOND. The metaphor invites understanding the target object (toothpaste) in terms of the source object (diamond) through mapping of the attribute 'shiny' from source to target (cf. Forceville 1996; Phillips 2003). Metaphor is not so much a property of a certain expression but instead characterizes the way these expressions are to be processed, with the nonliteral nature of the underlying comparison as its main characteristic. This indicates that metaphor can be verbally induced but also visually or

multimodally (Forceville 1996; Forceville and Urios-Aparisi 2009; Lakoff and Johnson 1980; Pérez-Sobrino 2016).

Phillips and McQuarrie (2004) propose a typology for visual rhetorical figures consisting of two axes: meaning operation and visual structure. Meaning operation refers to the nature of the relation between the target object and the source object. Phillips and McQuarrie (2004) differentiate between connection (i.e. the target object is associated with the source object), comparison for similarity (i.e. the target object is like the source object), and comparison for opposition (i.e. the target object is not like the source object). Visual structure refers to the way in which the target and source object are presented. Phillips and McQuarrie distinguish three visual structures: juxtaposition, fusion and replacement. In a juxtaposition, the target object (toothpaste) is placed next to the source object (diamond), whereas in a fusion target and source are merged. In a replacement, one of the two objects is replaced by the other. The current study focuses on replacements while keeping the level of meaning operation constant (i.e. similarity). Similarities come closest to what is traditionally seen as metaphors (i.e. an analogy between the target object and a source object) (Phillips and McQuarrie 2004).

Based on the factor 'ease of identifying the relevant objects', Phillips and McQuarrie (2004) predict processing demands to increase from juxtaposition to fusion to replacement. It is relatively easy to identify the two elements in a juxtaposition. Identification is harder with fusions: the two elements must first be disentangled before a comparison between target and source object can be made. Replacement is claimed to have the highest processing demands as the absent element must be inferred. Empirical support for this assumption is provided by van Mulken, Le Pair, and Forceville (2010) who found that replacements are perceived as more complex than fusions which in turn are perceived as more complex than juxtapositions. As for ad appreciation, van Mulken, van Hooft, and Nederstigt (2014) found that appreciation for fusions was higher than for juxtapositions and replacements. This is in line with other studies showing an inverted U-curve pattern with the highest ad appreciation for moderately complex metaphorical stimuli (Mohanty and Ratneshwar 2016; Phillips 2000, Ryoo, Jeon, and Sung 2020).

However, Phillips and McQuarrie (2004) define replacements as: '… to have one [image element] replace the other in such a way that the present image calls to mind the absent image' (117). This definition permits different interpretations resulting in more than one instantiation of this metaphor structure in previous research (e.g. Chang et al. 2018; Madupu, Sen, and Ranganathan 2013; Ryoo, Jeon, and Sung 2020; van Mulken, van Hooft, and Nederstigt 2014). There are three possible instantiations to enable an analogy between the source object and the target object: 1) the source can be shown in isolation, 2) the target is shown in a context that hints at the source, and 3) the source is shown in a context that hints at the target. For instance, van Mulken, van Hooft, and Nederstigt (2014) used replacements in which the source object is shown on a neutral background (e.g. a bar of gold in an ad for an expensive watch) but replacements in which the source is shown in a context that hints at the target as well (e.g. a pearl in a mouth in a chocolate candy ad). The second instantiation is more in line with Phillips and McQuarrie (2004) description of replacements, with the context hinting at the absent element. In this case, the third instantiation

would be a chocolate candy attached to a pearl necklace. As we will address later, the presence and type of context arguably affect processing demands and, with that, affective responses. Ultimately, this may put the assumed cognitive and affective responses to juxtapositions versus fusions and replacements to the test.

In this study, we propose a refinement of the replacement category to its three possible instantiations. Firstly, replacement ads with and without context are distinguished. Secondly, we make a distinction within replacement ads with context: either the source is shown in the target context or – vice versa – the target is shown in the source context. This leads to the following three possible replacement types:

1. Source without target context: the source object is shown in isolation, e.g. a toothpaste advertisement showing a diamond on a neutral background.
2. Target in source context: the target object is shown with a background hinting at the source object without actually showing the source object, e.g. a toothpaste advertisement showing a tube of toothpaste on a ring.
3. Source in target context: the source object is shown with a background hinting at the target object without actually showing this object, e.g. a toothpaste advertisement showing a diamond on a toothbrush.

An example of each type can be found in Figure 1. We argue, based on processing fluency theory (Forster 2020; Reber, Schwarz, and Winkielman 2004; Schwarz 2018) and the Resource Matching Hypothesis (Larsen, Luna, and Peracchio 2004; Ryoo, Jeon, and Sung 2020), that this will yield differential outcomes with regard to perceived processing fluency and aesthetic pleasure.

Processing fluency theory and the resource matching hypothesis

Processing fluency theory is an acclaimed theory in the field of empirical aesthetics (Forster 2020; Reber, Schwarz, and Winkielman 2004; Schwarz 2018). Processing fluency is the ease of recognizing and understanding the utterance (Reber, Schwarz, and Winkielman 2004; Jakesch, Leder, and Forster, Leder, and Ansorge 2013). The theory links processing fluency to aesthetic pleasure: 'The more fluently perceivers can

Source without target context   Target in source context   Source in target context

Figure 1. Visual metaphor: Three replacement types.

process an object, the more positive their aesthetic response' (Reber, Schwarz, and Winkielman 2004, 365). The reason why high fluency is positively marked is because high fluency is associated with 'progress toward successful recognition of the stimulus, error-free processing, or the availability of appropriate knowledge structures to interpret the stimulus' (Reber, Schwarz, and Winkielman 2004, 366). This fluency of processing is metacognitive (Schwarz 2018; Unkelbach and Greifeneder 2013) and is about our 'feeling of thinking'. We feel that processing goes smoothly and this feels pleasant. Or in the words of Forster, Leder, and Ansorge (2013): 'It felt fluent, and I liked it'. Support for processing fluency theory has been found for simple patterns and objects (Reber, Winkielman, and Schwarz 1998; Winkielman and Cacioppo 2001), photographs depicting natural scenes (Tinio, Leder, and Strasser 2011), art (Leder 2003; Belke et al. 2010), brand logos (Nordhielm 2002), and advertisements (Graf and Landwehr 2017). For example, Graf and Landwehr (2017) placed products in normal versus abnormal surroundings (e.g, a chair in a living room versus a garden). The easy-to-process ads (e.g. chair in living room) evoked more aesthetic pleasure than the harder-to-process ads (e.g. chair in garden).

