Adding Context to Metaphors

Research into the influence of exposure time on felt fluency, processing pleasure, and aesthetic pleasure of different metaphor structures with and without context

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Abstract

The goal of this study was to investigate to what extent advertisements with visual metaphors give viewers aesthetic pleasure. In addition, this study aimed to find out whether and how felt fluency and processing pleasure mediate the effect of metaphor structure on aesthetic pleasure. This was investigated through an experiment in which participants were shown multiple advertisements with visual metaphors in five different structures: Juxtaposition, Fusion, Replacement, Target Replacement, and Context Replacement. The five structures differed in means of creative complexity and the absence/presence of context. Images were shown either 100ms or 5000ms in order to manipulate processing mechanisms (automatic versus controlled processing). After each image, participants were asked to answer a set of questions to measure aesthetic pleasure, felt fluency, comprehension, and processing pleasure. Results indicated that participants get most aesthetic pleasure from advertisements that are not too difficult to comprehend; images that are pleasurable to process and are in the end understandable, are appreciated best. The results hint at a mediating relationship between felt fluency, processing pleasure, and aesthetic pleasure, but more research is needed to confirm the actual presence of mediation.

Keywords: advertisements, visual metaphor, context, processing mechanisms, felt fluency, processing pleasure, aesthetic pleasure.

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Introduction

Advertisements can be found in many different forms with varying degrees of creative complexity. All, however, share one ultimate goal: to persuade potential customers of the benefits of the portrayed product or service. This can for instance be done by generating aesthetic pleasure. The current study aimed to shine a light on the aesthetic pleasure generated by advertisements with varying degrees of creative complexity.

There are many factors that determine why people experience aesthetic pleasure. Palmer, Schloss, and Sammartino (2013) studied this within the visual domain. They state that although people make decisions about aesthetics mostly unconsciously, appeal might relate to cognitive factors (Palmer et al., 2013). Graf and Landwehr (2015) introduced a model to increase knowledge on this; the PIA Model (Pleasure-Interest Model of Aesthetic Liking). This model indicates that cognitive processing indeed plays a role; Graf and Landwehr (2015) hypothesize that processing can happen either in a controlled or automatic manner, resulting in different evaluations of aesthetic pleasure and interest towards the object.

Relating this to the area of advertisements, quite some research has been done already. Since a corpus analysis executed by Phillips and McQuarrie (2002) within the area of advertisement showed that visual metaphors appeared more frequently over the years, this study will focus on the aesthetic pleasure gained from advertisements including visual metaphors varying in creative complexity. A metaphor is best described as the way in which human beings conceptualize one mental domain in terms of another (Lakoff, 1993). A reason for using metaphors instead of literal language or visuals in advertisements is that ‘advertisers hope to give their audience a pleasurable experience’ (Van Mulken, Van Hooft, & Nederstigt, 2015, p. 333). According to Phillips (1997), viewers feel flattered when they have the relevant knowledge to solve the ‘problem’ presented in the advertisement, resulting in positive affect towards the product. Theories elaborating on whether this experience is most pleasurable for either simple or more complex visuals, are somewhat contradicting.

According to Berlyne (1971), the more complex a stimulus is the more arousal potential it has, which eventually leads to positive affect. However, when a stimulus is very complex, there is also the possibility of too much arousal potential leading to negative affect and a less pleasurable experience. Hekkert, Snelders, and Van Wieringen (2003) proposed a theory similar to Berlyne's views which they call the MAYA principle; Most Advanced Yet Acceptable. They state a balance is needed between novelty and typicality in order to reach aesthetic pleasure. In addition, the Optimal Innovation Hypothesis as proposed by Giora, Fein, Idit, Noa, and Zur (2004) supports this idea, since this theory states that a visual which perfectly mixes what is known (salient) and what is new (novel) leads to most aesthetic pleasure. In contrast, the Fluency Theory by Reber, Schwarz, and Winkielman (2004) states that people prefer what is most easy to process rather than a balance between low and high complexity, since people associate high felt fluency with successful comprehension which leads to positive affect.

A possible explanation for the contrasting theories might lay within the way humans process creative complex visuals. For instance whether processing happens in a controlled or automatic manner as proposed in the PIA Model (Graf & Landwehr, 2015). How humans process incoming information might depend on the available processing time (Hekkert et al., 2003). It would be expected that short exposure times lead to automatic processing, resulting in a preference towards that what is most easy to process. Long exposure times are expected to allow for controlled processing and a preference towards more complex visuals.

The effects of exposure time on aesthetic pleasure to visuals varying in creative complexity have been studied before to some extent. A study by Van Enschot and Van Mulken (2014) showed that regardless of exposure time, complex visuals received higher ratings in means of aesthetic pleasure than less complex visuals. A possible explanation for this might be that the visuals were never too complex to lead to the negative affect Berlyne (1971) discusses.

In a study by Van Enschot and Van Hooijdonk (2016), participants often preferred the most complex visuals as well (in this case metaphorical replacements in advertisements), especially when short exposures times were applied. The principle of felt fluency might explain this; the images felt easy to process for viewers leading to high scores on aesthetic pleasure as predicted by the Fluency Theory (Reber et al., 2004). However, follow-up questions showed that these complex images were often misunderstood. Participants were unaware of the presence of a metaphor and missed out on the product which was being advertised.

Adding context to metaphorical replacements could help people understand that the product that is portrayed actually refers to another product, since context could serve as a form of visual anchoring hinting at the presence of metaphorical meaning. This adding of context might possibly increase not only ratings on comprehension, but also on felt fluency, processing pleasure, and ultimately aesthetic pleasure towards the images. Some questions arise from this, for example whether the addition of context to visual metaphors makes the advertisements more understandable and enjoyable to process, and whether this eventually leads to more aesthetic pleasure. This leads to the following research questions addressed in this paper:

What is the influence of exposure time on aesthetic pleasure of visual metaphors in advertisements with varying degrees of creative complexity, with or without context?

To what extent do felt fluency and processing pleasure mediate these effects on aesthetic pleasure?

In the following chapter, the theoretical framework of this study will be introduced, with theories on how to categorize visual metaphors based on their creative complexity, how context can be added to metaphors, how complex visuals get processed by humans, and how this is related to aesthetic pleasure, felt fluency and processing pleasure.

Theoretical framework

In order to be able to answer the research questions, it is necessary to investigate different taxonomies and structures used to categorize metaphors. In this paper, two different taxonomies by Phillips and McQuarrie (2004) and Forceville (2008) will be elaborated on.

Metaphor taxonomies and structures – Phillips and McQuarrie (2004)

In their article *Beyond visual metaphor: A new typology of visual rhetoric in advertising,* Phillips and McQuarrie (2004) propose a typology to distinguish different metaphor structures based on complexity and ambiguity of the visual structure. Meaning operation lies at the basis of their typology as well. With meaning operation, the establishment of the link between target domain (advertised product) and source domain (figurative object related to the topic in some way) is meant. Cognitive processing is needed to find the link and to be able to map the correct attributes of the source domain to the target domain. According to Phillips and McQuarrie (2004), there are three sorts of meaning operation: connection, comparison for similarity, and comparison for opposition between target and source domain. Within this paper, meaning operation will be held constant. Only metaphors with the meaning operation comparison for similarity will be discussed. With visual structure, the placement of the object(s) in a graphic is meant. There are three visual structures according to Phillips and McQuarrie (2004) which will be used throughout this paper; Juxtaposition, Fusion, and Replacement.

Juxtaposition. Since the goal of a visual with metaphorical meaning is to communicate two elements at once, the easiest way to do this is by simply juxtaposing two objects side by side. If an advertiser for instance wants to advertise a car and wants to highlight its robustness, the car can be shown alongside a hippo, like in Figure 1. The two objects are portrayed side by side, and it is up to the viewer to attribute the characteristics of the hippo to the car. This is a form of Juxtaposition with similarity as meaning operation; the car and the hippo have some shared characteristics which are highlighted through showing them next to each other.

Figure 1. Juxtaposition with comparison for similarity.

Figure 2. Fusion with comparison for similarity

Fusion. Another way of portraying two objects at once, is by fusing them together. This is assumed to be already a more complex structure than Juxtaposition, since the viewer sees some kind of hybrid between two objects and needs to figure out the meaning of the hybrid image. The difficulty lies in figuring out what the advertised object is (target domain) and which other object is used to give the advertised product special attributes and highlight its value (source domain). If an advertiser for instance wants to highlight the unique advantage of a certain scourer, namely that it does not leave scratches and can be used on delicate surfaces, the scourer could be fused with a toothbrush, as in Figure 2.

Replacement. The most difficult structure is to have only one object portrayed, which is not the actual advertised product. The object from the source domain replaces the object from the target domain in such a way that the portrayed object calls to mind the absent object. This inference can be hard to make for viewers in some instances. Think for instance of an advertisement for a car only showing a hippo, or an advertisement for a scourer only showing a toothbrush. It would be much harder to understand 1) what the actual advertised product is, and 2) which values from the portrayed object can be attributed to the advertised product. Figure 3 shows an advertisement using a metaphorical Replacement. Text is needed to understand what the guitar (source domain) represents, namely a Nokia phone (target domain) with great sound.

Figure 3. Replacement with comparison for similarity

Metaphor taxonomies and structures – Forceville (2008)

Pictorial metaphors. A categorization within metaphors based on visual complexity which has many similarities with the taxonomy of Phillips and McQuarrie (2004), is the taxonomy proposed by Forceville (2008). Within pictorial metaphors, which are metaphors purely in the visual domain, Forceville (2008) indicates four different structures: Pictorial Simile, Hybrid Metaphor, Integrated Metaphor, and Contextual Metaphor. Within Pictorial Simile, two objects are represented entirely next to each other in such a way that they look similar, just like in Phillips and McQuarrie's (2004) Juxtaposition. In a Hybrid Metaphor, two objects that are normally distinct entities are physically merged into a single new object, meaning it is similar to the Fusion as proposed by Phillips and McQuarrie (2004). The Integrated Metaphor is present when a single object is represented in its entirety in such a manner that it resembles another object without contextual cues, just like the Replacement (Phillips and McQuarrie, 2004). Last, Forceville (2008) elaborates on a form missing in the taxonomy proposed by Phillips and McQuarrie (2004); Contextual Metaphor, in which an object becomes metaphorical because of the visual context in which it is placed.

Context in metaphors

With Forceville's (2008) Contextual Metaphor, the depicted object is the product to be advertised. This object is being placed in the context of the source domain. The context of the source domain is added to the product to highlight unique special features which are shared between target and source. In fact, the addition of context can be seen as a form of visual anchoring in order to transfer meaning. Contexts can be categorized as a form of visual anchoring, since the context provides possible clues to understand the complex metaphorical meaning without explicitly explaining the metaphor.

Studies investigating the processing of different metaphor structures often do not take context into consideration, and leave out the metaphor structure Contextual Metaphor as proposed by Forceville (2008). By for instance looking at the stimuli by Van Mulken et al. (2015), it can be concluded that context in visual metaphor is not operationalized consistently; some Replacements for instance have context surrounding the source domain (e.g. toffee replaced by pearl in a mouth, where the mouth is the context and infers that the pearl represents some precious food), whereas some other Replacements do not show any context but solely the replaced object (e.g., the fan which replaced deodorant and hints at extreme freshness, however no link to deodorant can be found, making it harder to infer the actual meaning proposed by the advertiser). This in combination with Contextual Metaphor as proposed by Forceville (2008) indicates there are actually three sorts of Replacements which can be identified; sole Replacements with no context, Replacements surrounded by context from the target domain, and the actual advertised product surrounded by context from the source domain.

Incongruity Schema Theory as proposed by Schilperoord (in preparation) in the article *Ways with Picture: Visual Incongruities and Metaphor*, indicates a new typology schema which can be used to highlight the different ways in which context can be added in order to create metaphorical meaning for Replacements. This is necessary in order to create a consistent operationalization of the metaphor structure Replacement and to find out whether the addition of context can solve the miscomprehension of Replacements which became apparent in the study by Van Enschot and Van Hooijdonk (2016).

