Butterflies And Bananas. An experimental study into the effects of (a)symmetry, order, and context on the interpretation of visually and verbally presented juxtaposed entities.

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Abstract

Juxtaposed entities, like *butterfly* and *dress* or *banana* and *bread*, invite people to look for meaningful connections between the entities. The connections people find could indicate an interpretation of comparison, like *'Bananas and bread are both edible'*. If an expression is interpreted metaphorically, like *'A dress is as beautiful as a butterfly'*, then a process of cross-domain mapping has found place. The type of interpretation one ends up with might depend on which of the object is most likely to be the topic (symmetry), the alignment of the objects (order), and the presence of verbal cues (advertising context). The present study investigated whether (a)symmetry, order, and context affect the interpretation of visually and verbally presented juxtaposed entities. No effects were found for order and modality, but the results showed some interesting findings for symmetry and context. All object pairs (e.g., *banana-bread*) were most likely to elicit interpretations of comparison, but asymmetrical object pairs (e.g., *butterfly- dress*) increased the chance of metaphorical interpretations. Adding contextual cues like a brand name and a product category increased the chance of cross-domain mapping even more.

Keywords: juxtaposition, symmetry, context, advertising, metaphor

General introduction

In our everyday lives we come across many forms of communication in which two objects or entities are placed next to each other. Think about environment activists who are showing images of the planet next to a melting ice cream, poets who write about a beloved one being as unpredictable as the tide, political cartoonists who depict a president next to a puppet, workers who talk about their bosses being slave drivers, and advertisers who create an advertisment showing a mountain bike next to a mountain goat. The entities that are involved in these messages do not seem to be related to each other at first sight, but because of their alignment perceivers tend to look for relevant connections between them. Placing entities next to each other, either verbally or visually, is called juxtaposition.

Juxtaposing two objects invites the perceiver to search for connections between the objects. *Why do I see these two objects? How are these two objects connected? Does one object say something about the other object?* Teng and Sun (2002) describe this search to connections between objects as 'image grouping hypothesis', which suggests that symmetric alignment could express a connection between the objects. Placing two images next to each other in a neutral setting without context and with similar size, orientation and/or distance, makes people look for meaningful connections or similarities. Because the two entities are derived from different categories, the alignment or juxtaposition first evokes feelings of contrast or dissonance. People tend to solve this cognitive dissonance between the two different objects (Teng and Sun, 2002; Schilperoord et al., 2009).

In some cases the juxtaposed entities are interpreted metaphorically, and are therefore called metaphors. A metaphor can be defined as a rhetorical form of communication in which one kind of thing is understood and experienced in terms of another (Lakoff & Johnson, 2008). People often use metaphors to talk about their feelings and experiences or to capture abstract concepts like love, war, ideas, time and illness. Examples are *'Ideas are plants'* (Lakoff & Johnson, 2008), *'Cancer is a teacher'* (Gibbs & Franks, 2002), and *'The future is ahead of us'* (Boroditsky, 2000). Imagine a wise old man saying *'ideas are plants'* to his grandson, who has trouble to come up with ideas for his school project. Just like plants, one has to feed ideas in order to let them grow big and beautiful. Someone who experiences cancer could express his or her feelings by saying that *'cancer is a teacher*', because people can learn from this disease in multiple ways. And in the expression *'the future is ahead of us'*, a spatial concept (being in front of something or someone, so visible) is used to understand the abstract concept of the future.

Metaphors consist of three parts: a target, a source and a ground (Lakoff, 1993). The target can be seen as the main topic of the communication, for instance someone's experience with cancer, a product in an advertisement, feelings of anger, or a certain person that is referred to. The source is the entity, object or domain of which specific characteristics or features have been derived from. These features can subsequently be attributed to the target in order to understand and experience the target in terms of the source. The ground at last consists of relevant characteristics or features that can be attributed to both the target and the source. If the expression *'Ideas are plants'* is interpreted metaphorically, then *'ideas'* serves as target, *'plants'* serves as source, and *'the need to be fed in order to grow'* serves as ground. The process of interpreting such messages metaphorically, i.e., searching for relevant connections between two entities from different domains, is called cross-domain mapping (Bowdle & Gentner, 2005; Romero & Soria, 2013).

All forms of communication require knowledge about common events, language, symbols, concepts, and conventions. Also cross-domain mapping and subsequent metaphorical interpretations depend on someone's cultural, regional and social background. Differences in value systems, historical and emotional experiences, codes of conduct, and perspectives on time, space, power and structure can all lead to divergent metaphorical interpretations (Deignan, 2003; Kövecses, 2010; Littlemore, 2003; Hegarty, 2011).

Besides verbal metaphors, there is a lot of interest in the use of visual or pictorial metaphors as well (Forceville, & Urios-Aparisi, 2009), for instance in films (e.g., Carroll, 1996) and editorial cartoons (e.g., Schilperoord & Maes, 2009). Another domain is the world of advertising, where visual metaphors can be used to attract consumers' attention because of their creative deviation (e.g., Forceville, 1996; Gkiouzepas & Hogg, 2011; Indurkhya & Ojha, 2017; Lagerwerf & Meijers, 2008; Philips & McQuarrie, 2002; Schilperoord, forthcoming; Tom & Eves, 1999; Van Enschot & Hoeken, 2015; Van Mulken, Van Hooft & Nederstigt, 2014; Van Weelden, Maes, Schilperoord & Cozijn, 2011).

An example of a visual or pictorial message that could lead to a metaphorical interpretation in an advertising context is given in Figure 1. In this advertisement the intended target of the communication is a high speed train of the Spanish national railway company Renfe Operadora. An image of the train has been juxtaposed next to an image of an eagle's head. The text in the right upper corner of the advertisement says; *'The best way to protect nature is by imitation. The frontal design inspired by the eagle head makes the train 25% more energy-efficient.'* The advertisers want to emphasize the train's energy-efficiency as a result of the streamlined form of the train's front. The streamlined form (ground) that is used

in the frontal design of the train (target) has been inspired by the form of an eagle's head (source). In order to end up with the metaphorical interpretation of the ad's message (*'the train is an eagle'*), it is crucial that all three elements can correctly be identified, connected, and comprehended.