A difference between the stimuli in the studies described above and visual metaphors is that the latter can be considered incongruent, in that 'a literal reading yields an anomaly' (e.g. toothpaste is not a diamond in a literal sense; Schilperoord 2018, 16; Gkiouzepas and Hogg 2011; McQuarrie and Mick 1999). Visual metaphors may initially yield disfluent processing. They invite the audience to elaborate on the incongruity. According to Graf and Landwehr (2015) and Forster (2020), processing fluency theory in its basic version does not cover the possibility that people may take an active role in processing a stimulus. On top of this, as mentioned, quite some studies found a preference for not the simplest but the moderately complex metaphorical stimuli (resembling an inverted U-curve pattern: Mohanty and Ratneshwar 2016; Phillips 2000, Ryoo, Jeon, and Sung 2020; van Mulken, van Hooft, and Nederstigt 2014).

The question is whether the positive relation between perceived processing fluency and aesthetic pleasure holds for the active processing of replacements. We argue why this may be the case based on Larsen, Luna, and Peracchio (2004) Resource Matching Hypothesis (RMH) and why we do not expect an inverted U-curve pattern for the three replacement types. The RMH has been applied to visual metaphors in advertising by Ryoo, Jeon, and Sung (2020). This hypothesis suggests that 'people feel maximum pleasure and appreciation when the available resources of the viewer and the required resources to solve the riddle are balanced' (Ryoo, Jeon, and Sung 2020, 2–3). Given that we are dealing with replacements, which are assumed to induce the highest processing demands (Phillips and McQuarrie 2004), the amount of required resources is presumably quite high for all three replacement types, locating all three replacement types beyond the tipping point of the inverted U-curve. We argue that the replacement type that is the most fluent to process will strike the balance between required resources and available resources, yielding 'maximum pleasure'. This balance will be lost (i.e. required resources > available resources) when the replacement type becomes less fluent to process, with less pleasure as a consequence.

Ultimately, the visual metaphor in an ad needs to be comprehended. The incongruity of the metaphor needs to be solved. Recipients will try to understand how the target object (e.g. toothpaste) and source object (e.g. diamond) are connected,

and the level of aesthetic pleasure they experience will be a function of the extent to which they are able to arrive at a satisfactory interpretation. When the audience is able to relate the target object to the source object, an Aha moment can be experienced i.e. 'sudden appearance of a solution through insight' (Topolinski and Reber 2010, 402). Solving the riddle is a pleasant experience as it shows the audience that they have the relevant knowledge to solve the problem (Phillips 1997; van Mulken, van Hooft, and Nederstigt 2014). Support for the relationship between the Aha moment and experiencing pleasurable feelings is found in several studies on visual rhetorical figures in advertisements (Phillips 2000; van Enschot and Hoeken 2015; van Enschot, Hoeken, and van Mulken 2008).

Replacement types and perceived processing fluency

In general, the claim of an advertisement comes down to 'Product X has attribute Y' or 'Product X provides benefit Z' (Forceville 1996,104). In a replacement advertisement, only one of these elements is depicted, i.e. only the product or the attribute/benefit is shown. For example, in the advertisement showing the diamond on the toothbrush, the product (toothpaste) is absent. The three replacement types differ in the presence of context which can serve as a hint about the absent element. In the ad with the diamond on the toothbrush (source in target context), the toothbrush hints at the product, whereas in the ad with the toothpaste on the ring (target in source context), the ring hints at the source. This contextual hint is also known as anchoring (Barthes 1975; Phillips 2000). Whereas previous research mainly focused on the effects of verbal anchoring (i.e. headings explaining the visual metaphor) on comprehension, aesthetic pleasure and attitude towards the ad (Lagerwerf and Meijers 2008; Lagerwerf, van Hooijdonk, and Korenberg 2012; Phillips 2000; Ryoo, Jeon, and Sung 2020), we focus on visual anchoring (van Enschot and Hoeken 2015). Arguably, the presence of pictorial context helps the audience to interpret the implicit claim of an advertisement making the ad more fluent to process than when pictorial context is absent. Context provides explicit cues that 'link to stored knowledge in memory and thereby reduce the amount of required elaboration required to complete the interpretation' (Phillips 2000, 16). Hence, replacement ads showing the source without target context (e.g. the ad showing only the diamond) will be less fluent to process compared to the other two replacement types.

We furthermore claim that target in source context ads (e.g. toothpaste on ring) are less fluent to process compared to source in target context as (e.g. diamond on toothbrush) as the former are semantically unstable (i.e. more open, ambiguous; Muth and Carbon 2016). Target in source context ads are open to a wider range of interpretations of the product's attribute compared to source target context ads. For example, in the ad showing the diamond on the toothbrush (source in target context), the context provides the hint that the absent element – toothpaste – is in some way like a diamond. This restricts the range of possible intended attributes to the diamond's attribute (i.e. shininess). However, in the ad showing the toothpaste tube on the ring (target in source context), the context only hints at the presence of a ring. The audience could infer that the ad's meaning has something to do with jewellery. However, the range of possible attributes for 'jewellery' is substantially broader than

for 'diamond', which makes it harder for the audience to infer the ad's intended meaning (i.e. less fluent to process). We therefore hypothesize that:

> H1: Source without target context ads are perceived as less fluent to process than target in source context ads, which are perceived as less fluent to process than source in target context ads.