Schilperoord (in preparation) captures the new categories of Replacements with contexts in the so-called two-model incongruity (see Figure 4). In this schema, two Cognitive Models (CM1 and CM2) can be identified. CM1 represents

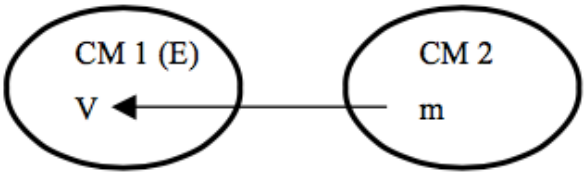

Figure 4. Two-model Incongruity

the context that can be seen in the advertisement (being either context obtained from the target or source domain). The object which seems to be 'misplaced' within the portrayed context is called the Violater (V) which is a model entity (m) lend from the opposing Cognitive Model (CM2) (which can also either represent the target or source domain). In other words, whenever the advertised product is placed within the context of the source domain, CM1 represents the source domain and the advertised product is the Violator. When the context shown in the advertisements portrays the context of the actual advertised product, CM1 represents the target domain and the object which is the Violator comes from the source domain. From now on, Replacements surrounded by context from the target domain will be called Target Replacements, and the actual advertised product surrounded by context from the source domain will be called Context Replacements.

This paper will therefore use the following five metaphor structures, combining the taxonomies by Phillips and McQuarrie (2004), Forceville (2008), and Schilperoord (in preparation): *Juxtaposition*, *Fusion*, *Replacement*, *Target Replacement*, and *Context Replacement*.

The effects of different metaphor structures

The five metaphor structures differ in means of creative complexity and the presence of context. Based on Phillips and McQuarrie (2004), it is assumed Juxtapositions contain least creative complexity, followed by Fusions and Replacements. Little, however, can be said on the perception of creative complexity of Target and Context Replacements. In addition, it is yet unclear what possible effects the different metaphor structures can have on aesthetic pleasure.

Fluency Theory. According to the Fluency Theory by Reber et al. (2004), people in general have a preference towards stimulus which are easiest to process. ''Aesthetic experience is a function of the perceiver's processing dynamics: the more fluently the perceiver can process

an object, the more positive is his or her aesthetic response'' (Reber et al., 2004, p. 365). More specifically, Reber et al. (2004) indicate the importance of conceptual fluency; the felt ease of understanding the stimulus. High conceptual fluency brings positive affect because people associate it with successful comprehension, error-free processing, or having the right knowledge to interpret the stimulus correctly (Reber et al., 2004). Based on this theory, it would be expected that Juxtapositions will lead to most aesthetic pleasure, mediated by felt fluency. However, there are theories contradicting this view.

The inverted U-curve, Optimal Innovation Hypothesis, and MAYA. According to Berlyne (1960), positive versus negative affect after encountering a certain stimulus depends on the novelty, uncertainty, and complexity of the stimulus, and whether it caused conflict between incoming and expected information. These four concepts are so-called collative variables and have arousal potential (Berlyne, 1960). In later work, Berlyne (1971) stated that people generate positive affect whenever arousal potential increases, however people generate negative affect whenever arousal potential increases too much. This indicates an inverted U-curve with a tipping point; stimuli generate more positive affect within people as arousal potential goes up, but shift from generating positive to negative affect after arousal potential has become too distinct. In addition to Berlyne's view, Giora et al. (2004) propose in their article on the Optimal Innovation Hypothesis that people have a preference not for the most easy to understand image or the most difficult one, but for the one that perfectly mixes what is known (salient) and what is new (novel) in a creative and innovative manner. This principle can also be seen in the MAYA principle by Hekkert et al. (2003). Hekkert et al. (2003) state that both typicality and novelty correlate with aesthetic pleasure. However, a typical product is rarely novel, and a novel product is not typical, making the two aspects seem incompatible. Yet, Hekkert et al. (2003) show that people have a preference towards designs that combine that what is known with innovation, making an optimal combination between typicality and novelty.

Dual Processing Theory. A possible explanation for the contradicting theories of Reber at al. (2004) and Berlyne (1971), Giora et al. (2004) and Hekkert et al. (2003) may lie within different processing mechanisms people use to make sense of what they see. In their article on the PIA Model, Graf and Landwehr (2015) explain two different processing mechanisms. First, it is suggested that aesthetic stimuli like advertisements, are automatically processed (Graf & Landwehr, 2015). This automatic processing occurs without any intention of the viewer and is done by default like the unconscious process as referred to by Palmer et al. (2013). Second, Graf and Landwehr (2015) identify a controlled processing mechanism, which they conceptualize as 'higher order cognitive processing associated with detailed and deliberate stimulus analysis, meaning assignment, and interpretation that requires high amounts of cognitive capacity' (p. 5). This is not a passive process, but rather a reflective interaction with the visual.

The two processing mechanisms automatic processing and controlled processing as hypothesized by Graf and Landwehr (2015), might give an explanation to the previously mentioned contradiction: when automatically processing, familiar stimuli are favoured as Reber et al. (2004) indicate, since felt fluency is highest when something feels rather easy to comprehend. In contrast, novel, atypical stimuli bring more positive feelings when processed in a controlled manner, since this gives people the positive feeling of being able to solve the puzzle, for instance through comprehending Optimal Innovations as Giora et al. (2004) suggest. Puzzling with visual metaphors which are not too easy is assumed to lead to more processing pleasure, which is what advertisers gain for when using metaphors (Phillips, 1997). Felt fluency and processing pleasure might mediate the relation between metaphor structures and aesthetic pleasure in this case. In addition, the adding of context might as well have an influence on how easy or complex a visual is to process and comprehend, affecting aesthetic pleasure.

Hekkert et al. (2003) proposed a dual process model of aesthetic preference much like Graf and Landwehr (2015). Which process dominates aesthetic pleausre possibly depends on a number of factors according to Hekkert et al. (2003), like the available processing time. Short exposure times are expected to lead to the default processing mechanism which is automatic processing, whereas long exposure times allow for a close interaction with the stimulus and allow for controlled processing, resulting in differences in preference for either easy to process stimuli or more complex stimuli which require some puzzling.

The current study

This study investigated the influence of metaphor structures varying in creative complexity and the presence of context on aesthetic pleasure. In order to look into the role of processing mechanisms, exposure time was manipulated. For short exposure times, the relation between metaphor structures and aesthetic pleasure was expected to be mediated by felt fluency as based on the Fluency Theory (Reber et al., 2004). For long exposure times, the relation between metaphor structures and aesthetic pleasure was expected to be mediated by felt fluency in combination with processing pleasure, as based on the theories contradicting Fluency Theory. Figure 5 shows the conceptual model as used in this study.

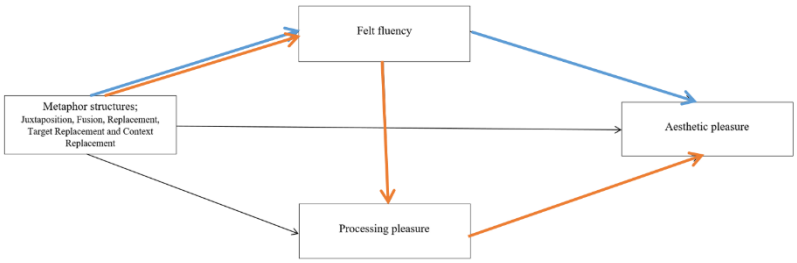

Figure 5. Conceptual model, in which the blue lines represent the processing path of short exposure times, and the orange lines represent long exposure times.

The following hypotheses were tested in this study:

H1: Metaphor structures have a main effect on felt fluency. Based on the complexity of the different metaphor structures according to Phillips and McQuarrie (2004), Juxtapositions feel most fluent to process, followed by Fusions and last Replacements regardless of exposure time.

H2: Exposure time has a main effect on felt fluency. Short exposure times lead to lower scores on felt fluency than long exposure times.

H3: Metaphor structures have an interaction effect with exposure time on aesthetic pleasure:

a. Based on Fluency Theory (Reber et al., 2004) and the complexity of the different metaphor structures according to Phillips and McQuarrie (2004), Juxtapositions score highest on aesthetic pleasure, followed by Fusions and last Replacements at short exposure times.
b. Based on theories by Berlyne (1971), Hekkert et al. (2003), and Giora et al. (2004) and the complexity of the different metaphor structures according to Phillips and McQuarrie (2004), Fusions score highest scores on aesthetic pleasure, followed by both Juxtapositions and Replacements at long exposure times.

H4: For short exposure times, felt fluency mediates the effect between metaphor structures and aesthetic pleasure as described in H3a, based on Fluency Theory (Reber et al., 2004). As felt fluency increases, so does aesthetic pleasure for the different metaphor structures.

H5: For long exposure times, felt fluency and processing pleasure together mediate the effect between metaphor structures and aesthetic pleasure as described in H3b, based on the theories by Berlyne (1971), Hekkert et al. (2003), and Giora et al. (2004). As felt fluency increases, processing pleasure decreases, resulting in lower scores on aesthetic pleasure.

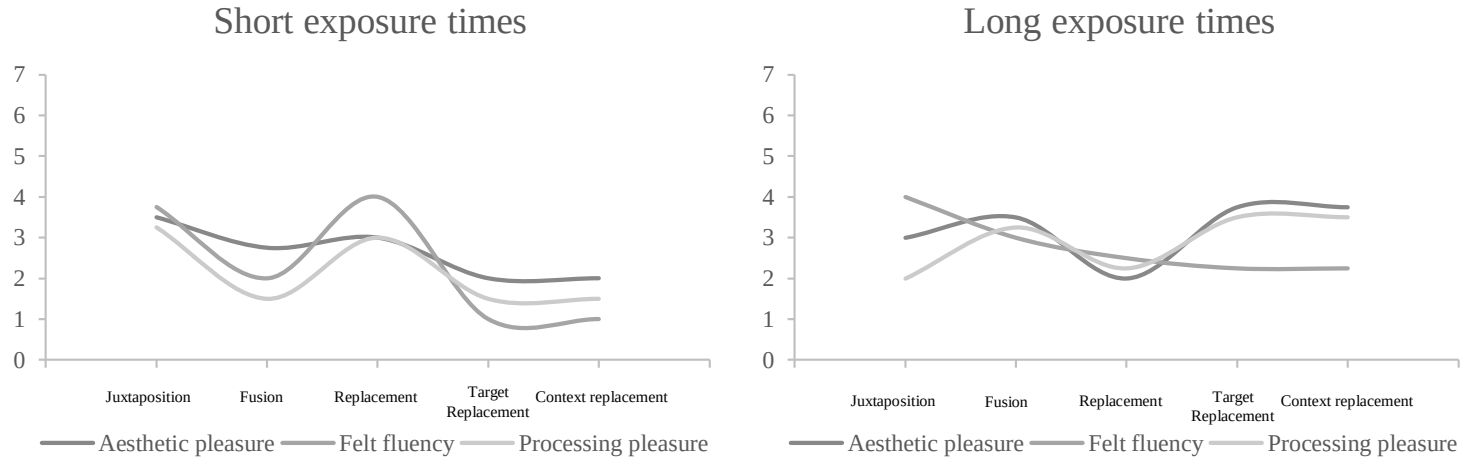

Figure 6. A visualization of the hypotheses for aesthetic pleasure, felt fluency, and processing pleasure at short and long exposure times.

Method

The pre-test and actual experiment which were executed in order to answer the research questions of this study were done in cooperation with Aniek van den Reek and Evelyn Gaarman. Since the design of this study was too big to perform for a single student within the scope of the Master's thesis, it was decided that the three students together carry out the same experiment and look at the data from different perspectives and with different research goals in mind. For this reason, some questions which were part of the final questionnaire were not used in the analysis of this study but were a part of the studies of Van den Reek or Gaarman. This method section will clearly define which measures were used to test the hypotheses of this study.

Pre-test

Design. Since the addition of context to visuals metaphors has not been studied before, it was necessary to create new and original stimuli for this study with clear distinctions in metaphor structure. For this reason, a pre-test was executed in order to test the consistency of the stimuli. This pre-test was performed with the help of a questionnaire using Qualtrics.

Materials. All metaphor examples needed to be equally difficult to comprehend and equal in terms of conventionality, meaning operation and verbal anchoring (brand names were kept as constant as possible). Attention was given to this in the conceptualization of new metaphors. In the designing process of the stimuli, attention was given to sizes of the portrayed objects, placement of the objects, and the colours used. This was all done as consistent as possible; i.e. all objects were placed as close to the centre of the frame as possible and all colours were kept neutral yet fitting with the colours of the portrayed object(s).

Participants. A total of 58 participants fully completed the pre-test. Seventeen males participated against 41 females, with a mean age of 24.5 years old (*SD* = 3.77). 54 participants follow(ed) higher education (hbo = 29, wo = 25) and four participants indicated other education levels.