Figure 1. Advertisement for Renfe (March, 2009)

In the verbal expression *'writing a thesis is (like) climbing a mountain'*, the speaker relates two different entities with each other by means of the word(s) *'is (like)'*. By placing *'writing a thesis'* at the beginning of the expression, the speaker could communicate to the perceiver that this first part is the topic or subject of the message. In case of a metaphorical interpretation, *'writing a thesis'* serves as target, and *'climbing a mountain'* serves as source of which some characteristics have been chosen to relate to the target; i.e., both things are challenging and with obstacles, but with a lot of satisfaction in the end.

The expression *'A is (like) B'* does not always result in cross-domain mapping and metaphorical interpretations. Messages with two juxtaposed entities could also be interpreted as comparison (e.g., *'An energy drink is like a battery'*), categorization (e.g., *'A swan is an animal'*), or identity (e.g., *'My sister is a nurse'*). In general, people tend to interpret the left element of such expressions as the topic of the message and the right element as the predicate, i.e., the entity that gives information that can be related to the topic (Chiappe, Kennedy &

Smykowski, 2003). In all the example sentences above, the first entity serves as topic or subject, but the connections between the topic and the predicate are different.

In visual expressions though, a fixed topic or subject seems absent because there is no grammatical structure like in verbal expressions. Indurkhya and Ojha (2017) argue that the absence of the explicit copula *'is (like)'* in visual metaphors results in a more symmetrical interpretation for visual metaphors as compared to verbal metaphors. A pair of objects (*a* and *b*) is symmetrical if both objects are suitable to serve as topic. In visual messages where two entities are juxtaposed, like in Figure 1, neither object *a* or object *b* seems to be 'grammatically' fixed as the topic or subject of the message. Therefore perceivers could identify object *a* about as often as object *b* to serve as topic (a = b). However, because of their symmetric alignment, juxtaposed images also contain a so called "left-right order", which might express a fixed topic in the same way verbal expression do.

If perceivers indeed engage in cross-domain mapping, they have to decide which entity or object is the target, which object is the source, and which ground is relevant for the message (Forceville, 1996). In the case of the advertisement for Renfe's high speed train (Figure 1) it would not be profitable for the railway company when perceivers identify the eagle as topic, leading to an interpretation of the ad as an advertisement for preservation of threatened birds that are having a hard time because they are often hit by trains. In Figure 1 an informative context actually has been given, so perceivers would probably identify the *train* as topic of the message. It is of crucial importance that consumers can correctly identify the entities in an advertisement and that they end up with the intended metaphorical meaning.

Especially for visual expressions it would be interesting to study the effects of order on the interpretation of the juxtaposed entities. In verbal expressions the left entity most often serves as topic or subject, as fixed by the speaker because it has been placed at the beginning of the expression. If the verbal grammar of a "left-right order" functions as a comparable type of grammar in visual expressions, then the left entity within visual symmetrical object pairs would be identified as topic more often than the right entity.

Metaphors in advertising

To attract consumers' attention, advertisers pay a lot of attention to the design of the ads for their products or services. The use of rhetorical figures like schemes and tropes in advertisements is a popular way to attract the desired attention, because it deviates from the expected form and content in a creative and artistic way. Schemes deviate from the expected form of the message. Examples are the use of alliteration, e.g., brand names like *Coca Cola*,

Dunkin' Donuts, and *Minute Maid*, the use of a tricolon, e.g., an old slogan for the car brand Chevrolet: *'Eye it, try it, buy it'*, and rhyme, e.g., brand names like *Fitbit* and *7-Eleven*. Tropes on the other hand, deviate from the expected content of the message. Examples are the use of puns, e.g., a slogan for British Airways: *'Didn't sleep last flight? Fly Club World: more beds, more places, more sleep'*, and the use of metaphors, e.g., a slogan for Tropicana's orange juice: *'Your daily ray of sunshine'*. The printed ads of the slogans for British Airways and Tropicana are given in Figure 2 and Figure 3. In the printed advertisement of British Airways another trope is present as well; personification. The windows of the plane resemble half closed eyes from a person that needs some sleep.

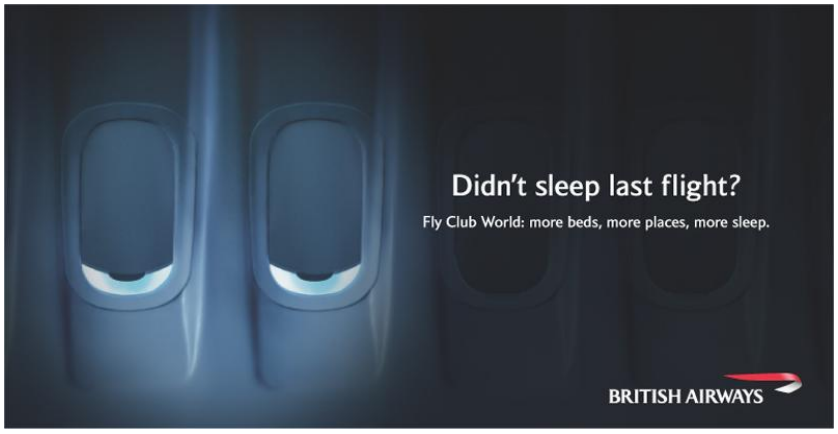


Figure 2. Advertisement for British Airways (September, 2005)

Figure 3. Advertisement for Tropicana (February, 2011)

Metaphors can be expressed by means of different visual structures. Philips and McQuarrie (2004) differentiate between three types of structures in which target and source can visually be displayed, i.e., juxtaposition (target and source displayed next to each other), fusion (target and source displayed in one image), and replacement (only the source has been displayed, the target is absent). Complexity increases from juxtaposition to replacement because of the growing demands regarding conceptual processing. Because advertisements are designed to attract attention and to persuade people to buy the products, a rich and promising research domain has focused to the appreciation of metaphors in advertisements, often including different visual structures (e.g., Forceville, 1996; Gkiouzepas & Hogg, 2011; Indurkhya & Ojha, 2017; Lagerwerf & Meijers, 2008; Philips & McQuarrie, 2004; Tom & Eves, 1999; Van Enschot & Hoeken, 2015; Van Mulken, Le Pair & Forceville, 2010; Van Mulken et al., 2014).