Replacement types and aesthetic pleasure

As mentioned, replacements are assumed to induce the highest processing demands (Phillips and McQuarrie 2004). Based on processing fluency theory (Forster 2020; Reber, Schwarz, and Winkielman 2004; Schwarz 2018) and the Resource Matching Hypothesis (Larsen, Luna, and Peracchio; Ryoo, Jeon, and Sung 2020), we posit that the replacement type that is the most fluent to process will strike the balance between required resources and available resources, yielding the most aesthetic pleasure. When the replacement type is less fluent to process, the balance between required and available resources is lost, yielding less aesthetic pleasure. Replacement ads without context may be less fluent to process compared to replacement ads with context, yielding less aesthetic pleasure. Moreover, target in source context ads (e.g. the toothpaste on the ring) may be less aesthetically pleasing than the source in the target context ads (e.g. diamond on toothbrush). The former replacement type can be processed less fluently as the context does not limit the amount of possible interpretations, making it harder for the audience to solve the puzzle. This assumption is in line with research by Ketelaar et al. (2010). They investigated the effects of open (visual metaphor without an explanatory headline) and closed (visual metaphor with an explanatory headline) on attitude towards the ad. They found that the attitude towards ads was lower for open ads. Their explanation is in line with processing fluency theory and the Resource Matching Hypothesis: participants may have experienced difficulties when looking for an interpretation of the open ads, yielding lower processing fluency and possibly a lower attitude towards the ad. We therefore hypothesize that:

> H2: Source without target context ads are perceived as less aesthetically pleasing than target in source context ads, which are perceived as less aesthetically pleasing than source in target context ads.

Other factors influencing perceived processing fluency and aesthetic pleasure

Besides replacement type and metaphor comprehension, other factors may influence perceived processing fluency and aesthetic pleasure as well and are accounted for in this study. One of these factors is comparability, which is coined as conceptual similarity by Gkiouzepas and Hogg (2011). Conceptual similarity refers to the degree of relatedness ('semantic proximity'; Gkiouzepas and Hogg 2011, 106) between the target object and source object. Arguably, a swan and an aeroplane are conceptually more similar and therefore easier to understand in combination than, for example, glue and soap. Another factor that may influence perceived processing fluency and aesthetic pleasure is the conventionality of the target-source combination (Bowdle and Gentner 2005). For instance, comparing a huge pile of work with a mountain is more

conventional than comparing a smartphone with a kangaroo. According to the Career of Metaphor Theory (Bowdle and Gentner 2005), a metaphor loses its novelty over time and becomes conventional. This means that the metaphor's intended meaning is already known to the audience. Applied to the advertising context, conventional metaphors may make it easier for the consumers to arrive at the shared attribute of the source object and the target object. We accounted for comparability and conventionality of the metaphors in the selection of our experimental stimuli. A third factor that could possibly be of influence is artful deviation, which refers to the extent of deviation of the form of a message from the audience's expectations (McQuarrie and Mick 1996, 1999; Phillips and McQuarrie 2004). All visual structures of a metaphor can be seen as artfully deviant (Phillips and McQuarrie 2004), but the level of deviation or incongruity can vary affecting consumer responses (Huang 2020). Huang (2020) found differences in imagistic elaboration and ad attitude for metaphors varying in perceived artful deviation. We accounted for artful deviation by checking whether the replacement ads were indeed perceived as artfully deviant and whether there were any differences in perceived artful deviation between the three replacement types.

Method

Participants

A total of 83 Dutch students took part in the experiment (53 women and 30 men).[1] The mean age was 22.30 years (SD = 3.82). All participants were naïve with respect to the purpose of the experiment.

Design

The experiment had a within-subjects design with replacement type (i.e. source without target context, source in target context, target in source context) as factor. Replacement type was a within-subjects factor because the salience of a fluency experience is increased when there is a discrepancy between feelings of ease of processing versus difficulty of processing (Unkelbach and Greifeneder 2013, 258). The dependent variables were perceived processing fluency and aesthetic pleasure. Metaphor comprehension was included as well to investigate how it affects the perceived processing fluency and aesthetic pleasure of the three different replacement types.

Material

Ten sets of replacement ads were created. Each set contained three replacement ads for the same product: one source without target context ad, one source in target context ad, and one target in source context ad. Figure 1 shows the replacement ads for Profluo toothpaste, one of the ten ad sets included in the study. The ads contained a product category and fictitious brand name as verbal anchors, which were placed in the upper right corner. The ads did not contain headlines. Examples of the advertised products included deodorant, sport shoes, and condoms. A description of all replacement ads can be found in Table 1. Five lists were created to vary the order

Table 1. Description of the ad stimuli.

Product	Fictitious brand	Replacement type	Description
Condom	Sadex condoms	Source without target context	Lifebuoy
		Source in target context	Woman kissing a man and holding a small lifebuoy in her hand
		Target in source context	Large condom on the railing of a ship
Detergent	Laundrit detergent	Source without target context	Perfume
		Source in target context	Bottle of perfume on a washing machine
		Target in source context	Woman spraying detergent on her wrist
Deodorant	Ode deodorant	Source without target context	Shower head
		Source in target context	Woman holding a shower head near her armpit
		Target in source context	Shower cabin with deodorant as a shower head
Duster	Swifty dusters	Source without target context	Magnet
		Source in target context	Person cleaning a table with a large magnet
		Target in source context	Duster attracting nails
Energy bar	Bakerist energy bar	Source without target context	Battery
		Source in target context	Woman eating a battery
		Target in source context	Battery pack with energy bars
Mattress	Comfisleep mattresses	Source without target context	Clouds
		Source in target context	Bed with a cloud as mattress
		Target in source context	Dune scenery with mattresses floating in the blue sky
Sport shoes	Runsneakerz sport shoes	Source without target context	Race car
		Source in target context	Man running with race cars as shoes
		Target in source context	Sport shoe on a racetrack
Suitcase	Travelsuit suitcases	Source without target context	Closet
		Source in target context	Closet on a baggage carousel
		Target in source context	Large suitcase in a bedroom
Toilet freshener	Purescent toilet freshener	Source without target context	Bouquet of roses
		Source in target context	Roses in a toilet
		Target in source context	Vvase with toilet fresheners in it
Toothpaste	Profluo toothpaste	Source without target context	Diamond
		Source in target context	Diamond on a toothbrush
		Target in source context	Tube of toothpaste on a ring

of the ads as well as the combinations of product category and replacement type. For instance, list 1 contained the source in target context ad of the sport shoes whereas list 3 contained the target in source context ad of the sport shoes. Each participant saw just one ad per ad set.