Procedure and measures. Nineteen different metaphors presented in five different structures (Juxtaposition, Fusion, Replacement, Target Replacement and Context Replacement), were shown randomly in three different surveys, meaning participants saw a total of either six or seven metaphors. First, participants were asked to indicate their views on artful deviation and the complexity of the images per structure in order to ensure that the five structures differed. Artful deviation was measured on 7-point semantic differential scales (familiar/innovative, predictable/surprising, straightforward/creative) based on Turkenburg (2015). Complexity was measured on a 7-point semantic differential scale as well (the image is easy/difficult to understand).

Next, participants were asked for their perceived and actual comprehension. Perceived comprehension was tested by asking participants to what extent they felt like they understood the images on a 5-point Likert scale. Actual comprehension was measured through an open question asking participants to formulate the meaning of the advertisements in their own words.

In addition, participants were asked to indicate their views on the conventionality of the metaphors. This construct, as based on Van Mulken et al. (2014), was measured with three concepts on a 7-point semantic differential scale: usualness, novelty, and self-evidency. Participants were also asked to indicate to what extent the metaphors were clearly present in the five different structures. Furthermore, the fit of the brand name was tested and participants were provided with space to give any tips, feedback or remarks they had. The survey ended with questions on demographics. The questionnaire used for the pre-test can be found in appendix A.

Data analysis. With the help of SPSS, reliability of the scales was ensured (all sufficient Cronbach's Alpha) and means were calculated for all nineteen different metaphors for all measures. The table in appendix B provides an overview of all results. In addition, the answers provided by participants for the open questions were coded in terms of either correct or wrong

comprehension. This was done by two researchers in order to ensure sufficient intercoder reliability. Of the nineteen metaphors presented to participants, the ten which scored most consistent on conventionality and comparability, highest on perceived and actual comprehension, and showed the right pattern for complexity and artful deviation as based on Phillips and McQuarrie (2004) were used for the actual experiment. Small alterations to the images were made with use of the feedback from the participants.

The experiment

Design. An experiment was executed to investigate the effects of exposure time (100ms vs. 5000ms) x metaphor structure (Juxtaposition vs. Fusion vs. Replacement vs. Target Replacement vs. Context Replacement) on felt fluency, processing pleasure, and the aesthetic pleasure of advertisements. The effects were measured through a questionnaire. Exposure time was a between subjects factor, i.e. participants saw either all advertisements for a very short time period of 100ms or in a longer exposure time of 5000ms (based on Van Hooijdonk & Van Enschot, 2016). Metaphor structure was a within subjects factor. All participants saw two images per structure, i.e. two Juxtaposition images, two Fusion images, etc. Per product, however, only one structure was shown. Table 1 on the next page provides an overview of the different lists used in the experiment.

Materials. Ten advertisements for products of fictitious brands were presented in the experiment in varying metaphor structures. For each of the ten products, five images were created with the metaphor structures Juxtaposition, Fusion, Replacement, Target Replacement and Context Replacement. Figure 7 on the next page shows an example of one product with one metaphor presented in five different structures; toothpaste which makes your teeth glossy like a diamond. In addition to the ten advertisements with metaphors, ten advertisements

without metaphors were shown as fillers in order to distract participants from the task they were executing. In appendix C, all stimuli plus filler items can be seen.

Table 1.
Overview of all stimuli in all five different structures, presented to participants in one of five lists.

Metaphor structure	**List 1**	**List 2**	**List 3**	**List 4**	**List 5**
Filler	Filler 1	Filler 1	Filler 1	Filler 1	Filler 1
Filler	Filler 2	Filler 2	Filler 2	Filler 2	Filler 2
Juxtaposition 1	Duster	Condom	Deodorant	Energy bar	Suitcase
Context Replacement 1	Suitcase	Duster	Condom	Deodorant	Energy bar
Replacement 1	Energy bar	Suitcase	Duster	Condom	Deodorant
Filler	Filler 3	Filler 3	Filler 3	Filler 3	Filler 3
Fusion 1	Deodorant	Energy bar	Suitcase	Duster	Condom
Filler	Filler 4	Filler 4	Filler 4	Filler 4	Filler 4
Target Replacement 1	Condom_	Deodorant	Energy bar	Suitcase	Duster
Filler	Filler 5	Filler 5	Filler 5	Filler 5	Filler 5
Juxtaposition 2	Matrass	Sports shoes	Toothpaste	Detergent	Wc
Context Replacement 2	Wc	Matrass	Sports shoes	Toothpaste	Detergent
Filler	Filler 6	Filler 6	Filler 6	Filler 6	Filler 6
Filler	Filler 7	Filler 7	Filler 7	Filler 7	Filler 7
Replacement 2	Detergent	Wc	Matrass	Sports shoes	Toothpaste
Filler	Filler 8	Filler 8	Filler 8	Filler 8	Filler 8
Fusion 2	Toothpaste	Detergent	Wc	Matrass	Sports shoes
Filler	Filler 9	Filler 9	Filler 9	Filler 9	Filler 9
Target Replacement 2	Sports shoes	Toothpaste	Detergent	Wc	Matrass
Filler	Filler 10	Filler 10	Filler 10	Filler 10	Filler 10

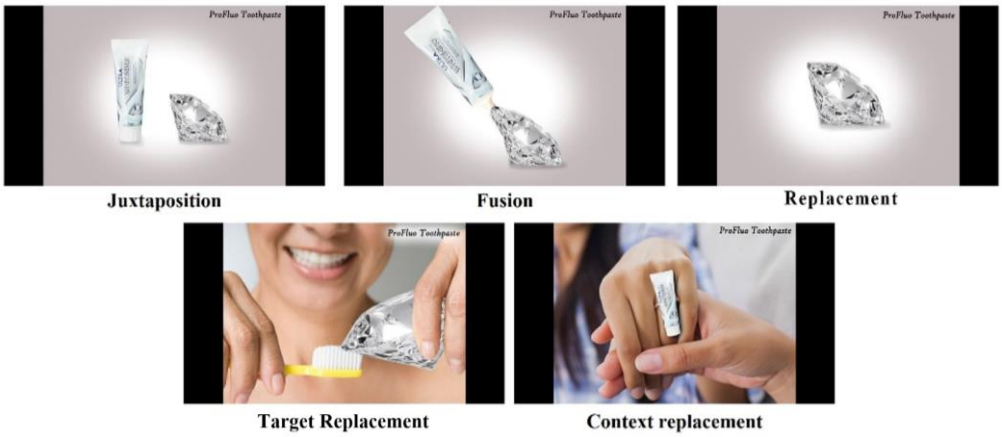

Figure 7. Example of one metaphor presented in five different structures

Participants. A total of 164 participants were recruited using the Human Subject Pool of the Humanities department within Tilburg University, and by asking people face-to-face at the university to participate in the experiment. In addition, participants were recruited at the Vrije Universiteit Amsterdam and in the personal network of the researchers. Of the participants, 118 (72%) were female and 46 (18%) were male. The age of the participants ranged from 17 to 38 years old, with an average age of 22 years old (M = 21.86, SD = 3.29). The educational level of participants was mostly academic as 152 participants (92.7%) were students at either Tilburg University or VU Amsterdam or had finished their master's degree at a Dutch university. The remaining twelve participants (7.3%) were either enrolled or graduated at a university of applied sciences (hbo). All participants were Dutch. Participants were rewarded with credits for the Human Subject Pool where applicable, and all participants received some candy as to thank them for participating.

Procedure. The Humanities department within Tilburg University was used to execute the experiment through an adapted ePrime script as used in Van Hooijdonk and Van Enschot (2016). Participants were seated behind laptops and were sequentially presented with a fixation cross (1000ms), blank screen (80ms), a stimulus (100ms or 5000ms depending on which condition they were assigned to), blank screen (80ms), and mask (2000ms), followed by the questionnaire. The first stimulus presented to participants was an exercise, and participants were provided the opportunity to ask questions before continuing to the actual experiment. Participants were manually referred to one of the exposure time conditions in order to ensure an equal spread of participants, but were presented with the advertisements and filler items at random through different lists in the ePrime script.

At the beginning of the experiment, participants were asked to answer some demographic questions: what is your gender, what is your age, and which level of education are you currently in. Afterwards participants got debriefed and thanked for their time.

In total, 81 participants saw all advertisements for 100ms, versus 83 participants for 5000ms. To ensure a fair division of products and metaphor structures, five different lists were created. Each list contained two advertisements per metaphor structure of different products; i.e. list one showed the toothpaste advertisement as Juxtaposition, whereas list two showed the Fusion advertisement. Lists 1, 2 and 4 all had 32 participants, whereas lists 3 and 5 were filled in by 34 participants. See Table 1 for the five different lists.

Measures. A short set of questions was presented to participants per stimulus they saw. This meant participants filled in the set of questions a total of 20 times (ten times for the metaphorical advertisements and ten times for the filler items). To measure the aesthetic pleasure of the advertising images, five 7-point semantic differentials were used based on the study by Van Enschot and Van Hooijdonk (2016): beautiful-ugly, attractive-unattractive, pleasurable-unpleasurable to look at, enjoyable-not enjoyable to see, nice-not nice to look at. The reliability of the scale was established by evaluating Cronbach's Alpha, which was $\alpha = .904$ in the lowest case.

The extent of felt fluency was measured with two 7-point semantic differentials: no effort/takes effort to understand what is depicted, and easy/difficult to recognize, as based on Van Enschot and Van Mulken (2014). Cronbach's Alpha for this scale was $\alpha = .727$ in the lowest case. Comprehension was controlled for by letting participants fill in the advertised product and the meaning of the advertisements in their own words.

Last, processing pleasure was measured with two 7-point Likert scales: 'I had fun being busy with the advertisements', and 'I liked thinking about the advertisements' (based on Van Enschot, Das, Beuken, and Jordans, 2016). Cronbach's Alpha for this scale was $\alpha = .920$ in the lowest case. The complete questionnaire can be seen in Appendix D. All individual reliability scores for the scales per advertisement can be found in Appendix E.

Data preparation and analysis. In order to be able to answer the research questions, multiple types of analyses were used. Before analysis, the data gained through ePrime needed to be prepared in order to run analyses in SPSS. Due to the design in which participants were presented with different advertised products in each metaphor structure, advertised products were not individually evaluated in the analysis. Rather, all five different advertised products presented as Juxtapositions were handled as Juxtaposition_1, Juxtaposition_2, etc. Analyses were thus run only for the metaphor structures in general, and not per image.

In order to investigate the effects of metaphor structure and exposure time on aesthetic pleasure, felt fluency and processing pleasure, three mixed ANOVAs with repeated measures were performed.

In order to check for any mediating roles, multiple bivariate correlations were performed; one to investigate for possible correlations between aesthetic pleasure and felt fluency, one for aesthetic pleasure and processing pleasure, and a last one for felt fluency and processing pleasure. This was done with split file on in SPSS to measure the effects of exposure time. In addition, since the outcomes of the mixed ANOVAs and the bivariate correlations hinted at mediation, multiple mediation analyses were performed with the help of MEMORE; a macro for SPSS comparable with PROCESS that estimates the total, direct, and indirect effects through multiple mediators in a within-subjects repeated measures design (Montoya & Hayes, in press).

Comprehension of the images was analysed through manually coding the open answers provided by the participants. Each answer as provided by participants was coded as either correct (1) or incorrect (0) by two researchers, and any mismatching results were checked by a third independent researcher in order to ensure intercoder reliability. An example of an answer provided by a participant which was coded as wrong for both product and message was ‘Zwemspullen (swimming supplies) – Dat het belangrijk is om veilige materialen te hebben

wanneer in de zee of het zwembad wordt gezwommen (It is important to have safe materials when one goes swimming in the sea or pool)' when the actual product was a condom. An example of an answer provided by a participant which was coded correct for both product and message was 'Deodorant – Na het gebruik van deze deodorant lijkt het alsof je onder de douche vandaan komt (After using this deodorant it seems like you have just finished taking a shower)'. It was considered important that participants mentioned attributes of the source and target domain in their answers in order to ensure the complete metaphor was understood.

Results

In order to investigate any effects metaphor structures have on aesthetic pleasure, felt fluency, and processing pleasure, means were investigated. Table 2 provides an overview of all means and standard deviations. The following paragraphs elaborate on this table.

Table 2.

Overview of mean scores on all three variables per metaphor structure, split on exposure time.