In the present study the main focus will not be on the appreciation, but instead on the interpretation and comprehension of juxtaposed entities as affected by different types of cues. Knowledge of cues that could lead to metaphorical interpretations of juxtaposed entities will

contribute to the rich research domain of juxtaposed objects in advertisements, as well as in other domains like poetry, art and ordinary communication.

Metaphors as part of the internal representation

Although the existing literature and studies discussed in the present paper definitely contribute to the interesting research area of metaphors, there exists a common misconception that metaphors are the expressed messages. Many researchers approach metaphors as being verbal or visual expressions used to describe something in terms of another. In contexts of political cartoons, art, poetry, and advertisements, verbal or visual messages are indeed often created to be interpreted metaphorically. Albeit, 'being a metaphor' is not part of the message itself, but rather of the interpretation that is made in the mind of the perceiver of this message (Schilperoord, forthcoming). For example; a cartoonist could draw a king placed next to a donkey to express a metaphorical connection (e.g., *'The king is a (dumb) donkey'*), but if the perceivers of this cartoon do not interpret the drawing metaphorically, then it is not a metaphor.

Hegarty (2011) describes external visual representations of related entities as iconic displays, in which the space between the depicted entities refers to the space between the conceptual referents of these entities. Entities that are depicted close to each other in the iconic display are therefore likely to be interpreted as closely related. This visual structure of presenting two objects next to each other, with little space between them, may elicit metaphorical interpretation.

By means of a diagram consisting of the different representations and processes that are involved in understanding visual displays, Hegarty (2011) explains how perceivers comprehend such displays. The diagram as taken from the article written by Hegarty (2011) can be seen in Figure 4. We take the visual display of the images of a dress and a butterfly (see Figure 5) as an example to apply the diagram.

The process starts with the external display, for instance with the juxtaposition of the dress and the butterfly as depicted in Figure 5. This external display is the same for each perceiver. Sensory processes lead perceivers to certain visual features of the display (entities, colours, shapes, <u>order</u> of the entities, height, and orientation). Which visual features are actually perceived, depends on one's sensory processes and on different goals or interactions with the display. Once the visual features are encoded the perceiver constructs an internal representation of the display, including display conventions such as knowledge about typical advertisements (<u>context</u>). This knowledge is defined as the display schema.

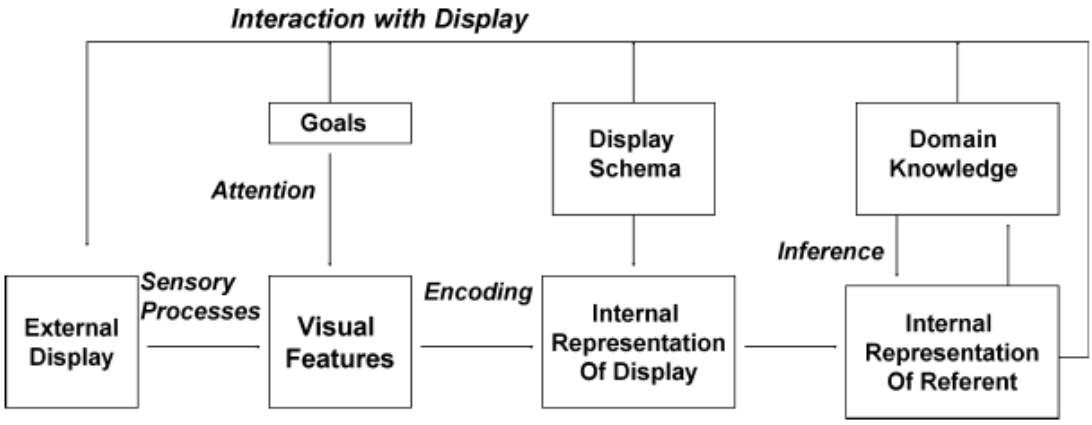


Figure 4. Diagram of the different representations and processes that are involved in understanding visual displays, copied from Hegarty (2011).

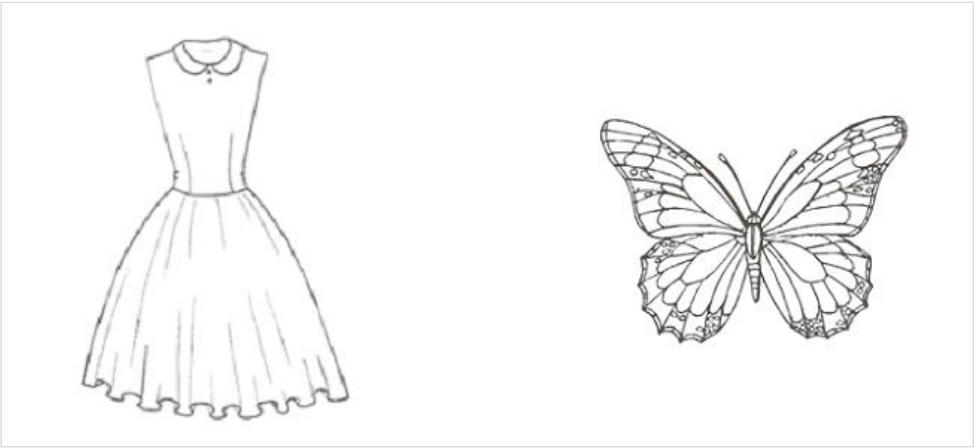


Figure 5. Example to explain the diagram in Figure 4. Visual iconic display of a dress and a butterfly.