Pre-test

A pre-test was conducted to check whether the three replacement types in each set differed in artful deviation and complexity. Moreover, the pre-test was used to select the ten sets of replacement ads that were equal in terms of conventionality and comparability, and were equally difficult to comprehend. A total of 58 participants took part in the pre-test (41 women; 17 men). The mean age was 21.90 years (SD = 3.29). Most participants (93.1%) were highly educated.

Nineteen sets of replacement ads were randomly shown in three different online surveys. Each participant saw a total of either six or seven replacement sets. Participants first saw one set of three replacement ads, presented side-by-side, for the same product. Participants evaluated each ad on artful deviation on three 7-point semantic differential scales based on McQuarrie and Mick (1996) (i.e. The advertising image is: familiar-innovative, predictable-surprising, straightforward-creative). Participants also evaluated each ad on

complexity using a 7-point semantic differential scale (i.e. The advertising image is: easy-difficult to understand). Next, participants were asked for their perceived and actual comprehension of the whole replacement set. Perceived comprehension was tested by asking participants to what extent they felt like they understood the ads on a 5-point Likert scale. Actual comprehension was measured through an open question asking participants to formulate the meaning of the ads in the set in their own words.

Subsequently, participants evaluated the conventionality of the target-source combination using three 7-point semantic differential scales based on Bowdle and Gentner (2005) (i.e. The comparison between the two concepts is: unusual – usual, old – novel, not self-evident, self-evident). Comparability between the source and target was measured using three 7-point semantic differential scales based on Gkiouzepas and Hogg (2011) (i.e. The two objects are: similar – unsimilar, related – unrelated, different – not different). The survey ended with questions on demographics.

A repeated measures ANOVA showed a main effect of replacement type on artful deviation, (F(2,114)=187.30, $p<$ .001, η2 = .767). Pairwise comparisons using Bonferroni correction revealed that target in source context ads (e.g. the ad with the toothpaste tube on a ring; $M=5.02$, SD=.84) were perceived as more artfully deviant than source in target context ads (e.g. ad with a diamond on a toothbrush; $M=4.76$, SD=.87) ($p<$ .05) and source without target context ads (e.g. the ad with the diamond; $M=2.36$, SD = 1.11) ($p<.001$). Source in target context ads were perceived as more artfully deviant than source without target context ads ($p < .001$).[2]

A second repeated measures ANOVA showed a main effect of replacement type on perceived complexity, (F(2,114)=11.86, $p < .001$, η2 = .172). Pairwise comparisons using Bonferroni correction revealed that source without target context ads ($M=4.77$, SD = 1.53) were more difficult to understand than source in target context ads ($M=3.81$, SD = 1.05, $p<$ .001). The difference between source without target context ads and target in source context ads ($M=4. 21$, SD = 1.12) was marginally significant ($p = .06$). Furthermore, the target in source context ads were perceived as more difficult to understand than the source in target context ads ($p = .005$).

Of the nineteen ad sets presented to participants, we selected the ten sets which scored most consistently on conventionality, comparability and artful deviation, and highest on perceived and actual comprehension. An overview of the means and SDs for the selected ad sets can be found in Appendix A. Lastly, small alterations to the images were made based on the feedback from the participants.

Procedure and instrumentation

The experiment was built in EPrime (Schneider, Eschmann, and Zuccolotto 2002) and ran partially in the lab of the Tilburg Institute for Cognition and Communication and partially in quiet rooms at Tilburg University. Participants were seated behind laptops and were successively presented with 20 ads (6 experimental ads (i.e. 2 per replacement type), and 14 filler ads, which were straightforward ads, ads with celebrity endorsements and ads with the metaphor types fusion and juxtaposition, see Note 1).

Each experimental trial consisted of the sequence shown in Figure 2. First, participants saw a fixation cross for 1000 ms. The fixation cross was followed by a delay of 80 ms after which the stimulus was presented for a duration of 5000 ms.[3] After the stimulus, a delay was presented of 80 ms immediately followed by a 200 ms visual

noise mask. Subsequently, participants evaluated the ad on aesthetic pleasure (i.e. 'The advertising image is: ugly/beautiful, unattractive/attractive, unpleasing to see, not nice/nice to see, not enjoyable/enjoyable to see', α = .94) (Blijlevens et al. 2017) and perceived processing fluency (i.e. 'I find the advertising image difficult/easy to understand' and 'I find the advertising image difficult/easy to recognize', α = .75) (Jakesch, Leder, and Forster, Leder, and Ansorge 2013; van Enschot and van Mulken 2014) on 7-point semantic differentials. Furthermore, comprehension of the advertisements was measured with two open questions: 'For which product was this advertisement?' (i.e. product recognition) and 'Explain shortly in your own words what the advertisement was trying to convey about the product' (i.e. metaphor comprehension, cf. Phillips 1997). Finally, the participants answered four demographic questions (i.e. gender, age, nationality, and highest completed education level).

Data analysis

Data were analyzed using the statistical program R version 4.1.2 (R Core Team 2014) and lme4 version 1.1-27.1 (Bates, Maechler, and Bolker 2012) to perform mixed model analyses on the relation between replacement type, perceived processing pleasure and aesthetic pleasure. We entered replacement type as a fixed effect and participants and advertisements as random effects into the models. For all models, we used a variance components covariance structure and restricted maximum likelihood estimation. The analyses were based on 498 observations in total.