Exposure time	**Metaphor Structure**	**Aesthetic pleasure *M* (*SD*)**	**Felt fluency *M* (*SD*)**	**Processing pleasure *M* (*SD*)**
100ms	Juxtaposition	3.79 (.83)$^{1.2}$	3.89 (1.27)^{2}	4.24 (1.34)^{2}
	Fusion	3.57 (1.02)^{1}	3.39 (1.29)^{1}	3.85 (1.16)^{1}
	Replacement	3.91 (1.01)$^{1.2}$	4.59 (1.36)^{3}	3.73 (1.11)^{1}
	Target Replacement	4.12 (.90)^{2}	3.94 (1.20)^{2}	3.96 (1.14)$^{1.2}$
	Context Replacement	3.96 (.99)$^{1.2}$	3.35 (1.33)^{1}	3.73 (1.29)^{1}
5000ms	Juxtaposition	3.71 (1.03)^{1}	4.97 (1.19)$^{2.3}$	4.82 (1,17)$^{2.3}$
	Fusion	4.15 (1.24)^{2}	5.32 (1.12)^{3}	4.89 (1.15)^{3}
	Replacement	3.52 (1.05)^{1}	3.56 (1.44)^{1}	4.25 (1.37)^{1}
	Target Replacement	3.92 (1.19)$^{1.2}$	4.82 (1.30)^{2}	4.68 (1.24)$^{2.3}$
	Context Replacement	3.67 (1.10)^{1}	3.85 (1.38)^{1}	4.52 (1.26)$^{1.2}$

Note. Means bearing the same superscript numbers do not differ significantly ($p < .05$)

Aesthetic pleasure

A mixed ANOVA with repeated measures was executed to investigate the effect of metaphor structure and exposure time on aesthetic pleasure. Mauchly's Test of Sphericity indicated that the assumption of sphericity had been violated, $\chi^2(9) = 20.86$, $p = .013$. In order to correct for this, Huynh-Feldt results were used.

A significant main effect of metaphor structure was found, suggesting that aesthetic pleasure varied for at least one of the different metaphor structures ($F(3.88, 629.01) = 3.22$, $p = .013$, $R^2 = .019$). A significant main effect of exposure time was not observed, indicating exposure time alone did not have a significant effect on aesthetic pleasure ($F(1, 162) = .52$, $p = .47$, $R^2 = .003$). Means revealed that aesthetic pleasure scores for 100ms ($M = 3.87$, $SE = .08$) and 5000ms ($M = 3.79$, $SE = .08$) were close together.

An interaction effect was found of metaphor structure * exposure time (F (3.88, 629.01) = 8.33, $p < .001$, $R^2 = .049$). For 100ms, aesthetic pleasure seemed highest for Target Replacement ($M = 4.13$, $SD = .90$), followed by Context Replacement ($M = 3.96$, $SD = .996$), sole Replacement ($M = 3.91$, $SD = 1.01$), Juxtaposition ($M = 3.79$, $SD = .83$), and Fusion ($M = 3.57$, $SD = 1.02$). However, Bonferroni pairwise comparisons revealed that the differences between Fusions and Target Replacements were the only ones significant. All other metaphor structures did not differ significantly. Figure 8 shows the results in a visual manner.

For 5000ms, aesthetic pleasure seemed highest for Fusion ($M = 4.15$, $SD = 1.24$), followed by Target Replacement ($M = 3.92$, $SD = 1.19$), Juxtaposition ($M = 3.71$, $SD = 1.03$), Context Replacement ($M = 3.67$, $SD = 1.10$), and sole Replacement ($M = 3.52$, $SD = 1.05$). However, Bonferroni pairwise comparisons revealed that only Fusion differed significantly from Juxtaposition, sole Replacement, and Context Replacement. All other metaphor structures did not differ significantly.

Felt Fluency

A mixed ANOVA with repeated measures was executed to investigate the effect of metaphor structure and exposure time on felt fluency. A significant main effect of metaphor structure was found, suggesting that felt fluency varied for at least one of the different metaphor structures (F (4, 648) = 13.91, $p < .001$, $R^2 = .079$)). A significant main effect of exposure time was also observed, indicating exposure time also had a significant effect on felt fluency (F(1, 162) = 33.71, $p < .001$, $R^2 = .17$), in which 5000ms led to higher scores than 100ms.

An interaction effect of metaphor structure * exposure time was also found (F (4, 648) = 34.68, $p < .001$, $R^2 = .176$). For 100ms, felt fluency seemed highest for sole Replacement (M = 4.59, SD = 1.36), followed by Target Replacement (M = 3.94, SD = 1.20), Juxtaposition (M = 3.89, SD = 1.27), Fusion (M = 3.39, SD = 1.29), and Context Replacement (M = 3.35, SD = 1.33). However, Bonferroni pairwise comparisons revealed that differences between Juxtapositions and Target Replacements, and Fusions and Context Replacements were not significant. All other differences were significant.

For 5000ms, felt fluency seemed highest for Fusion (M = 5.32, SD = 1.24), followed by Juxtaposition (M = 4.97, SD = 1.19), Target Replacement (M = 4.81, SD = 1.29), Context Replacement (M = 3.85, SD = 1.38), and sole Replacement (M = 3.56, SD = 1.44). However, Bonferroni pairwise comparisons revealed that the differences between Juxtapositions and Fusions, Juxtapositions and Target Replacements, and sole Replacements and Context Replacements were not significant. All other differences were significant.

Processing pleasure

A mixed ANOVA with repeated measures was also executed in order to investigate the effect of metaphor structure and exposure time on the extent of processing pleasure. Mauchly's Test of Sphericity indicated that the assumption of sphericity had been violated, $\chi^2(9) = 32.17$,

$p < .001$. In order to correct for this, Huynh-Feldt results were used. A significant main effect of metaphor structure was found, suggesting that processing pleasure varied for at least one of the different metaphor structures used in the experiment ($F(3.79, 614.07) = 11.71$, $p < .001$, $R^2 = .067$). A significant main effect of exposure time was also observed, indicating exposure time had a significant effect on processing pleasure as well ($F(1, 162) = 21.85$, $p < .001$, $R^2 = .119$). All metaphor structures scored lower on processing pleasure at 100ms.

An interaction effect was found of metaphor structure * exposure time (F (3.79, 614.07) = 2.68, $p = .034$, $R^2 = .016$). For 100ms, processing pleasure seemed highest for Juxtaposition ($M = 4.24$, $SD = 1.34$), followed by Target Replacement ($M = 3.96$, $SD = 1.14$), Fusion ($M = 3.85$, $SD = 1.16$), Context Replacement ($M = 3.73$, $SD = 1.29$), and sole Replacement ($M = 3.73$, $SD = 1.11$). Bonferroni pairwise comparisons revealed that only differences between Juxtaposition and Fusion, and sole Replacement and Context Replacement were significant.

For 5000ms, processing pleasure seemed highest for Fusion ($M = 4.89$, $SD = 1.15$), followed by Juxtaposition ($M = 4.82$, $SD = 1.17$), Target Replacement ($M = 4.68$, $SD = 1.24$), Context Replacement ($M = 4.52$, $SD = 1.26$), and sole Replacement ($M = 4.25$, $SD = 1.37$). Bonferroni pairwise comparisons revealed that sole Replacements significantly differed from Juxtapositions, Fusions, and Target Replacements. In addition, Fusions and Context Replacements also differed significantly.

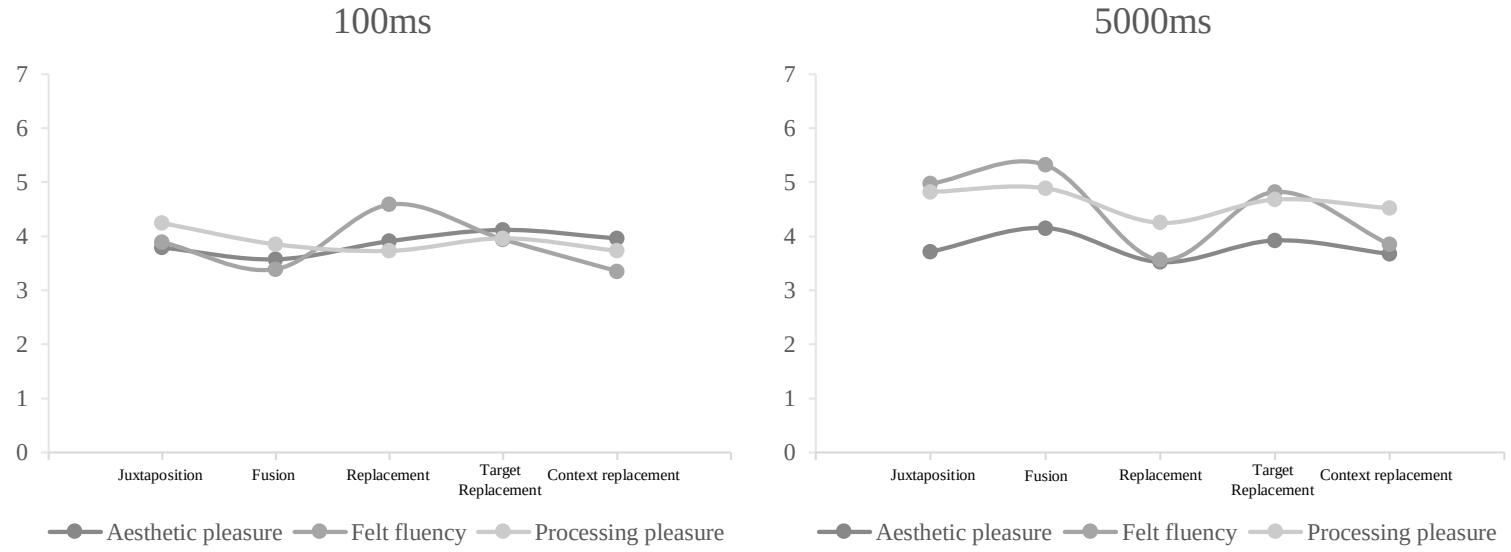

Figure 8. Results of the ANOVAs for the three different variables, split on exposure time

Comprehension

As the previous results indicated, there were some differences in felt fluency for the different metaphor structures. However, it is not necessarily true that if an image felt fluent to process, that it is also correctly understood. In order to investigate this, participants were asked to indicate the product and message of all images in their own words. The answers provided by participants were coded as wrong or correct, resulting in frequencies of comprehension for all metaphor structures split on exposure time. Table 3 provides an overview of these results.

As the numbers in the table show, large differences can be seen regarding comprehension for the two different exposure times. At 100ms, product recognition and message comprehension scored much lower when compared to 5000ms. When looking at an exposure time of 100ms, it can be stated that especially the metaphor structure sole Replacement scored very bad at comprehension whereas it scored rather high on felt fluency. This indicates participants feel the image is rather easy to comprehend, but actually completely missed out on the product and metaphorical message communicated in the images. The same can be said for Context Replacements, in which the portrayed product was miscomprehended both times for over half of the participants.

At an exposure time of 5000ms, product recognition is very high for all metaphor structures with the exception of sole Replacements. Comprehension of the message was high for Juxtapositions, Fusions, and Target Replacements, which also scored highest on felt fluency at 5000ms. Comprehension was lowest for Context Replacements and sole Replacements which scored lowest on felt fluency too. This hints at a positive relation between felt fluency and comprehension at long exposure times; the more fluent it feels to process an image, the better it is also actually comprehended. The opposite appears to be true for short exposure times of 100ms; felt fluency is not a good proxy for comprehension in this case since metaphor structures which scored high on felt fluency appear to be miscomprehended largely.

Table 3.
Comprehension per metaphor structure

Exposure time	**Metaphor structure**	**Product recognition**			**Metaphorical message**		
		Nothing correct	1 of 2 correct	2 of 2 correct	Nothing correct	1 of 2 correct	2 of 2 correct
100ms	Juxtaposition	25.9%	49.4%	24.7%	40.7%	39.5%	19.8%
	Fusion	39.5%	49.4%	11.1%	51.9%	39.5%	8.6%
	Replacement	98.8%	1.2%	-	100%	-	-
	Target Replacement	35.8%	50.6%	13.6%	63%	28.4%	8.6%
	Context Replacement	53.1%	35.8%	11.1%	81.5%	12.3%	6.2%
5000ms	Juxtaposition	-	12.0%	88.0%	-	21.7%	78.3%
	Fusion	-	8.4%	91.6%	-	16.9%	83.1%
	Replacement	10.8%	26.5%	62.7%	12.0%	38.6%	49.4%
	Target Replacement	1.2%	20.5%	78.3%	2.4%	27.7%	69.9%
	Context Replacement	-	21.7%	78.3%	21.7%	50.6%	27.7%

Correlations

Felt fluency and aesthetic pleasure. In order to measure any possible mediations, bivariate Pearson's correlations were inspected taking exposure time into consideration but disregarding metaphor structures. For felt fluency * aesthetic pleasure, there was a positive, medium sized correlation which was statistically significant at an exposure time of 100ms (r = .303, p = .006). At 5000ms, the effect was even bigger (r = .602, p < .001). This means that as felt fluency increases, so does aesthetic pleasure.