The last process involves ending up with an internal representation of the referents, i.e. bathrobes and feathers in the real world. Understanding the visual display therefore requires inferences related to domain knowledge (both entities are soft and light) and visual-spatial processes (What is the relationship between these entities? Which entity is most likely to be the topic of this message? (symmetry)). These inferences are internal and not explicitly represented in the external visual display. If the perceiver is able to make these inferences, in this case resulting in a metaphorical interpretation *('this dress is as elegant and graceful as a butterfly*), then we have an example of a metaphor.

Based on the explanation as given by Hegarty (2011) and our own reflections, we prefer to not consider metaphors as external displays referring to entities, but rather as a conceptual representation that could comprehend incongruities, e.g., two juxtaposed objects that come from different domains (Schilperoord, forthcoming). We are fully aware of the sensitivity of this statement, and the current paper is not the suitable place to debate the true

nature of metaphors in further detail. Therefore, we decided to discuss the theories and findings from the existing literature using the original terms and definitions from these articles and studies. Though, as it comes to the material, methods, results, and discussions in the present study, we consider a metaphor as being part of people's internal representation, rather than part of the expression itself.

Cues that could elicit metaphorical interpretation

Symmetric object alignment, i.e., creating metaphorical or associative connections between objects, has also been studied by Schilperoord, Maes and Ferdinandusse (2009). The researchers demonstrate that aligment of juxtaposed objects can be accomplished by means of cues like shape, size, colour, and orientation (Schilperoord et al., 2009). Van Weelden (2013) investigated to what extent similarity of shape between entities in visual metaphors affects the processing of these metaphors. She found that similarity in shape increased the chance that metaphorical connections between two objects from different domains were found, indicating that perceptual features of objects seem to play an important role in the conceptual processing of visual metaphors. The present study focuses on other cues than similarity in shape, though it was made sure that all images were practially similar in size, colour (black and white) and orientation (facing the same direction) in order to provoke symmetric object aligment. The cues that are researched in the present study are (a)symmetry, order and context. Modality, presenting the object pairs either visually or verbally, serves as an additional factor.

(A)symmetry

In a study conducted by Indurkhya and Ojha (2017), participants were asked about their interpretation of presented visual metaphors. For most metaphors, the participants interpreted one of the objects as target and the other as source. However, for some metaphors participants' answers indicated an interpretation of comparison between the two objects. Based on their findings, Indurkhya and Ojha (2017) made a distinction between asymmetrical metaphors and symmetrical metaphors, arguing that symmetry of metaphor depends on characteristics of the images and on the knowledge of the perceiver. The materials of the study conducted by Indurkhya and Ojha (2017) only included object pairs in which one of the objects was more likely to be interpreted as topic. In the present study symmetrical object pairs will be included as well, resulting in two different types of object pairs. A pair of objects *a* and *b* is:

- **Symmetrical,** if both objects can be interpreted as topic → *a* is (like) *b* and *b* is (like) *a* (e.g., *'orange is bread'* and *'bread is orange'*);
- **Asymmetrical,** if one of the objects is more likely to be interpreted as topic than the other → *a* is (like) *b* > *b* is (like) *a* (e.g., *'train is eagle'* versus '*eagle is train'*).

In the symmetrical pair (*orange, bread*) the objects *orange* and *bread* share a ground, i.e., both objects belong within the category of everyday food that is perceived as healthy and nutritious. Although we will end up with slightly different meanings depending on which of the two objects is interpreted as topic (e.g., *'bread is as healthy as orange'* versus *'orange is a nutritious as bread'*), the possible connections between the two entities can be called symmetrical because both objects could easily serve as topic. It does not matter which object is interpreted as topic; in both cases the ground is relatively easy to come up with.

In the asymmetrical pair (*train, eagle*) on the other hand, the possible connections relate to different grounds (e.g., *'train is as streamlined as an eagle'* versus *'eagle is as solid as a train'*). It is much easier to interpret *train* as topic and to imagine a ground that has been derived from the features of an *eagle*, i.e., being streamlined, than to interpret *eagle* as topic and to come up with a ground that relates to the characteristics of a *train*.

Order

Juxtaposing entities, either verbally or visually, means placing two entities in a certain order. When perceiving verbal messages in which two entities are juxtaposed, people tend to interpret the left entity as the topic of the message and the right element as the entity that gives information that can be related to the topic (Chiappe et al., 2003). Reversal of target and source in verbal metaphors, i.e., the source named first, resulted in a decrease of comprehensibility and interpretability of the metaphor (Chiappe et al., 2003). A for visual juxtapositions, Kress and Van Leeuwen (2006) describe a distinction between the 'given' and the 'new' in images placed next to each other. The left image is the 'given', the familiar topic of the message, and the right image is the 'new', which gives more information about the 'given' (Kress & Van Leeuwen, 2006).

In the study conducted by Indurkhya and Ojha (2017) it was investigated whether placing target and source elements either left or right in visual metaphors would affect the interpretation of the metaphor. Participants were able to identify most of the targets and sources of the metaphors, independent of the order in which both domains were presented. The researchers state that these results might be due to background knowledge of the participants, i.e., that it is more likely to consider a guitar as target and an atomic explosion as

source, and not the other way around. They concluded that order did not play a role in the interpretation of target and source in metaphors. However, as noticed before, the materials of the study conducted by Indurkhya and Ojha (2017) only included object pairs in which one of the objects was more likely to be interpreted as topic, i.e., asymmetrical object pairs. When both objects are suitable to be the topic of communication, i.e., symmetrical object pairs, order might do play a role. Because juxtaposed entities are frequently used in advertisements, the present study focuses on objects that are likely to appear in advertisements, i.e., consumer goods. For asymmetrical pairs, natural objects like feathers, and uncommon tools like hand grenades were juxtaposed with the consumer goods. This resulted in two possible orders of objects for each type of object pair, i.e., (a, b) and (b, a);

- **Symmetrical pair →** Consumer good (*a*) – consumer good (*b*);
- **Symmetrical pair →** Consumer good (*b*) – consumer good (*a*);
- **Asymmetrical pair →** Consumer good (*a*) – natural object/ uncommon tool (*b*);
- **Asymmetrical pair →** Natural object/ uncommon tool (*b*) – consumer good (*a*).