Information criteria were calculated for an empty model with only the random factors (i.e. participants and ads) and a complete model with the random factors and replacement type as a fixed factor. Table 2 presents the information criteria for these two models with
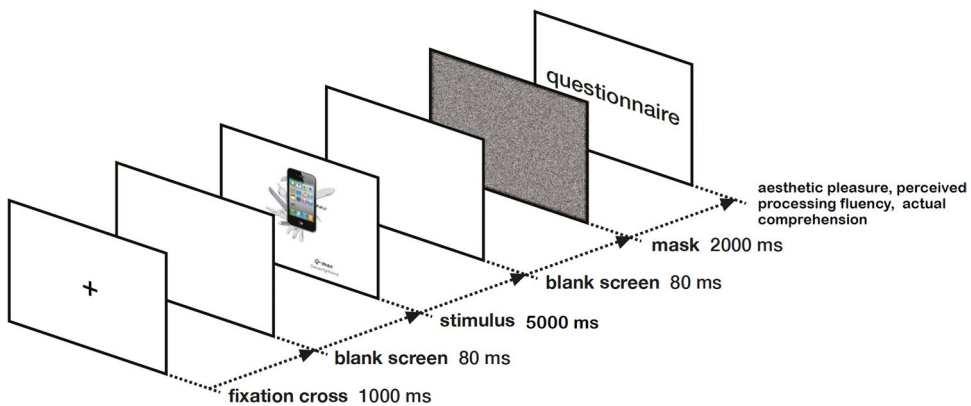
Figure 2. Experimental trial.

Table 2. Information criteria (−2 log likelihood) and degrees of freedom (df) for mixed-model analyses.

	Null model with only random factors (df)	Model with random and fixed factors (df)	χ^2 test Null model vs. Model with random and fixed factors
Perceived processing fluency	−984.20 (4)	−953.65 (6)	$\chi^2(2) = 61.097$, $p < .001$
Aesthetic pleasure	−834.69 (4)	−829.50 (6)	$\chi^2(2) = 10.375$, $p = .006$

χ2 tests to test whether the decrease of the information criteria was significant. Both for aesthetic pleasure and perceived processing fluency, the information criteria decreased significantly comparing the model with only random factors to the complete model.

For comprehension, the answers to the open questions for product recognition and metaphor comprehension were manually coded as either correct (1) or incorrect (0) by two coders. Any discrepancies were solved by a third coder. The correct answer to the question for product recognition had to contain the target object. For example, the correct answer for the advertisements shown in Figure 1 was 'toothpaste'. Correct answers to the question for metaphor comprehension linked the target to the (attributes of the) source. Examples of correct answers for the advertisements in Figure 1 were: 'When you brush your teeth with this toothpaste, your teeth will shine like a diamond', 'Your teeth shine like a diamond', and 'This toothpaste makes your teeth white and shiny'. An example of an incorrect answer was: 'This toothpaste is tasty'.

Results

Perceived processing fluency

Figure 3 shows the means and standard deviations for aesthetic pleasure and perceived processing fluency as a function of replacement type.

Hypothesis 1 stated that source without target context ads are perceived as less fluent to process than target in source context ads, which are perceived as less fluent to process than source in target context ads. Table 3 shows the results for
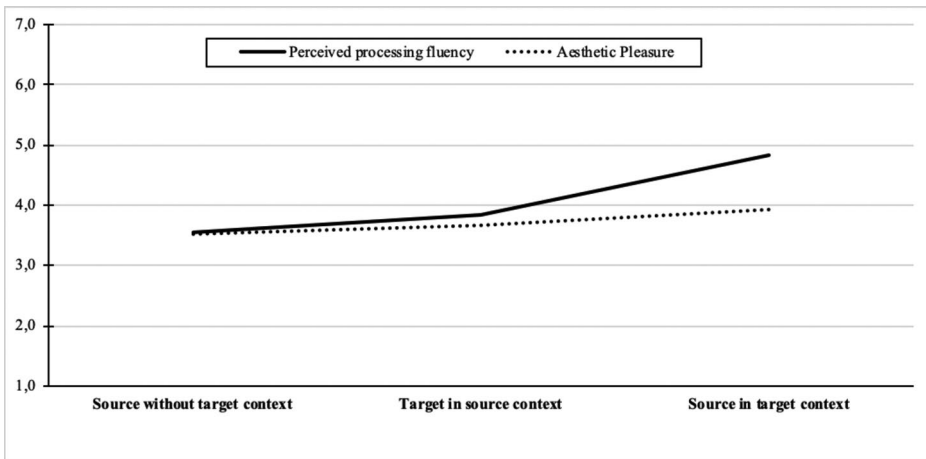
Figure 3. Means for perceived processing fluency and aesthetic pleasure as a function of replacement type.

Table 3. Statistical model for perceived processing fluency with source without target context as reference category (Intercept).

Fixed effects	b	LLCI	ULCI	p
Intercept	3.56	3.11	4.00	<.001
Source in target context	1.27	0.95	1.59	<.001
Target in source context	0.30	−0.03	0.62	.07

perceived processing fluency with the source without target context ads (e.g. the ad with the diamond) as reference category. The effect estimates, displayed below the intercept, present the estimation of the change in perceived processing fluency for the mentioned replacement type as compared to the reference category. The source without target context ads were perceived as less fluent to process than the source in target context ads (e.g. the ad with a diamond on a toothbrush; $b = 1.27$, $p < .001$), consistent with Hypothesis 1. However, only a marginally significant difference was found in perceived processing fluency between source without target context ads and target in source context ads (e.g. the ad with a tube of toothpaste on a ring; $b = 0.30$, $p = .07$), which is inconsistent with Hypothesis 1. Table 4 shows the results of a rerun of the model with target in source context ads as reference category. Ads with this replacement type were perceived as less fluent to process than source in target context ads ($b = 0.97$, $p < .001$), which is consistent with Hypothesis 1.