Processing pleasure and aesthetic pleasure. A positive correlation with medium effect size was also apparent for the variables processing pleasure and aesthetic pleasure at 100ms (r = .448, p < .001). At 5000ms, the same effect was observed (r = .421, p < .001). This also indicates that as processing pleasure goes up, so does aesthetic pleasure in general.

Felt fluency and processing pleasure. A positive correlation with medium effect size was also apparent for the variables felt fluency and processing pleasure at 100ms ($r = .405$, $p < .001$). At 5000ms, the same effect was visible with a slightly lower effect size ($r = .347$, $p = .001$). Therefore, felt fluency and processing pleasure have a positive effect on one another; as one scores higher, so does the other.

Mediation

Since the outcomes of the mixed ANOVAs and the bivariate correlations hint at mediation, multiple mediation analyses were performed with the help of MEMORE.

MEMORE. MEMORE is a macro for SPSS that estimates the total, direct, and indirect effects through multiple mediators in a within-subjects repeated measures design (Montoya & Hayes, in press). In Figure 9, a schematic model of how MEMORE works can be seen, where X represents the five different metaphor structures. Y in the model represents the outcome variable aesthetic pleasure. M_1 represents the predicted mediator felt fluency and M_2 represents the predicted mediator processing pleasure. This provides four different paths that can take effect; a direct path from X to Y without mediations, indirect path 1 which goes from X through M_1 to Y, indirect path 2 which goes from X through M_2 to Y, and indirect path 3 which goes from X through both M_1 and M_2 to Y. A drawback of MEMORE is that it can compare just two metaphor structures at the same time and that it does not allow for moderators, meaning exposure time could not be treated as a moderator but was rather just used as a condition to split results. Therefore, the MEMORE analysis was run a total of 20 times, comparing all different metaphor structures with each other in both exposure time conditions in order to investigate any possible mediation effects.

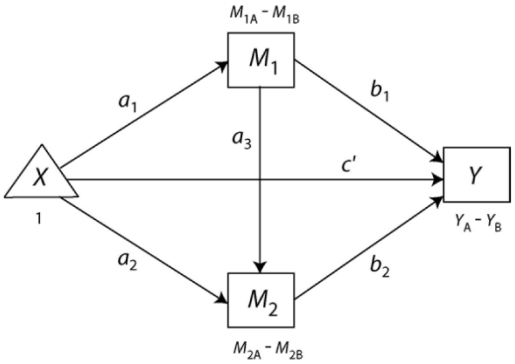

Figure 9. Schematic model of MEMORE (Montoya & Heyes, in press)

As Table 4 below shows, most of the results were not significant as their confidence intervals straddle zero. Most of the significant mediations take place via indirect path 3, which is the path going from metaphor structure to aesthetic pleasure through first felt fluency and then processing pleasure. As felt fluency goes up, so does processing pleasure. This is most distinct for the metaphor structure Fusion, which shows significant results for indirect path 3 in combination with all three type of Replacement structures at 5000ms. The analysis for Fusion and Target Replacement is taken as an example to explain the mediation in more detail, since it can be seen that all three paths show significant results.

Table 4.
Confidence intervals for all paths from MEMORE

Exposure time	**Metaphor structures**	**Ind1**	**Ind2**	**Ind3**
100ms	F-J	CI [-.1460;.0810]	CI [-.0057;.1780]	CI [-.0048;.0968]
	R-J	CI [-.2713;.0060]	CI [-.0152;.3316]	CI [-.1545;.0046]
	TR-J	CI [-.0735;.0597]	CI [-.0233;.0981]	CI [-.0367;.0139]
	CR-J	CI [-.0856;.0992]	CI [.0338;.2730]	CI [.0118;.1554]
	R-F	CI [-.1654;.2321]	CI [.0621;.4506]	CI [-.3336;-.0468]
	TR-F	CI [-.2805;-.0110]	CI [-.0385;.0511]	CI [-.0874;.0290]
	CR-F	CI [-.0418;-.0241]	CI [-.0591;.1287]	CI [-.0699;.1437]
	TR-R	CI [.0250;.3534]	CI [-.3210;-.0166]	CI [.0089;.1669]
	CR-R	CI [-.1017;.3113]	CI [-.4402;-.0658]	CI [.1028;.3917]
	CR-TR	CI [-.0334;.1590]	CI [-.0450;.0793]	CI [-.0005;.1098]
5000ms	F-J	CI [-.2415;-.0119]	CI [-.0939;.0693]	CI [-.0665;.0012]
	R-J	CI [-.1514;.2615]	CI [-.0121;.1825]	CI [-.0138;.1710]
	TR-J	CI [-.0331;.1246]	CI [-.0227;.1402]	CI [-.0102;.0349]
	CR-J	CI [-.0707;.2757]	CI [-.0447;.1253]	CI [-.0038;.1300]
	R-F	CI [.2440;.9377]	CI [-.0207;.2285]	CI [.0305;.4266]
	TR-F	CI [.0122;.2313]	CI [.0016;.1341]	CI [.0003;.3554]
	CR-F	CI [-.0729;.5198]	CI [-.2272;.0782]	CI [.0960;.7090]
	TR-R	CI [-.4340;.0490]	CI [-.1348;.0695]	CI [-.3414;-.0266]
	CR-R	CI [-.1147;.0202]	CI [-.2176;.0014]	CI [-.0845;.0048]
	CR-TR	CI [-.1596;.1796]	CI [-.0936;.0613]	CI [.0088;.2341]

Ind1 = metaphor structure → felt fluency → aesthetic pleasure
Ind2 = metaphor structure → processing pleasure → aesthetic pleasure
Ind3 = metaphor structure → felt fluency → processing pleasure → aesthetic pleasure
*Light grey results indicate insignificancy

As can be seen in Figure 10, the direct path from X to Y is insignificant in this example, whereas all three indirect paths are significant. The significant indirect effects hint at mediation, in contrast to the insignificant direct path.

For felt fluency, Target Replacements scored significantly lower than Fusions, b = .50, which is apparent from the means from the previously elaborated on ANOVA as well. In addition, the path from felt fluency to aesthetic pleasure is significantly lower for Target Replacements as well, b = .21. Since both paths are significant and indicate Target Replacements scored lower on felt fluency and aesthetic pleasure (although this difference was very small and not significant), it can be assumed that felt fluency has mediated the effects of Target Replacements versus Fusions on aesthetic pleasure. This also becomes apparent from the confidence intervals of the indirect effect. This indicates an increase in felt fluency results in an increase in processing pleasure which results in a higher score on aesthetic pleasure. This mediation effect is strongest for Fusions, which felt more fluent to process and also score significantly higher on processing pleasure, and slightly higher (although not significant) on aesthetic pleasure than Target Replacements. The table in Appendix F provides an overview of all outcomes of the 20 analyses performed with MEMORE.

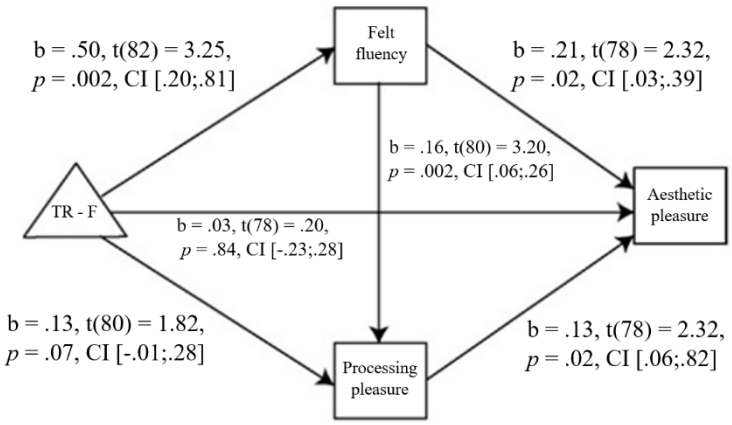

Figure 10. Filled in schematic model of MEMORE for the combination TR-F at 5000ms.

Discussion and conclusions

The goal of this study was to investigate under what circumstances advertisements with visual metaphors give viewers aesthetic pleasure. According to multiple studies (e.g. Graf & Landwehr, 2015; Hekkert et al., 2003), this might depend on how the images get processed; in an automatic or controlled manner. In order to manipulate the processing mechanism used by viewers this study made use of different exposure times, in which it was presumed that short exposure times of 100ms lead to an automatic processing mechanism, whereas longer exposure times of 5000ms give viewers the chance to actively think and interact with the visuals in a controlled way. In addition, this study aimed to find out whether felt fluency and processing pleasure have a mediating effect on aesthetic pleasure, and how the addition of context influences felt fluency, comprehension, and processing pleasure for Replacements.

The effects of metaphor structure on felt fluency

Based on the complexity of the different metaphor structures according to Phillips and McQuarrie (2004), it was hypothesized that Juxtapositions would feel most fluent to process, followed by Fusions and last Replacements regardless of exposure time. The results presented in the last chapter indeed indicate a main effect of metaphor structures on felt fluency, however this effect is influenced by exposure time since an interaction effect was also present. This is partly contrasting the hypothesis. Overall, the complexity of the different structures as proposed by Phillips and McQuarrie (2004) is supported with the results from this study, since Juxtaposition scored highest followed by Fusion and Replacement when not taking exposure time into consideration. However, the patterns for the different metaphor structures on felt fluency differ when applying different exposure times. At 5000ms, Fusion for instance scored better on felt fluency than Juxtaposition, whereas there was no difference between these two structures at 100ms.

Besides a main effect of metaphor structure on felt fluency and the interaction effect of metaphor structure and exposure time on felt fluency, it was hypothesized that exposure time alone would also have a main effect on felt fluency. It was expected that short exposure times lead to lower scores on felt fluency than long exposure times. The results support this hypothesis, since means revealed higher scores on felt fluency for exposure times of 5000ms than 100ms. Even though the interaction effect shows that patterns on felt fluency differ for the different metaphor structures based on exposure time, in general felt fluency is higher at 5000ms. This indicates people feel an image is easier to process when they have more time to look at an image and absorb all information presented.

Furthermore, the results provide extra knowledge on the complexity of visual metaphors with context; whenever a Replacement is extended with context, this leads to more felt fluency, but whenever the advertised product is surrounded by context from the source domain, felt fluency decreases. This effect is found for both exposure times.

The effects of metaphor structure on aesthetic pleasure

Exposure time and aesthetic pleasure. The third hypothesis set for this study concerned an interaction effect between metaphor structure and exposure time on aesthetic pleasure. Based on the Fluency Theory (Reber et al., 2004) and the complexity of the different metaphor structures according to Phillips and McQuarrie (2004), at a short exposure time Juxtapositions were expected to score highest on aesthetic pleasure, followed by Fusions and last Replacements. It was yet unclear how Target and Context Replacements would be perceived. Results of this study support this hypothesis in part. A main interaction effect was observed in which it seemed Juxtaposition scored highest on aesthetic pleasure followed by Fusion and Replacement (supporting the hypothesis) at a short exposure time, but the scores did not differ significantly. Therefore, complexity seemed to have no clear distinct effect on aesthetic pleasure at 100ms, since all structures had scores very close together.

At long exposure times, Fusions were expected to score highest on aesthetic pleasure followed by both Juxtapositions and Replacements as based on, among other theories, Berlyne's inverted U-curve (1971). This hypothesis is supported by this study, as Fusions scored higher on aesthetic pleasure at 5000ms than both Juxtapositions and Replacements, whereas scores for the latter did not differ in means of aesthetic pleasure.

Influence of felt fluency on aesthetic pleasure. At a short exposure time, Fusions did not score higher on aesthetic pleasure than Replacements, which contradicts hypothesis H3a. A possible explanation for this finding may lie within the influencing role of felt fluency, in combination with comprehension, on aesthetic pleasure. Replacements are considered most difficult to understand by Phillips and McQuarrie (2004), since the advertised product is not depicted and needs to be inferred from the source domain without contextual clues. At 100ms, participants saw only the depicted object and felt they could process this in a fluent manner. However, scores on comprehension indicate participants were completely unaware of any metaphorical meaning for this structure. Rather, they believed that the depicted object was the advertised product, explaining why the Replacement scored high on felt fluency. This is in line with the findings by Van Enschot and Van Hooijdonk (2016).