Juxtaposition suggests a physical relation of being "next to each other", with one entity placed left and the other placed right. This visual structure is most ideal to investigate whether the order of the entities, i.e., left or right, matters in interpreting the connection between the two objects. Therefore, in the present study the objects of the different object pairs will be depicted in juxtaposition.

Context

Many studies have shown the importance of context or verbal cues for the interpretation of visual communication and visual metaphors (Cohn, 2010; Refaie, 2003; Van Enschot & Hoeken, 2015). These studies have demonstrated that verbal cues could be beneficial in identifying the target and the source in both visual and verbal metaphors. Therefore, an advertising context will be added to the juxtaposed entities in Experiment 3 of the present study, by means of providing the participants with fictitious brand names and product categories.

Modality

In visual expressions there seems to be no grammatical structure like in verbal expressions, where the first object is often 'fixed' as topic (Chiappe, 2003). Indurkhya and Ojha (2017)

argue that the absence of the explicit copula *'is (like)'* in visual metaphors results in more chance of symmetrical interpretations for visual metaphors than for verbal metaphors. The present study will investigate the cues (a)symmetry, order and context for both visually and verbally presented object pairs, to see whether there is a difference in modality as for the elicitation of metaphorical interpretations.

In summary, the present study investigates different cues that could invite people to engage in cross-domain mapping, resulting in metaphorical interpretations. Whether or not connections between juxtaposed entities are interpreted metaphorically might depend on the symmetry of the objects, i.e., which of two objects is more likely to function as topic of communication (Indurkhya and Ojha, 2017). Another cue involves the order in which the entities are aligned, and that in turn might be comparable to the verbal grammar in which the first entity is more likely to be the fixed topic (Chiappe et al., 2003). The roles of order and symmetry will be researched without or within an advertising context. Context therefore is the third possible cue to elicit cross-domain mappings. The juxtaposed objects will be presented either visually or verbally, to gauge possible effects of type of modality as well.

Research Question

The research question of the present study is:

> To what extent do (a)symmetry, order and context affect the interpretation of verbally and visually presented juxtaposed entities?

Three experiments will be conducted to answer the research question. In all three experiments the independent variables **modality**, **(a)symmetry** and **order** will be included in the design. The variable **context** will be added in the third experiment.

Experiment 1 will mainly gauge the (a)symmetry of visually and verbally presented juxtaposed entities by asking participants which of two objects would be the best topic for an advertisement. Experiment 2 and Experiment 3 will further investigate the role of (a)symmetry and order on the interpretation of visually and verbally presented juxtaposed entities, without (Experiment 2) or within an advertising context (Experiment 3).

Since in the present study we hold on to the idea that 'being a metaphor' is not in the message, but rather in the perceivers' interpretation of the message, the stimuli that were used in the present study did not contain predetermined targets and sources. Rather, the stimuli contained objects that were either consumer goods, natural objects or uncommon tools;

- **Asymmetrical pair of objects:** object *a* is consumer good (e.g., *dress, hot sauce,* or *vacuum cleaner*), and object *b* is natural object (e.g., *butterfly*) or uncommon tool (e.g., *hand grenade,* or *tornado*);
- **Symmetrical pair of objects:** object *a* is consumer good (e.g., *tissue, perfume,* or *tea*), and object *b* is a consumer good as well (e.g., *pillow, detergent,* or *scarf*).

INPUT: INDEPENDENT VARIABLES (A, B)		**PROCESS**	**OUTCOME: DEPENDENT VARIABLES**
Modality	verbal / visual	'comparison'	[A IS LIKE B] [B IS LIKE A]
(As)symmetry	a > b / a = b		
Order	(a, b) / (b, a)	'cross-domain mapping'	[A IS B] [B IS A]
Context	given / not given		

Figure 6. Overview of present research study.

In the second and third experiment of the present study, symmetrical and asymmetrical object pairs (i.e., with the entities *a* and *b*) will be presented to participants. In Figure 6 an overview of the research's input, expected processes and expected types of output has been shown, as expected for Experiment 2 and Experiment 3.

The modality of input is either verbal, by means of simple nouns, or visual, by means of simple black and white drawings. Other independent variables are (a)symmetry, order and context. As for (a)symmetry, participants will be presented with symmetrical object pairs, i.e., where both objects could serve as topic, and with asymmetrical object pairs, i.e., where one of the objects is preferred over the other to serve as topic. As for order, participants will be presented with two different orders, i.e., (a, b) or (b, a). As for context, participants in the second experiment will not be provided with any context and will not be instructed that they have to keep an advertisement context in mind. Participants in the third experiment on the contrary, will be given a fictitious brand name and a product category, and will be told that they could consider the objects as if they were presented within an advertising context.

Participants will be asked to search for a connection between the two objects. The present study focuses on two types of cognitive processing and interpretation of the juxtaposed entities; cross-domain mapping and comparison. The letters A and B in the outcome column of Figure 6 refer to the internal representations of the perceived objects *a* and *b*. A process of comparison would result in an expected output indicating a focus on the comparison between the two objects, i.e., [A IS LIKE B] or [B IS LIKE A]. A process of cross-

domain mapping would lead to an expected output indicating a metaphorical interpretation, i.e., [A IS B] or [B IS A]. In the example of a dress and a butterfly, a metaphorical interpretation would be *'A dress is as elegant and graceful as a butterfly'.* Some cues might be advantageous in eliciting metaphorical interpretations. The present study investigates to what extent symmetry, order and context affect the way people interpret verbally and visually presented juxtaposed entities.

Experiment 1

Introduction

We live by metaphors, according to Lakoff and Johnson (2008). We perceive, structure and remember the world by means of making metaphorical connections in our minds, i.e., understanding and experiencing things in terms of other things (Lakoff & Johnson, 2008). As described by Lakoff and Johnson (2008), a metaphor combines reason and imagination, since metaphorical thought of understanding one thing in terms of another requires categorization and inferences of these things.