Aesthetic pleasure

Hypothesis 2 posited that source without target context ads are perceived as less aesthetically pleasing than target in source context ads, which are perceived as less aesthetically pleasing than source in target context ads. Table 5 shows that source without target context ads (e.g. the ad with the diamond) indeed yielded less aesthetic pleasure than source in target context ads (e.g. ad with a diamond on a toothbrush; $b = 0.40$, $p = .001$). However, there was no difference in aesthetic pleasure between source without target context ads and target in source context ads (e.g. the ad with the toothpaste tube on a ring; $b = 0.15$, $p = .247$). Table 6 shows a rerun of the model, with target in source context ads as reference category. The target in

Table 4. Statistical model for perceived processing fluency with target in source context as reference category (Intercept).

Fixed effects	b	LLCI	ULCI	p
Intercept	3.85	3.41	4.29	< .001
Source without target context	−0.30	−0.62	0.03	.07
Source in target context	0.97	0.65	1.29	< .001

Table 5. Statistical model for aesthetic pleasure with source without target context as reference category (Intercept).

Fixed effects	b	LLCI	ULCI	p
Intercept	3.52	3.25	3.78	< .001
Source in target context	0.40	0.16	0.65	.001
Target in source context	0.15	−0.10	0.39	.247

Table 6. Statistical model for aesthetic pleasure with target in source context as reference category (Intercept).

Fixed effects	b	LLCI	ULCI	p
Intercept	3.66	3.40	3.93	< .001
Source without target context	−0.15	−0.39	0.10	.247
Source in target context	0.26	0.01	0.50	.042

source context ads yielded less aesthetic pleasure than source in target context ads (*b* = 0.26, *p* = .042), consistent with Hypothesis 2.

Comprehension

The comprehension scores are shown in Table 7, subdivided into product recognition and metaphor comprehension. Comprehension scores were high for the source in target context ads (e.g. ad with a diamond on a toothbrush; product recognition: 85.5%, metaphor comprehension: 84.9%), and somewhat lower but still over 70% for the source without target context ads (e.g. the ad with the diamond; product recognition: 76.5%, metaphor comprehension: 72.3%). For the target in source context ads (e.g. the ad with the toothpaste tube on a ring), product recognition was high (89.8) but metaphor comprehension was substantially lower (57.8%).

Effects of metaphor comprehension

Additionally, we tested whether metaphor comprehension influenced the effect of replacement type on perceived processing fluency and aesthetic pleasure respectively. In Table 8, the means and standard deviations are shown as a function of replacement type and metaphor comprehension. Table 9 shows the results of the analysis for perceived processing fluency where the effect of metaphor comprehension is allowed to vary between replacement types. In this analysis, uncomprehended target in source context ads are used as a reference category. The first three effect estimates present the estimation of the change in perceived processing fluency for either metaphor comprehension or the mentioned replacement type as compared to the reference category. The last two lines show the additional effect on the outcome if both metaphor comprehension or replacement type deviate from their reference values simultaneously.

Table 7. Product recognition and metaphor comprehension (% correct, over participants and stimuli) as a function of replacement type.

	Source without target context	Target in source context	Source in target context
Product recognition	76.5	89.8	85.5
Metaphor comprehension	72.3	57.8	84.9

Table 8. Means and standard deviations (between parentheses) for perceived processing fluency and aesthetic pleasure as a function of replacement type and metaphor comprehension ('-' = not comprehended, '+' = comprehended).

	Source without target context		Target in source context		Source in target context		Total	
Comprehension	−	+	−	+	−	+	−	+
Perceived processing fluency	3.39	3.62	3.47	4.13	3.24	5.10	3.40	4.34
	(1.91)	(1.78)	(1.83)	(1.64)	(2.00)	(1.49)	(1.88)	(1.75)
Aesthetic pleasure	3.51	3.52	3.66	3.67	3.54	3.99	3.59	3.75
	(1.33)	(1.34)	(1.35)	(1.34)	(1.22)	(1.48)	(1.31)	(1.40)

Note. Perceived processing fluency and aesthetic pleasure were measured on a 7-point scale, with higher scores indicating higher processing fluency and aesthetic pleasure.

Table 9 shows that perceived processing fluency is higher for comprehended than for uncomprehended target in source context ads ($b = 0.51$, $p = .038$). This effect of comprehension is enlarged considerably if the comprehension relates to the source in target context ads (extra $b = 1.05$, $p = .013$). However, in case of comprehension related to the source without target context ads, the perceived processing fluency is lower than in case of the target in source context ads (extra $b = -0.73$, $p = .055$). Table 10 shows the results for aesthetic pleasure with the uncomprehended target in source context ads as reference category. Metaphor comprehension does not have an effect at all.

Tables 11 and 12 show the results for comprehended metaphors only. Table 11 shows the results for perceived processing fluency with the source without target context ads (e.g. the ad with the diamond) as reference category. The source without target context ads were perceived as less fluent to process than the source in target context ads (e.g. the ad with a diamond on a toothbrush; $b = 1.58$, $p < .001$),

Table 9. Statistical model for perceived processing fluency with target in source context ads and uncomprehended metaphors as reference category (Intercept).

Fixed effects	b	LLCI	ULCI	p
Intercept	3.55	3.07	4.05	< .001
Metaphor comprehension	0.51	0.03	1.00	.038
Source without target context	0.16	−0.43	0.73	.609
Source in target context	−0.06	−0.79	0.65	.847
Metaphor comprehension * Source without target context	−0.73	−1.45	0.02	.055
Metaphor comprehension * Source in target context	1.05	0.23	1.89	.013

Table 10. Statistical model for aesthetic pleasure with target in source context ads and uncomprehended metaphors as reference category (Intercept).

Fixed effects	b	LLCI	ULCI	p
Intercept	3.68	3.33	4.02	< .001
Metaphor comprehension	−0.02	−0.40	0.36	.921
Source without target context	−0.21	−0.67	0.24	.359
Source in target context	−0.08	−0.64	0.48	.777
Metaphor comprehension * Source without target context	0.10	−0.48	0.67	.742
Metaphor comprehension * Target in source context	0.40	−0.25	1.06	.224

Table 11. Statistical model for perceived processing fluency with source without target context ads as reference category (Intercept) | Comprehended metaphors only.