Fusions, on the other hand, scored lower on felt fluency than Replacements at 100ms, indicating participants had some trouble with processing these. This is supported by results on comprehension. The effect of felt fluency on aesthetic pleasure can be explained with the Fluency Theory by Reber et al. (2004); Fusions did not score higher on aesthetic pleasure than Replacements, possibly because they were too complex at short exposure times to lead to high scores on felt fluency, while the Fluency Theory states high scores on felt fluency result in high scores on aesthetic pleasure.

The role of processing pleasure. In addition, it was hypothesized that only felt fluency would mediate the effect metaphor structure has on aesthetic pleasure for short exposure times, and not processing pleasure. This was hypothesized based on different processing mechanisms people use to process creative complex visuals. It was expected that short exposure times lead to automatic processing, in which easy visuals would be preferred as based on the Fluency Theory (Reber et al., 2004). However, the results indicate this is not completely supported, since there seems to be no clear preference for the most easy to process structure at 100ms.

This might indicate processing pleasure does play a role also at short exposure times. Even though the exposure time was very short, people may have still processed the visuals in a controlled manner instead of automatically. A possible explanation for this could be that even though a mask was applied in the experiment to stop participants from processing what they saw, people still kept thinking about the visual they were presented with after it was gone. Future research could investigate this, for instance by replicating the experiment with the addition of a distractor task to make sure processing really stops after the visual has been shown.

For long exposure times, it was hypothesized that Fusions would score highest on aesthetic pleasure, followed by both Juxtapositions and Replacements. This expectation was based on, among other theories, the inverted U-curve (Berlyne, 1971), which states that visuals which are not too easy but also not too complex to process lead to most positive affect. Results on aesthetic pleasure alone support this hypothesis. However, it was expected that this effect of metaphor structure on aesthetic pleasure would be mediated through felt fluency followed by processing pleasure. Based on for example the Optimal Innovation Hypothesis (Giora et al., 2004), it was expected that visuals which require some effort to process and thus score low on felt fluency, would lead to high scores on processing pleasure. High processing pleasure would in turn lead to aesthetic pleasure.

Results from this study do not support this hypothesis. Fusions did score high on processing pleasure and aesthetic pleasure as predicted, but contrary to expectations this structure also scored high on felt fluency. This indicates that also at long exposure times, high scores on felt fluency lead to processing pleasure and aesthetic pleasure rather than low scores.

The ANOVA's and correlations support this positive connection between felt fluency, processing pleasure, and aesthetic pleasure at all exposure times, hinting at mediation. As felt fluency goes up, so do processing pleasure and aesthetic pleasure for the different metaphor structures, regardless of exposure time. However, the majority of mediation analyses performed with MEMORE turned out to be insignificant. A possible explanation for this could lie in the fact that the differences in scores for the metaphor structures on all variables were too close together. Especially at for instance 100ms, very little differences were found for the different metaphor structures on aesthetic pleasure. Thus, even though there seems to be a connection between felt fluency, processing pleasure and aesthetic pleasure, the differences between the metaphor structures were not big enough to actually conclude mediation is taking place.

Overall conclusion

The research questions for this study were:

What is the influence of exposure time on aesthetic pleasure of visual metaphors in advertisements with varying degrees of creative complexity, with or without context?

To what extent do processing pleasure and felt fluency mediate these effects on aesthetic pleasure?

It can be concluded that the results of this study mostly support the Fluency Theory by Reber et al. (2004). There seems to be a preference for visuals that feel most fluent to process as the Fluency Theory states, regardless of exposure time. However, which structures feel more fluent to process is dependant of exposure time.

At short exposure times, the least complex structures (based on Phillips & McQuarrie, 2004) score better on felt fluency as expected. Yet, at long exposure times, structures which were assumed to be complex according to Phillips and McQuarrie (2004) scored better not only on processing pleasure and aesthetic pleasure as based on Berlyne's inverted U-curve (1971), but also on felt fluency. This indicates that a combination of the theories by Berlyne (1971), Hekkert et al. (2003) and Giora et al. (2004), and Reber et al. (2004) is supported by the results of this study at long exposure times; visuals which are not too simple but also not too difficult in means of complexity (based on Phillips and McQuarrie, 2004) score best on aesthetic pleasure as expected based on Berlyne (1971) and co, but not because they score lower on felt fluency, but rather because they felt fluent and were pleasurable to process.

The mediating pattern of felt fluency and processing pleasure on aesthetic pleasure is most distinct at 5000ms. This indicates longer exposure times indeed allow for controlled processing, giving viewers a chance to actively think, interact and puzzle with what they see. This is assumed to provide viewers with pleasure, based on theories by Phillips (1997) and Van Mulken et al. (2015). At 100ms, this idea is less distinct, since participants in this condition overall gave lower scores for processing pleasure. Participants indicated they found their task difficult and results on comprehension support this. Also scores on aesthetic pleasure do not differ a lot per structure at short exposure times.

Furthermore, the addition of context seems to increase scores on felt fluency, comprehension and processing pleasure in case of Target Replacements. However, Context Replacements do not significantly score better on aesthetic pleasure than other metaphor structures without context, so more research needs to be done to examine why and when context has added value for visual metaphors and when not.

Limitations and future research

A limitation which might have influenced the effects found in the current study is the sample. Since only students with a higher education participated in this study, the results are not generalizable to the population. Future research could replicate this study in different samples in order to exclude the influence of e.g. age and educational level. In addition, participants in the 100ms exposure time condition complained a lot after the experiment that their task was too difficult and became boring. Participants indicated they found it extremely difficult to make sense of what was shown to them and stated they lost motivation after encountering many images they could not identify. This is a possible explanation for low results on processing pleasure at the 100ms condition. Possibly a break or a number of fillers shown to participants for a longer exposure time could neutralize this effect of boredom.

In addition, it is interesting to consider different ways in which different processing mechanisms can be triggered. As said before, even at 100ms participants probably did some controlled processing in order to try to get to a correct understanding of what they had just seen, even though a mask was shown after each stimulus in order to stop processing. It is therefore questionable whether the two different exposure times really resulted in two different processing mechanisms; controlled and automatic processing. Future research could look into this and apply different triggers for processing mechanisms, like priming through the context in which an item is presented, and observer characteristics as suggested by Hekkert et al. (2004).

Another limitation of this study is the fact that not all metaphor structures were altered in versions with and without context. For instance Juxtapositions can possibly be made prettier too with the addition of context, like in the example of the car shown alongside the hippos. In this study, Juxtaposition and Fusions were only shown to participants with plain coloured backgrounds. Future research could study whether the addition of context for these metaphor structures also has an influence on aesthetic pleasure.

A last limitation of the study concerns the analysis of the mediation effects. The best fitted way to analyse the findings was with MEMORE since other tools like ANOVAs and PROCESS do not fully suffice to find mediations in a repeated measures design. However, due to the fact that MEMORE is very new and still in press, the options are still limited. As an example, adding exposure time as a possible moderator was not possible. Hence the mediation results should be interpreted with some nuance.

Since this was the first study that investigated the new metaphor structures Target Replacement and Context Replacement, future research could investigate these two forms in more detail. What is it that makes a Context Replacement more difficult to comprehend and less fun to process when compared to a Target Replacement?

Last, it would be interesting to investigate the influence of adding context to advertisements in general, also in the field of incongruent advertisements and visual irony outside the scope of visual metaphor. This would provide a bigger picture of the effects of context and the importance of context in the field of visual advertisements in general. After all, it is interesting for advertisers to make use of a variety of advertisements differing in creative complexity to address a target audience as big as possible in order to achieve the ultimate goal of advertising; sales.

Practical implications

The present study examined the extent to which advertisements with visual metaphors varying in creative complexity yield aesthetic pleasure. Therefore, some implications for advertisers would be of value. Previous studies as well as this one indicated that metaphorical Replacements are often misunderstood and are also of less value to viewers in means of processing pleasure and aesthetics. However, when context is added to Replacements resulting in Target Replacements, this form does seem to work.

Therefore, it seems smart that advertisements balance complexity and creativity since this is appreciated best by viewers. It would be wise for advertising agencies and marketers to find the ultimate balance at the top of the inverted U-curve Berlyne (1971) proposes. This can best be done by adding context to metaphors and by creating novel hybrids between two typical objects, allowing for restoration of the two separate objects but also allowing for an immersive visual with extra meaning, which does feel fluent to process.

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Appendices

Appendix A – Questionnaire pre-test (in Dutch)

Allereerst alvast bedankt voor je deelname!

De enquête die je zo gaat invullen is onderdeel van onze masterscriptie en deze zal ongeveer 20 minuten duren. Je krijgt zometeen een aantal advertenties te zien waarin gebruik wordt gemaakt van visuele vergelijkingen/metaforen. We zouden je willen vragen om hierover een aantal vragen te beantwoorden. Er zijn hierbij geen goede of foute antwoorden en je deelname is anoniem.

We willen je nogmaals bedanken voor je tijd en mening waar we erg veel aan hebben.

Groet,

Aniek van den Reek
Evelyn Gaarman
Steffie van der Horst

Bekijk de volgende advertenties en beantwoord de onderstaande vragen per advertentie.

Afbeelding 1

Afbeelding 2

Afbeelding 3

Afbeelding 4

Afbeelding 5

Afbeelding 1 is:

0	0	0	0	0	0	0

Rechttoe-rechtaan Creatief

0	0	0	0	0	0	0

Innovatief Ouderwets

0	0	0	0	0	0	0

Voorspelbaar Verrassend

Afbeelding 2 is:

0	0	0	0	0	0	0

Rechttoe-rechtaan Creatief

0	0	0	0	0	0	0

Innovatief Ouderwets

0	0	0	0	0	0	0

Voorspelbaar Verrassend

Afbeelding 3 is:

0	0	0	0	0	0	0

Rechttoe-rechtaan Creatief

0	0	0	0	0	0	0

Innovatief Ouderwets

0	0	0	0	0	0	0

Voorspelbaar Verrassend

Afbeelding 4 is:

0	0	0	0	0	0	0

Rechttoe-rechtaan Creatief

0	0	0	0	0	0	0

Innovatief Ouderwets

0	0	0	0	0	0	0

Voorspelbaar Verrassend

Afbeelding 5 is:

0	0	0	0	0	0	0

Rechttoe-rechtaan Creatief

0	0	0	0	0	0	0

Innovatief Ouderwets

0	0	0	0	0	0	0

Voorspelbaar Verrassend

Geef in de volgende vragen aan hoe makkelijk of moeilijk je de afbeelding te begrijpen vindt.

Afbeelding 1

Afbeelding 2

Afbeelding 3

Afbeelding 4

Afbeelding 5

Afbeelding 1 is:

0 0 0 0 0 0 0

Makkelijk te begrijpen Moeilijk te begrijpen

Afbeelding 2 is:

0 0 0 0 0 0 0

Makkelijk te begrijpen Moeilijk te begrijpen

Afbeelding 3 is:

0 0 0 0 0 0 0

Makkelijk te begrijpen Moeilijk te begrijpen

Afbeelding 4 is:

0 0 0 0 0 0 0

Makkelijk te begrijpen Moeilijk te begrijpen

Afbeelding 5 is:

0 0 0 0 0 0 0

Makkelijk te begrijpen Moeilijk te begrijpen

Bekijk nogmaals de onderstaande advertenties. Geef vervolgens antwoord op de onderstaande vragen, maar nu over de vijf advertenties gezamenlijk.

Afbeelding 1

Afbeelding 2

Afbeelding 3

Afbeelding 4

Afbeelding 5

Ik begrijp de boodschap die in de bovenstaande advertenties wordt gecommuniceerd:

0 0 0 0 0

Helemaal niet Helemaal

Leg kort in je eigen woorden uit wat de boodschap van de advertenties is.
……

Ruimte voor aanvullende opmerkingen
……

In de advertenties wordt een vergelijking gemaakt tussen twee objecten. Koffie wordt vergeleken met een wekker. Geef aan wat je van de vergelijking vindt.