Some people might think that metaphors are like comparisons, but there is a difference. A grammatical distinction between metaphors and comparisons has been described by Bowdle and Gentner (2005). The copula of a metaphor has the form *'An X is a Y'*, while the comparative copula of a comparison has the form *'An X is like a Y'*. A metaphorical interpretation involves a categorization of both the source and the target in the same general category, as evoked by the source. An interpretation of comparison on the other hand, involves salient shared features of the source and the target, and therefore to another processing and comprehension strategy. Bowdle and Gentner (2005) refer to these connections between different copulas and strategies as 'grammatical concordance'.

A large number of juxtaposed object pairs will be presented to participants in Experiment 1. Dutch participants will be asked to choose which of the two objects would be the most suitable topic for an advertisement. None of these object pairs are metaphors or comparisons, but they might be able to elicit interpretations of comparison or metaphorical interpretations.

A study conducted by Chiappe et al. (2003) showed that people tend to interpret the left entity in verbal metaphors as the topic of the message, suggesting that this first entity is 'grammatically' fixed as topic. Likewise, Kress and Van Leeuwen (2006) define the left entity of juxtaposed objects as the 'given', and the right entity as the 'new' containing information

about the 'given'. If 'coming first' means being interpreted as topic, than this might also work for juxtaposed entities. The present study will investigate whether the "left-right order", where the left object is often fixed as topic in verbal expressions, also works for verbally and visually juxtaposed entities.

Experiment 1 will function as determination study. Based on participants' answers for the object pairs in the first experiment's questionnaire, a definitive distinction will be made between symmetrical and asymmetrical object pairs for Experiment 2 and Experiment 3.

In the first experiment participants will be presented with verbally or visually presented pairs of objects, and will be asked to answer the question: '*For which of these two objects could you advertise for best?'*. It is expected that object *a* will be chosen more often than object *b* in expected asymmetrical pairs, since it is unrealistic to advertise for natural products like butterflies and clouds, or for uncommon tools like hand grenades, bullets and atomic bombs. Since the objects in the expected symmetrical pairs will all be consumer goods and therefore both likely to appear in advertisements, it is expected that in these pairs object *a* will be chosen about as often as object *b*, or that participants will choose the answer option *'Both'*. Furthermore, it is expected that choosing a topic within expected symmetrical pairs will result in longer response times than choosing a topic within expected asymmetrical pairs. It is expected that the order of the objects might affect the choice of topic, especially for expected symmetrical pairs in which the left object will be interpreted as fixed topic (Chiappe et al., 2003). The hypotheses for Experiment 1 are as follows;

- Expected symmetrical object pairs will result in a choice for both objects;
- Expected asymmetrical object pairs will result in a choice for one of the objects;
- Order of objects will affect the choice of topic, especially for expected symmetrical object pairs (the object on the left is preferred over the object on the right as topic);
- Response times will be longer for expected symmetrical pairs than for expected asymmetrical pairs.

Methods

Materials

The materials for the first experiment consisted of 55 object pairs. 16 object pairs were expected to be interpreted as symmetrical, e.g., *orange-bread*, and 39 object pairs were expected to be interpreted as asymmetrical, e.g., airplane-swan. Most of the object pairs were invented by the researchers. Some pairs, e.g., *cigarette-bullet*, *airplane-swan*, *hot sauce-hand*

grenade, *car-rhino*, and *tire-octopus*, have been derived from real existing advertisements. Other object pairs have been derived from the material described in the dissertation written by Van Weelden (2013). The object pairs that were expected to be asymmetrical consisted of two objects, a consumer good and a natural object or uncommon tool. The object pairs that were expected to be symmetrical consisted of two objects, both consumer goods, of which it was more ambiguous which of the two objects would be best to serve as topic. An overview of all stimuli that were used in Experiment 1 can be found in Appendix I.

Pretest

In order to make sure that all images that were selected to be used as stimuli in the present study were identifiable, a pretest was conducted. The pretest questionnaire was made by means of the online programme Qualtrics. The entire questionnaire was in Dutch. Participants were presented with 100 images in a randomized order, and each image was accompanied by the question *'What is depicted here?'*. Participants were asked to write down in one or two words what they thought the image depicted, being as precise as possible.

Participants were recruited via social media and personal contacts of the researcher. They could open the questionnaire by means of a unique distribution link. Eleven participants completed the questionnaire that on average took 10 minutes to complete. The mean age of the participants was 23 years old (min. 19 - max. 25), and the male-female ratio was 18%-82%.

Based on the participants' answers some images were not included in the stimuli set that was used for Experiment 1. Examples of thrown out images are the images of a *woodpecker* (most of the participants thought the image depicted a 'bird', which is correct, but not precise enough), an *air fryer* (most of the participants could not identify this object), *lavender* and *mint* (most participants identified these herbs as plants, but were not able to be more precise about the type of herb), and *energy bar* (most of the participants could not identify this object). The images that were identified correctly by the participants were used as stimuli in Experiment 1, together with images that were already pretested in the studies by Van Weelden (2013), and with images of which it was already expected that they were identifiable, like *elephant* and *rhino*.

Participants

Participants were recruited via social media or were asked personally at the Radboud University in Nijmegen. In the end, 71 participants completed the questionnaire in Qualtrics.

Answers of 2 participants were deleted from the dataset before analyses, because these participants divided the questionnaire over two or more days and did not complete the questionnaire in one sitting. On average it took 4 minutes to complete the questionnaire. The mean age of the participants was 27 years old (range: 18 - 70), and the male-female ratio was 32%-68%. Some of the participants were German (*N* = 3), but because they were known by the researcher there was no doubt that their Dutch language skills were qualified enough to successfully understand and make the questionnaire. Participation in the experiment was voluntary and participants did not receive formal credits or another form of compensation. Though, all participants were given the opportunity to write down their email address at the end of the questionnaire for the chance to win a 10 euro gift card.

Design

The 2x2x2 design of Experiment 1 was a mixed design with **modality** as between factor (visual; verbal), and **expected symmetry** (symmetrical; asymmetrical) and **order of objects** ((a, b) or (b, a)) as within factors. The dependent variables were **response time** (measured in milliseconds), and **chosen topic** as best object to advertise for (left; right; both).