Fixed effects	b	LLCI	ULCI	p
Intercept	3.51	3.11	3.91	<.001
Source in target context	1.58	1.23	1.92	<.001
Target in source context	0.61	0.22	1.00	.002

Table 12. Statistical model for perceived processing fluency with target in source context as reference category (Intercept) | Comprehended metaphors only.

Fixed effects	b	LLCI	ULCI	p
Intercept	4.13	3.71	4.54	< .001
Source without target context	−0.61	−1.00	−0.22	.002
Source in target context	0.97	0.60	1.34	< .001

consistent with Hypothesis 1 and the main analyses. As opposed to the main analyses, but consistent with Hypothesis 1, the source without target context ads were perceived as less fluent to process than the target in source context ads (e.g. the ad with a tube of toothpaste on a ring; $b=0.61$, $p = .002$). Table 12 shows the results of a rerun of the model with target in source context ads as reference category. Ads with this replacement type were perceived as less fluent to process than source without target context ads ($b=0.97$, $p < .001$), which is consistent with Hypothesis 1 and the main analyses.

Discussion and conclusion

In this study, we focused on Phillips and McQuarrie's replacement category for presenting visual metaphors. In a replacement, only the target object or the source object is shown; the other is absent. Empirical studies operationalize replacements in different ways. Some ads show the source object on a neutral background whereas other ads show the source or target object in the context of the absent element (e.g. van Mulken, van Hooft, and Nederstigt 2014). Arguably, these different operationalizations make it impossible to determine the exact cause of the cognitive and affective responses found thus far. Different replacement types may yield different responses, which might put the assumed responses for juxtapositions, fusions and replacements to the test.

We have argued that there are disparate replacement types differing in audience responses: 1) source without target context, 2) target in source context, and 3) source in target context. We validated this refinement through an experiment testing the effects of the three replacement types on perceived processing fluency and aesthetic pleasure. Metaphor comprehension was taken into account as well as it could influence the effects of replacement types on perceived processing fluency and aesthetic pleasure. In the experiment, only metaphors were included that were equal in terms of comparability and conventionality.

For perceived processing fluency, we expected that source without target context ads would be perceived as less fluent to process than target in source context ads, which would be perceived as less fluent to process than source in target context ads (H1). The results of the main analysis (including both comprehended and uncomprehended ads) partially confirmed H1. The source without target context ads were perceived as less fluent to process than the source in target context ads (e.g. the ad with a diamond on a toothbrush). However, no difference was found in perceived processing fluency between source without target context ads and target in source context ads (e.g. the ad with a tube of toothpaste on a ring). An explanation for this result could be that the metaphors in target in source context ads were relatively often not comprehended (over 40%). A re-analysis with just the comprehended metaphors did produce support for H1: the source without target context ads were perceived as less fluent to process compared to target in source context ads.

For aesthetic pleasure, we expected that source without target context ads would be perceived as less aesthetically pleasing than target in source context ads, which would be less aesthetically pleasing than source in target context ads (H2). The results partially confirmed H2: both source without target context and target in

source context ads yielded less aesthetic pleasure than source in target context ads. However, aesthetic pleasure was equally high for source without target context ads and target in source context ads. Moreover, metaphor comprehension did not affect this pattern.

For both perceived processing fluency and aesthetic pleasure, we expected diverging results for source without target context and target in source context ads based on their difference in visual anchoring. However, these diverging results were only found for the perceived processing fluency of comprehended metaphors. The context in the target in source context ads (e.g. the ad with a tube of toothpaste on a ring) seemed to anchor less than expected. It may well have served as an anchor by hinting at the presence of a metaphor (Alousque 2015), but not at the meaning of this metaphor (e.g. TOOTHPASTE IS DIAMOND/FUNKY OBJECT). It may be too open (semantically unstable, ambiguous; Berlyne 1971; Ketelaar and van Gisbergen 2006; Muth and Carbon 2016) to guide viewers towards the correct interpretation. This assumption is supported by the differences in the comprehension scores, subdivided into product recognition and metaphor comprehension. Almost everyone recognized the product in the target in source context ads (e.g. the toothpaste), while around 1 in 2 participants actually understood the metaphor, which is substantially less than for the source in target context and source without target context ads. This struggle for interpreting the target in source context is also reflected in the perceived processing fluency scores, which were quite low and remained low when taking just the comprehended metaphors into account. An explanation for the lack of difference between the source without target ads and target in source context ads in aesthetic pleasure could be that the pleasure derived from processing the incongruity in target in source context ads may have been suppressed by the difficulty of interpreting this semantically unstable, open metaphor type. Another explanation could be that the exposure time of 5000 ms may be more than participants needed to arrive at an understanding, with aesthetic pleasure wearing off. This is in line with findings on the Aha moment. An experiment by Muth and Carbon (2013) demonstrated that liking was highest right after the Aha moment but dropped substantially after that.

Limitations and suggestions for future research

A limitation of this study might have been the difference in visual complexity (i.e. number of visual elements and pixels in the ad) between the replacement types (Pieters, Wedel, and Batra 2010). Replacement ads without context were relatively less visually complex compared to replacement ads with context. Source without target context ads may have received their perceived processing fluency scores partially because of their relatively low visual complexity. In a follow-up experiment, we suggest to situate the source object in its own context (e.g. diamond on a ring), and control for the number of visual elements and pixels in the ads (van Geert and Wagemans 2020).