De gemaakte vergelijking is:

Oud Nieuw
0 0 0 0 0 0 0

Ongebruikelijk Gebruikelijk
0 0 0 0 0 0 0

Logisch Onlogisch
0 0 0 0 0 0 0

De twee objecten ‘koffie’ en ‘wekker’ zijn:

Gelijk						Ongelijk
0	0	0	0	0	0	0
Verschillend						Niet verschillend
0	0	0	0	0	0	0
Niet verwant						Verwant
0	0	0	0	0	0	0

In alle vijf advertenties wordt dezelfde metafoor toegepast. Komt deze in alle versies even goed naar voren?

Afbeelding 1

Afbeelding 2

Afbeelding 3

Afbeelding 4

Afbeelding 5

In afbeelding 1 komt de metafoor:

Onduidelijk naar voren						Duidelijk naar voren
0	0	0	0	0	0	0

In afbeelding 2 komt de metafoor:

Onduidelijk naar voren						Duidelijk naar voren
0	0	0	0	0	0	0

In afbeelding 3 komt de metafoor:

Onduidelijk naar voren						Duidelijk naar voren
0	0	0	0	0	0	0

In afbeelding 4 komt de metafoor:

Onduidelijk naar voren						Duidelijk naar voren
0	0	0	0	0	0	0

In afbeelding 5 komt de metafoor:

Onduidelijk naar voren Duidelijk naar voren
0 0 0 0 0 0 0

Wanneer je vindt dat de metafoor in één of meer advertenties minder goed naar voren komt, waar ligt dit volgens jou dan aan? Geef dit kort aan per afbeeldingsnummer(s). Noteer anders "n.v.t." om verder te gaan.

……

De merknaam Il'Gusta Coffee verwijst naar koffie.

0 0 0 0 0 0 0
Onduidelijk Duidelijk

Als jij de ontwerper van de advertenties zou zijn, wat zou jij dan anders doen?

……

Hier worden alle stappen herhaald voor de andere metaforen.

Je bent bijna klaar! Graag willen we alleen nog wat basis achtergrondinformatie.

Geslacht:

- ❑ Man
- ❑ Vrouw

Leeftijd:

……

Hoogst genoten opleiding:

- ❑ Basisschool
- ❑ Middelbaar onderwijs
- ❑ MBO
- ❑ HBO
- ❑ WO
- ❑ Anders

Appendix B – Results pre-test

Stimulus	Conventionality *M* (*SD*)	Comparability *M* (*SD*)	Perceived comprehension *M* (*SD*)	Actual comprehension	Brand name fit *M* (*SD*)
Coffee	4.75 (1.57)	3.88 (1.49)	3.89 (1.20)	63% correct	6,32 (1.45)
Detergent	5.41 (1.53)	4.25 (1.21)	4.16 (0.77)	89% correct	4,95 (2.09)
Suitcase	4.09 (1.63)	4.28 (1.43)	3.79 (1.13)	89% correct	6,42 (.69)
Sunglasses	3.09 (1.55)	3.53 (1.66)	3.79 (1.36)	73% correct	6,63 (.83)
Toilet freshener	5.88 (1.26)	4.12 (1.47)	4.37 (0.60)	89% correct	6,53 (1.22)
Matrass	5.56 (1.30)	3.95 (1.60)	4.21 (0.79)	84% correct	6,63 (.60)
Sports shoes	4.48 (1.61)	3.73 (1.45)	4.50 (0.69)	85% correct	5,90 (.1.59)
Toothpaste	4.78 (1.56)	3.02 (1.58)	4.15 (1.04)	90% correct	6,40 (.88)
Tissues	4.15 (1.48)	3.63 (1.30)	3.65 (1.23)	75% correct	5,65 (1.66)
Tea	2.72 (1.84)	2.71 (1.78)	2.55 (1.40)	45% correct	6,45 (1.23)
Duster	5.35 (1.67)	4.08 (1.60)	4.10 (1.02)	90% correct	5,80 (1.70)
Smartphone	2.80 (1.66)	2.63 (1.69)	3.05 (1.54)	55% correct	6,20 (1.40)
Pencil	2.63 (1.79)	2.05 (1.44)	1.79 (1.13)	37% correct	6,32 (.89)
Camera	2.81 (1.52)	2.91 (1.76)	3.16 (1.46)	73% correct	6,53 (1.02)
Lollipop	5.23 (1.26)	3.58 (1.51)	4.05 (0.97)	42% correct	6,26 (1.52)
Condom	3.56 (1.56)	4.07 (1.49)	3.89 (1.20)	79% correct	6,84 (.50)
Deodorant	4.77 (1.56)	5.14 (.90)	3.74 (0.99)	84% correct	6,79 (.42)
Energy bar	5.47 (1.24)	4.44 (1.39)	4.53 (0.61)	79% correct	6,16 (1.42)
Blond beer	2.11 (1.04)	2.04 (1.00)	2.32 (1.34)	26% correct	6,53 (1.02)

Conventionality, comparability, and brand name fit measured on a 7-point scale
Perceived comprehension measured on a 5-point scale
Actual comprehension measured through coding open answers and analysing frequencies

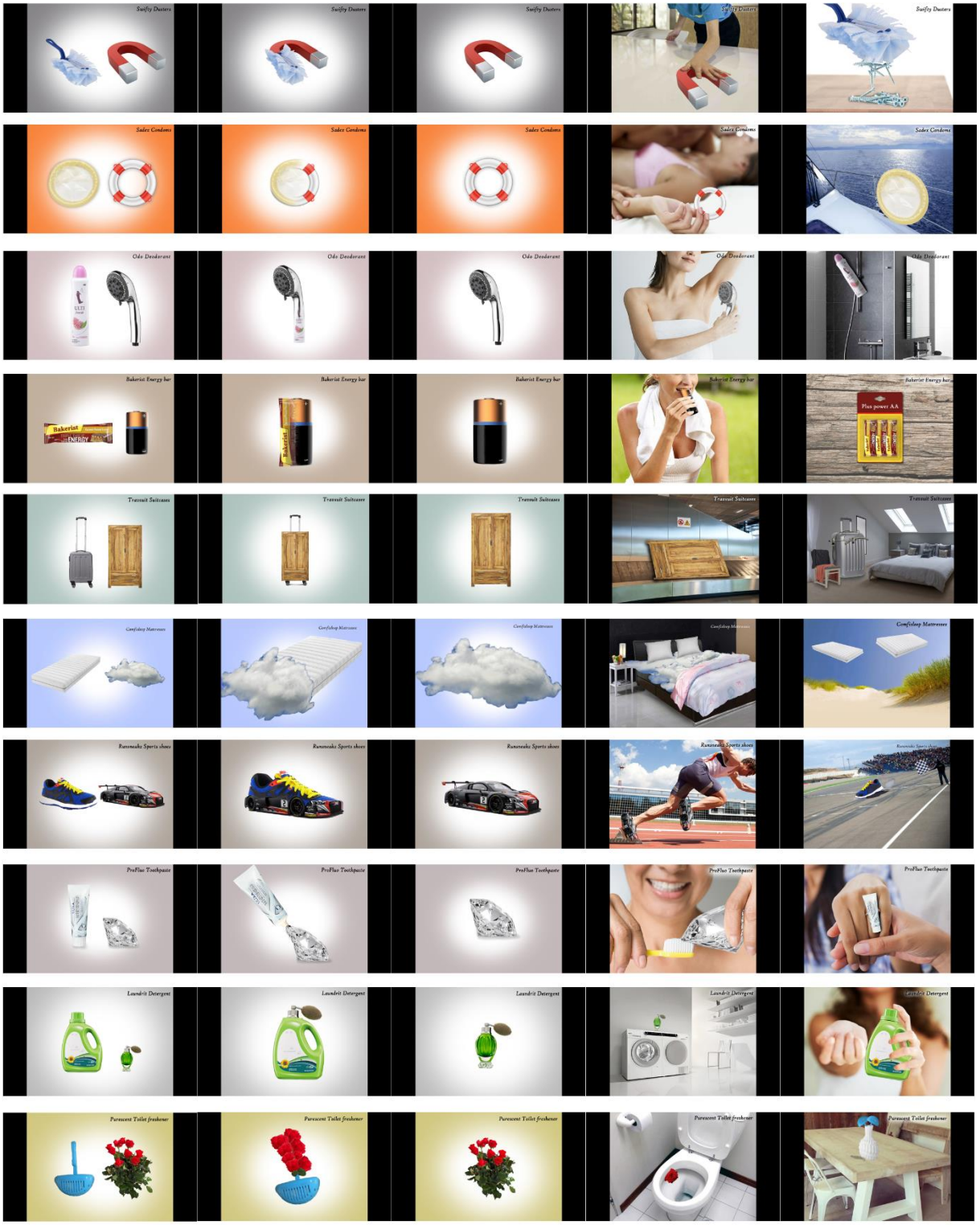
Metaphor structure	**Artful deviation** ***M*** **(*SD*)**	**Complexity** ***M*** **(*SD*)**
Juxtaposition	2.71 (.94)	2,89 (1.30)
Fusion	4.62 (.98)	2,96 (1.03)
Replacement	2.38 (1.11)	4,77 (1.53)
Target Replacement	4.76 (.87)	3,81 (1.03)
Context Replacement	5.02 (.84)	4,21 (1.12)

Means taken from overall metaphors to investigate not the different structures but the metaphorical message in general. Light grey results indicate insufficient findings for actual comprehension. Based on these numbers, advertisements for coffee, sunglasses, tea, smartphone, pencil, camera, lollipop, and blond beer got eliminated and were not used in the actual experiment. For the leftover products, alterations were made where necessary, for instance for brand name fit for detergent.

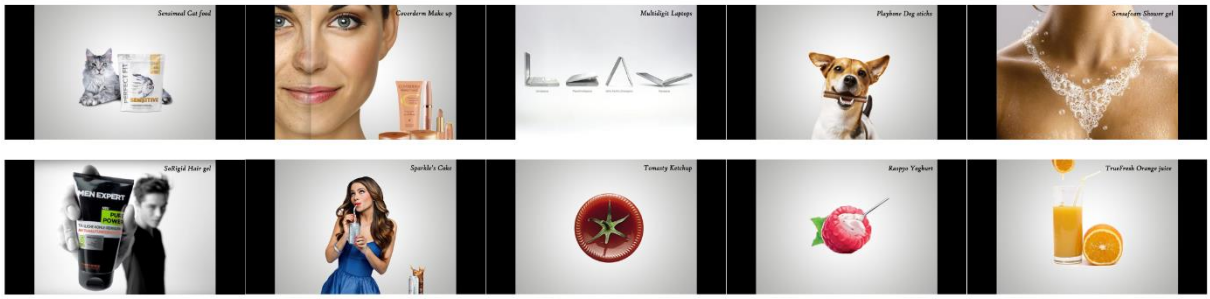
In order to ensure the five different structures deviated in means of creativity and complexity as intended, overall means were calculated and inspected. As intended, Juxtapositions and Replacements were perceived as less creative and the two forms with context scored highest. For complexity, the intended pattern was also observed, indicating the structures suffice to the guidelines as set for the actual experiment. See the table above for all means and standard deviations.

Appendix C – Stimuli

Metaphorical advertisements



Fillers


Sensimeal Cat food
Cocoderm Make up
Multidigit Laptops
Playbone Dog sticks
Sensafoam Shower gel
Softigid Hair gel
Sparkle's Coke
Tomasty Ketchup
Kaypo Yoghurt
TrueFresh Orange juice

Appendix D – Questionnaire experiment (in Dutch)

Hartelijk welkom!

Je krijgt zo meteen verschillende advertenties te zien.
We willen je vragen om deze advertenties te beoordelen.

INFORMATIE OVER DE PROCEDURE VAN HET EXPERIMENT:

Voorafgaand aan iedere advertentie verschijnt een kruisje, kijk daarnaar.

Daarna krijg je de advertentie te zien, op de plek waar het kruisje stond.
Het kruisje helpt je dus om je te oriënteren.

Vervolgens krijg je zwart-witte ruis te zien.

Daarna krijg je enkele vragen over de advertentie.

UITLEG VOOR HET BEANTWOORDEN VAN DE VRAGEN

Ga bij het beantwoorden van de vragen uit van je eigen mening.

Er zijn geen goede of foute antwoorden.

Bij de meeste vragen is een schaal te vinden die uit 7 cijfers bestaat.

Het is de bedoeling dat je het cijfer kiest dat je eigen mening het beste weergeeft.

Zie de voorbeeldvraag hieronder.

Voorbeeld:

Ik vind de advertentie
Heel mooi 1---2---3---4---5---6---7 Heel lelijk

Druk het cijfer in dat overeenkomt met je mening.
Daarna verschijnt er een volgende vraag.