Instrumentation

Each of the 55 object pairs was accompanied by the following question: *'For which of these two could you advertise for best?'* (The original question was in Dutch: *'Voor welke van deze twee kun je het beste reclame maken?*'). On a horizontal three-point scale below each object pair participants could choose for '←', if they thought the object on the left was best to advertise for, or '*Both'*(In Dutch: *'Beide'*) if they thought both objects were equally able to be advertised for, or '→' if they thought the object on the right was best to advertise for. The answer option '←' was presented right below the image or word on the left, the answer option '→' was presented right below the image or word on the right, and the answer option 'Both' was presented in the middle. Response times for how long people spent on each question page were measured in milliseconds.

Procedure

The questionnaire could be opened by means of a unique distribution link. The entire questionnaire was in Dutch. When following the link to the questionnaire, participants were randomly assigned to either the questionnaire with object pairs depicted with words, or the questionnaire with object pairs depicted with images. Within both conditions of modality (i.e.,

words or images), there was a random assignment to one of two order lists. For instance, half of the participants in the words-condition (or images-condition) saw the object pair *cow-lawnmower*, and the other half of the participants in the words-condition (or images-condition) saw the same pair but in reversed order, *lawnmower-cow*. In Figure 7 the four different structures of one object pair are shown.

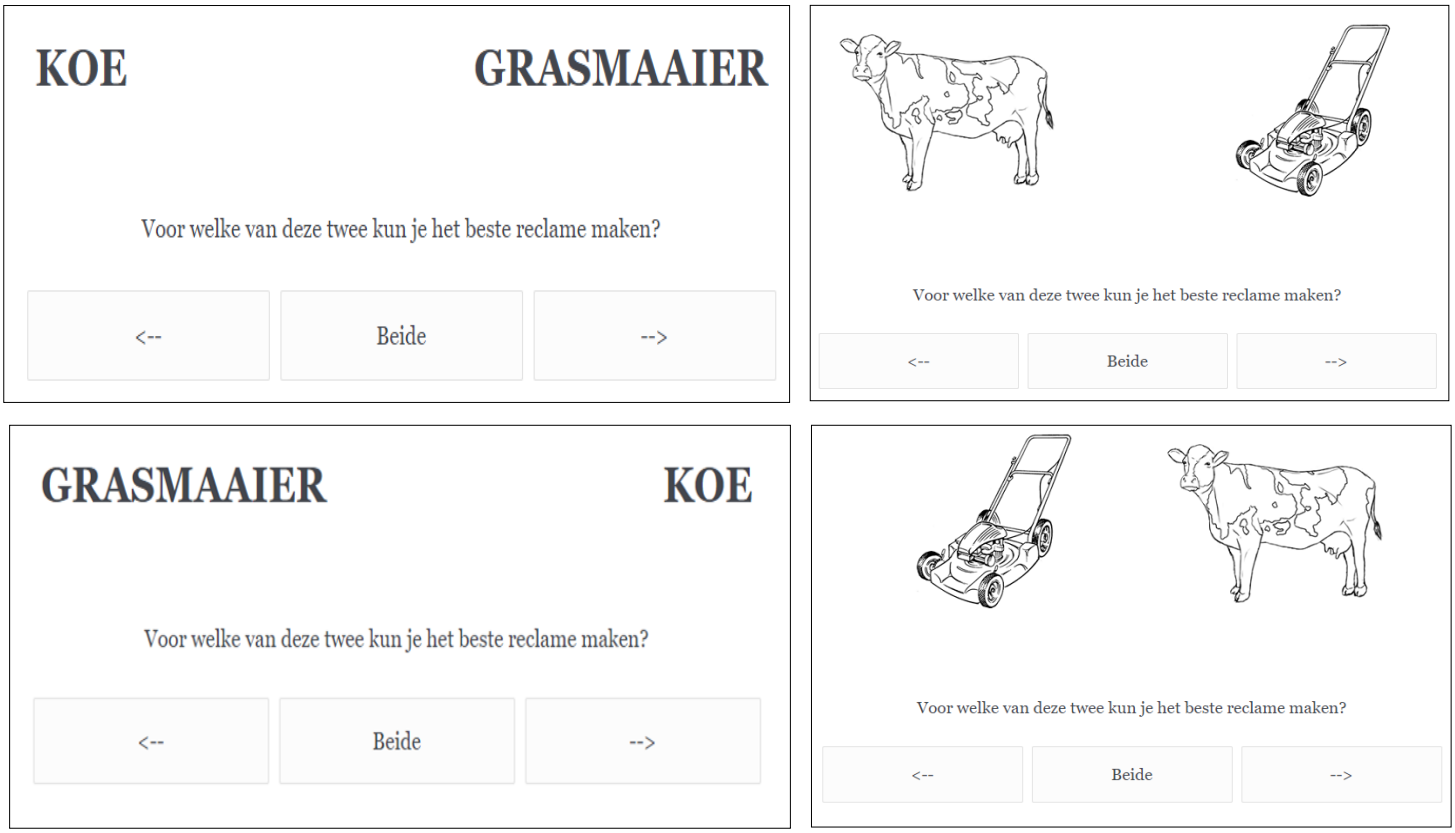


Figure 7. The four different visualisations of the object pair *lawnmower-cow* as visible in Experiment 1. Participants were assigned to either the questionnaire with words or the questionnaire with images. Within the two different questionnaires there was a random assignment to one of two order lists (*cow-lawnmower*, or *lawnmower-cow*).

On the instruction page the task of the questionnaire was clearly described. Participants were told that during the experiment they were about to see combinations of two images (or words) and that they would have to answer the question *'For which of these two could you advertise for best?'*. Participants were asked to think about their own experiences with typical advertisements, and to base their answers on this knowledge. It was explained to the participants that the objects they were about to see could be either products or services, and that each time there would be three answer options, i.e., left image, right image, or both. They

were told that there were no right or wrong answers, and that they had to answer as soon and as possible.