Previous research showed that replacement ads are often appreciated less than fusion ads, potentially because of the use of replacements without context (e.g. Chang et al. 2018; Madupu, Sen, and Ranganathan 2013; Ryoo, Jeon, and Sung 2020; van Mulken, van Hooft, and Nederstigt 2014). The findings of this study show that the

source in target context ads outperformed the other two replacement types. Source in target context ads provide a clear hint at the ad's interpretation (e.g. TOOTHPASTE IS DIAMOND). This may well have led to the highest perceived processing fluency and, with that, the highest aesthetic pleasure. Our forthcoming study will include Phillips and McQuarrie (2004) juxtapositions, fusions and replacements to find out how source in target context ads (e.g. the ad with a diamond on a toothbrush) as well as target in source context ads (e.g. the ad with a tube of toothpaste on a ring) compare with fusion and juxtaposition ads. This comparison would allow us to put Phillips and McQuarrie (2004) assumption of increasing processing demands to test. Furthermore, it would shed light on the tipping point of the inverted U-curve where increasing processing demands go from yielding higher affective responses to lower affective responses (van Mulken, van Hooft, and Nederstigt 2014; Mohanty and Ratneshwar 2016; Phillips 2000, Ryoo, Jeon, and Sung 2020). Another line of future research would be to not just focus on the meaning operation similarity ('A is like B'), as we did in the current study, but compare this with Phillips and McQuarrie (2004) other two meaning operations, i.e. connection ('A is associated with B') and opposition ('A is not like B').

In this study, we investigated the effects of different replacement types on aesthetic pleasure. Researchers (Sopory and Dillard 2002; van Mulken, Le Pair, and Forceville 2010; van Mulken, van Hooft, and Nederstigt 2014; van Stee 2018) stress the importance of including attitude towards the ad and attitude towards the brand when studying visual metaphor. Aesthetic pleasure has been shown to mediate the effect of visual metaphors on attitude towards the ad and attitude towards the brand (Mohanty and Ratneshwar 2016; Margariti et al. 2021). It would be valuable to replicate our findings in an experiment in which these standard outcome measures are added.

Theoretical implications

Although previous research examined the effects of visual metaphor structure, this is the first study to propose and validate differential replacement types. Huang (2020) built a similar case for juxtapositions and argued that the concept of visual structure in Phillips and McQuarrie's framework needs to be revisited. In the current study, we differentiated between replacement types by taking context into account (i.e. visual anchoring; Gkiouzepas and Hogg 2011; van Enschot and Hoeken 2015) and found that presence as well as type of context in replacement ads affects perceived processing fluency and aesthetic pleasure. When investigating visual metaphor structure, we should therefore not only focus on how the target object and the source object are presented but also whether pictorial context is present and – if so – how this context hints at the meaning of the metaphor. Furthermore, we need to reassess the empirical work comparing Phillips and McQuarrie (2004) three visual structures juxtapositions, fusion and replacement. Question is whether Phillips and McQuarrie (2004) assumption of increasing processing demands (juxtaposition < fusion < replacement) holds for replacements which clearly hint at the absent element (i.e. source in target context; diamond on toothbrush) and whether the affective responses to this type of replacement are indeed lower than to fusions (van Mulken, van Hooft, and Nederstigt 2014).

Managerial implications

Advertisers who employ visual metaphors (e.g. TOOTHPASTE IS DIAMOND) should consider subtle differences among various metaphor structures, even when they communicate the same metaphorical meaning. In practice, fusion metaphors (in which, e.g. the toothpaste is merged with the diamond) are used more often than juxtapositions and replacements (Margariti et al. 2021). The results of the current study show that replacements should also be taken into consideration. Replacement metaphors with context – especially target context to a source object (e.g. diamond on a toothbrush) – are relatively easy process, pleasurable, and hence a good candidate for advertising campaigns.

Notes

1. The data reported in this paper were obtained in a larger experiment, which included an additional between-subjects condition in which participants were exposed to each ad either for 100ms or 5000ms. The short exposure time condition is left out of this article as its results are hard to interpret due to the fact that most participants failed to recognize the metaphors. In addition, this larger experiment exposed participants not only to the three replacement types but to the other two metaphor structures as well: fusion and juxtaposition. As our aim for this article was to shed light on the differentiation within the replacement category, we decided to treat the fusion and juxtaposition ads as fillers. The results comparing the two exposure times and the five different metaphor types can be obtained from the first author. Our forthcoming article will focus on the comparison between juxtaposition, fusion and replacement.
2. The relatively low score on artful deviation for the source without target context ads may well be caused by the fact that just metaphors were shown, which are all by definition artfully deviant (Phillips and McQuarrie 2004).
3. We have chosen an exposure time of 5000ms consistent with Jakesch, Leder, and Forster's (2013) study on ambiguous paintings. Moreover, research by Lagerwerf, van Hooijdonk, and Korenberg (2012) showed that participants needed 2000ms to 3500ms to process juxtapositions and fusions ads with meaning operation similarity. As processing demands increase from juxtapositions to fusions to replacements (Phillips and McQuarrie 2004), we decided to provide participants with ample time to process the replacement ads.

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Data availability statement

The data that support the findings of this study are openly available on the Open Science Framework (OSF) at https://osf.io/uvnwh/.

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Appendix A

Stimulus	Conventionality M (SD)	Comparability M (SD)	Perceived com- prehension M (SD)	Actual comprehension
Condom	3.56 (1.56)	4.07 (1.49)	3.89 (1.20)	79% correct
Detergent	5.41 (1.53)	4.25 (1.21)	4.16 (0.77)	89% correct
Deodorant	4.77 (1.56)	5.14 (.90)	3.74 (0.99)	84% correct
Duster	5.35 (1.67)	4.08 (1.60)	4.10 (1.02)	90% correct
Energy bar	5.47 (1.24)	4.44 (1.39)	4.53 (0.61)	79% correct
Mattress	5.56 (1.30)	3.95 (1.60)	4.21 (0.79)	84% correct
Sports shoes	4.48 (1.61)	3.73 (1.45)	4.50 (0.69)	85% correct
Suitcase	4.09 (1.63)	4.28 (1.43)	3.79 (1.13)	89% correct
Toilet freshener	5.88 (1.26)	4.12 (1.47)	4.37 (0.60)	89% correct
Toothpaste	4.78 (1.56)	3.02 (1.58)	4.15 (1.04)	90% correct