Nu volgt een oefening.

DRUK OP EEN TOETS OM DE OEFENING TE STARTEN

kruisje

afbeelding

ruis

Nu volgen er enkele GESLOTEN vragen over de advertentie die je zojuist zag.

Druk het cijfer in dat overeenkomt met je mening.

Ik vind het afgebeelde in de advertentie:

Lelijk	1---2---3---4---5---6---7	Mooi
Onaantrekklijk	1---2---3---4---5---6---7	Aantrekkelijk
Vervelend om naar te kijken	1---2---3---4---5---6---7	Aangenaam om naar te kijken
Niet prettig om te zien	1---2---3---4---5---6---7	Prettig om te zien
Niet fijn om naar te kijken	1---2---3---4---5---6---7	Fijn om naar te kijken

Ik vind het afgebeelde in de advertentie saai.

Helemaal mee oneens	1---2---3---4---5---6---7	Helemaal mee eens

Ik vind het afgebeelde in de advertentie plezierig.

Helemaal mee oneens	1---2---3---4---5---6---7	Helemaal mee eens

Ik vind het afgebeelde in de advertentie interessant.

Helemaal mee oneens	1---2---3---4---5---6---7	Helemaal mee eens

Ik vind het afgebeelde in de advertentie onplezierig.

Helemaal mee oneens	1---2---3---4---5---6---7	Helemaal mee eens

Ik vind het afgebeelde in de advertentie verwarrend.

Helemaal mee oneens	1---2---3---4---5---6---7	Helemaal mee eens

Ik vind het afgebeelde in de advertentie:

Slecht herkenbaar	1---2---3---4---5---6---7	Goed herkenbaar
Moeilijk te begrijpen	1---2---3---4---5---6---7	Makkelijk te begrijpen

Nu volgt er een OPEN vraag over de advertentie die je zojuist zag.

Vul het antwoord in en druk op {ENTER} om verder te gaan.

Voor welk product was deze advertentie?

Leg kort in je eigen woorden uit wat de advertentie over dit product wil zeggen.

Nadenken over wat ik heb gezien vond ik:
Niet leuk 1---2---3---4---5---6---7 Leuk

Proberen de boodschap van de advertentie te achterhalen vond ik:
Niet leuk 1---2---3---4---5---6---7 Leuk

Dit was de oefening.

Heb je nog vragen? Dan kun je ze NU stellen aan de proefleider!

DRUK OP EEN TOETS OM HET EXPERIMENT TE BEGINNEN…

Herhaling van alle vragen voor alle afbeeldingen

Appendix E – Reliability scores for scales (Cronbach's Alpha)

Advertisement	Aesthetic pleasure	Felt fluency	Processing pleasure
J_1	.904	.828	.928
J_2	.945	.796	.931
F_1	.955	.859	.936
F_2	.962	.897	.943
R_1	.937	.727	.920
R_2	.956	.751	.928
TR_1	.944	.887	.953
TR_2	.953	.868	.951
CR_1	.943	.864	.957
CR_2	.945	.873	.961

Appendix F – Output MEMORE

Exposure time	Metaphor structures	Path a_1	Path a_2	Path a_3	Path b_1	Path b_2	Path c'
100ms	F-J	b = .50, t(80) = 2.73, p = .01, CI [.13;.87]	b = .22, t(78) = 2.02, p = .05, CI [.0031;.43]	b = .33, t(78) = 5.23, p < .001, CI [.20;.45]	b = -.07, t(76) = -.8562, p = .39, CI [-.24;.09]	b = .25, t(76) = 1.88, p = .06, CI [-.01;.51]	b = .17, t(76) = 1.29, p = .20, CI [-.09;.42]
	R-J	b = -.70, t(80) = -3.13, p = .003, CI [-1.15;-.26]	b = .80, t(78) = 6.16, p < .001, CI [.54;.1.06]	b = .42, t(78) = 6.80, p < .001, CI [.29;.54]	b = .18, t(76) = 2.20, p = .03, CI [.02;.34]	b = .18, t(76) = 1.52, p = .13, CI [-.06;.42]	b = -.09, t(76) = -.54, p = .59, CI [-.42;.24]
	TR-J	b = -.05, t(80) = -.25, p = .80, CI [-.44;.34]	b = .30, t(78) = 2.21, p = .03, CI [.03;.57]	b = .39, t(78) = 5.08, p < .001, CI [.24;.55]	b = .16, t(76) = 2.55, p = .01, CI [.04;.29]	b = .10, t(76) = 1.26, p = .21, CI [-.06;.26]	b = -.35, t(76) = -3.67, p < .001, CI [-.55;-.16]
	CR-J	b = .54, t(80) = 2.63, p = .01, CI [.13;.94]	b = .35, t(78) = 2.63, p = .01, CI [.08;.61]	b = .29, t(78) = 4.22, p < .001, CI [.16;.43]	b = .01, t(76) = .18, p = .86, CI [-.12;.15]	b = .43, t(76) = 4.30, p < .001, CI [.23;.64]	b = -.40, t(76) = -3.22, p = .002, CI [-.64;-.15]
	R-F	b = -1.21, t(80) = -5.79, p < .001, CI [-1.62;.79]	b = .52, t(78) = 4.36, p < .001, CI [.28;.75]	b = .32, t(78) = 6.05, p < .001, CI [.22;.43]	b = -.03, t(76) = -.33, p = .74, CI [-.21;.15]	b = .48, t(76) = 3.07, p = .003, CI [.17;.78]	b = -.44, t(76) = -2.45, p = .02, CI [-.80;-.08]
	TR-F	b = -.55, t(80) = -3.14, p = .002, CI [-.90;-.20]	b = .09, t(78) = .80, p = .43, CI [-.15;.34]	b = .37, t(78) = 4.98, p < .001, CI [.22;.52]	b = .21, t(76) = 2.59, p = .01, CI [.05;.38]	b = .09, t(76) = .83, p = .41, CI [-.13;.31]	b = -.43, t(76) = -3.61, p < .001, CI [-.67;-.19]
	CR-F	b = .03, t(80) = .17, p = .86, CI [-.35;.42]	b = .11, t(78) = .92, p = .36, CI [-.13;.36]	b = .32, t(78) = 4.52, p < .001, CI [.18;.46]	b = .21, t(76) = 2.59, p = .01, CI [.05;.38]	b = -.01, t(76) = -.11, p = .91, CI [-.17;.16]	b = .37, t(76) = 3.14, p = .002, CI [-.69;-.19]
	TR-R	b = .65, t(80) = 3.53, p < .001, CI [.29;1.02]	b = -.46, t(78) = -3.73, p < .001, CI [-.70;-.21]	b = .34, t(78) = 4.97, p < .001, CI [.21;.48]	b = .23, t(76) = 2.60, p = .01, CI [.05;.41]	b = .29, t(76) = 2.30, p = .02, CI [.04;.54]	b = -.30, t(76) = -2.01, p = .05, CI [-.59;-.01]
	CR-R	b = 1.24, t(80) = 5.98, p < .001, CI [.83;1.65]	b = -.48, t(78) = -3.31, p = .001, CI [-.76;-.19]	b = .38, t(78) = 5.92, p < .001, CI [.25;.51]	b = .06, t(76) = .78, p = .44, CI [-.10;.23]	b = .51, t(76) = 4.20, p < .001, CI [.27;.75]	b = -.13, t(76) = -.78, p = .44, CI [-.45;.20]**
	CR-TR	b = .59, t(80) = 2.97, p = .004, CI [.19;.98]	b = .04, t(78) = .31, p = .76, CI [-.21;.29]	b = .32, t(78) = 4.69, p < .001, CI [.19;.46]	b = .09, t(76) = 1.17, p = .25, CI [-.06;.24]	b = .20, t(76) = 1.75, p = .09, CI [-.03;.42]	b = .07, t(76) = .53, p = .60 CI [-.18;.32]
5000ms	F-J	b = -.35, t(82) = -2.39, p = .02, CI [-.64;-.06]	b = -.03, t(80) = -.30, p = .76, CI [-.21;.15]	b = .13, t(80) = 1.95, p = .06, CI [-.00;26]	b = .30, t(78) = 2.85, p = .006, CI [.09;.51]	b = .46, t(78) = 2.69, p = .009, CI [.12;.81]	b = -.30, t(78) = -2.14, p = .04, CI [-.58;-.02]
	R-J	b = 1.41, t(82) = 7.58, p < .001, CI [1.04;1.78]	b = .34, t (80) = 2.10, p = .04, CI [.02;.66]	b = .16, t(80) = 2.19, p = .03, CI [.02;.31]	b = .05, t(78) = .65, p = .51, CI [-.10;.19]	b = .20, t(78) = 1.88, p = .06, CI [-.01;.41]	b = .01, t(78) = .06, p = .95, CI [-.30; .32]
	TR-J	b = .15, t(82) = .98, p = .33, CI [-.16;.47]	b = .12, t(80) = 1.41, p = .16, CI [-.05;.29]	b = .13, t(80) = 2.11, p = .04, CI [.01;.25]	b = .23, t(78) = 2.74, p = .008, CI [.06;.39]	b = .44, t(78) = 2.97, p = .004, CI [.14;.73]	b = -.31, t(78) = -2.67, p = .009, CI [-.54;-.08]
	CR-J	b = 1.12, t(82) = 6.67, p < .001, CI [.78;1.45]	b = .14, t(80) = 1.17, p = .25, [-.10;.37]	b = .14, t(80) = 2.25, p = .03, CI [.02;.27]	b = .11, t(78) = 1.30, p = .20, CI [-.06;.28]	b = .25, t(78) = 1.70, p = .09, CI [-.04;.54]	b = -.15, t(78) = -.99, p = .32, CI [-.46;.15]
	R-F	b = 1.76, t(82) = 9.20, p < .001, CI [1.38;2.14]	b = .23, t(80) = 1.36, p = .18, CI [-.11;.56]	b = .24, t(80) = 3.43, p = .001, CI [.10;.37]	b = .33, t (78) = 4.03, p < .001, CI [.17;.49]	b = .43, t(78) = 3.41, p = .001, CI [.18;68]	b = -.23, t(78) = -1.21, p = .23, CI [-.60;.15]
	TR-F	b = .50, t(82) = 3.25, p = .002, CI [.20;.81]	b = .13, t(80) = 1.82, p = .07, CI [-.01;.28]	b = .16, t(80) = 3.20, p = .002, CI [.06;.26]	b = .21, t(78) = 2.32, p = .02, CI [.03;.39]	b = .44, t(78) = 2.32, p = .02, CI [.06;.82]	b = .03, t(78) = .20, p = .84, CI [-.23;.28]
	CR-F	b = 1.47, t(82) = 8.85, p < .001, CI [.19;.76]	b = -.10, t(80) = -.73, p = .47, CI [-.39;.18]	b = .32, t(80) = 4.66, p < .001, CI [.18;.46]	b = .15, t(78) = 1.67, p = .10, CI [-.03;.34]	b = .55, t(78) = 4.16, p < .001, CI [.29;.81]	b = .05, t(78) = .32, p = .75, CI [-.28;.39]
	TR-R	b = -1.26, t(82) = -6.78, p < .001, CI [-1.62;-.89]	b = -.06, t(80) = -.41, p = .69, CI [-.34;.22]	b = .29, t(80) = 4.36, p < .001, CI [.16;.43]	b = .15, t(78) = 1.73, p = .09, CI [-.03;.33]	b = .41, t(78) = 3.10, p = .003, CI [.15;.67]	b = -.03, t(78) = -.19, p = .85, CI [-.36;.30]
	CR-R	b = -.29, t(82) = -1.64, p = .10, CI [-.65;.06]	b = -.21, t(80) = -1.94, p = .06, CI [-.43;.00]	b = .21, t(80) = 3.24, p = .002, CI [.08;.35]	b = .11, t(78) = 1.30, p = .20, CI [-.06;.27]	b = .43, t(78) = 3.30, p = .001, CI [.17;.68]	b = .00, t(78) = .01, p = .99, CI [-.25;.25]
	CR-TR	b = .96, t(82) = 5.59, p < .001, CI [.62;1.31]	b = -.06, t(80) = -.49, p = .62, CI [-.30;.18]	b = .22, t(80) = 3.33, p = .001, CI [.09;.35]	b = .01, t(78) = .12, p = .91, CI [-.15;.16]	b = .29, t(78) = 2.39, p = .02, CI [.05;.54]	b = .20, t(78) = 1.48, p = .14, CI [-.07;.47]