Participants were presented with all 55 object pairs, either depicted with words or with images. The object pairs were presented in randomized order to avoid bias. After having answered the question *'For which of these two could you advertise for best?'*, participants could go on to the next pair by clicking on >> in the right bottom corner of the screen. At the end of the questionnaire, some general questions about age, gender, nationality, and current education level were asked.

Data analysis

The aim of Experiment 1 was to determine the potential difference between symmetrical and asymmetrical object pairs. For all four different conditions, mean scores for choice percentage in participants' answers of the three possible choices of topic (i.e., left, right, and both) were calculated (0: never chosen – 1: always chosen). For instance, when a participant made a choice for both objects as suitable topic seven times out of eight expected symmetrical pairs in order (a, b), the mean score for choice for both objects for condition symmetrical (a, b) for this participant was 0,875.

To measure differences in choice of topic and response times for 55 different object pairs, 2x2x2 repeated measures ANOVA's were conducted with **expected symmetry** (symmetrical; asymmetrical) and **order** ((a, b); (b, a)) as within-subjects factors, and **modality** (visual; verbal) as between-subjects factor. Analyses were conducted by means of the statistical program JASP.

Results

Frequency tables with total scores for Experiment 1 are given in Table 16 in Appendix III. The analyses were conducted with the mean scores of choice of topic for each condition.

Chosen topic = Both objects

Descriptive statistics for the mean scores for the choice for both objects for all within-subjects variables, as a function of modality are given in Table 1.

Table 1

Experiment 1: means and standard deviations for choice for 'both objects' (0: never chosen – 1: always chosen), overall and as a function of modality.

Expected symmetry	Order	Modality	Mean score (*SD*) Part I	*N*
Symmetrical	(a, b)	visual	0.39 (0.29)	34
		verbal	0.56 (0.33)	35
	(b, a)	visual	0.35 (0.30)	34
		verbal	0.51 (0.33)	35
Asymmetrical	(a, b)	visual	0.12 (0.13)	34
		verbal	0.09 (0.12)	35
	(b, a)	visual	0.13 (0.13)	34
		verbal	0.09 (0.11)	35

It was hypothesized that expected symmetrical pairs would result in a choice for both objects more often than expected asymmetrical pairs. The results of the repeated measures ANOVA showed a significant main effect of expected symmetry on choice for both objects, F (1, 67) = 110.09, $p < .001$, $\eta^2 = 0.59$. Contrasts revealed that expected symmetrical object pairs resulted in higher scores for choice of both objects (M = 0.45, SE = 0.04) than expected asymmetrical object pairs (M = 0.11, SE = 0.01).The main effect of expected symmetry on choice for both objects is shown in Figure 8.

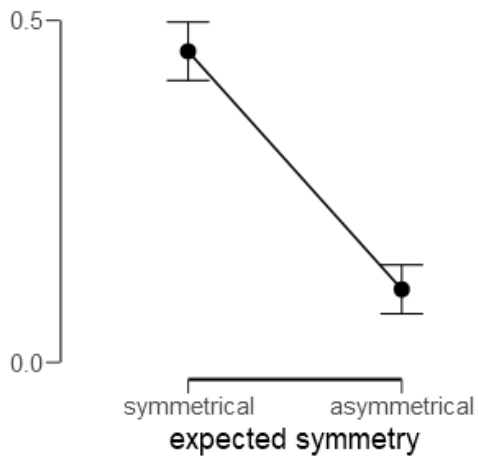


Figure 8. Experiment 1: mean scores for choice for both objects, as a function of expected symmetry.

There also was a significant interaction effect between expected symmetry and modality on choice for both objects, F (1, 67) = 9.69, p = .003, η^2 = 0.05. Contrasts revealed that the

differences between expected symmetrical pairs (*M* = 0.54, *SE* = 0.05) and expected asymmetrical pairs (*M* = 0.09, *SE* = 0.02) were larger in the verbal modality, than the differences between expected symmetrical pairs (*M* = 0.37, *SE* = 0.05) and expected asymmetrical pairs (*M* = 0.13, *SE* = 0.02) in the visual modality. The interaction effect between expected symmetry and modality on choice for both objects is shown in Figure 9.

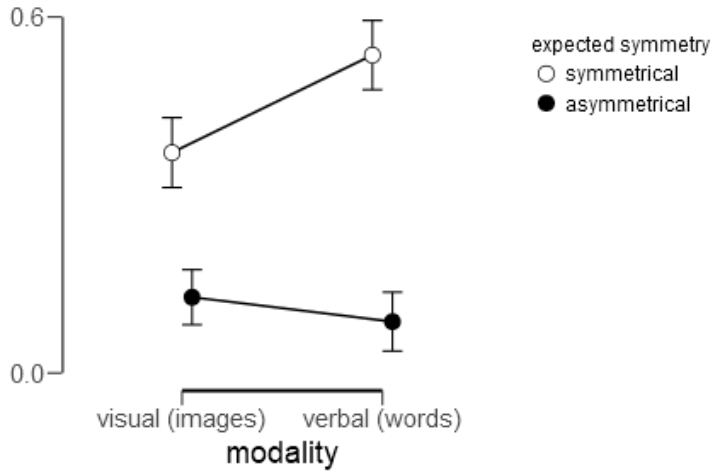


Figure 9. Experiment 1: mean scores for choice for both objects, as a function of the interaction between expected symmetry and modality.

No other significant effects were found. As for order, the repeated measures ANOVA did not reveal a significant main effect of order, indicating that the mean scores for choice for both objects were the same for object pairs in order (a, b) (*M* = 0.29, *SE* = 0.02) and object pairs in order (b, a) (*M* = 0.27, *SE* = 0.02), F (1, 67) = 1.87, p = .176, η^2 = 0.03.

As for modality, the repeated measures ANOVA did not reveal a significant main effect of modality, indicating that the mean scores for choice for both objects were the same for visually presented object pairs (*M* = 0.25, *SE* = 0.03) and verbally presented object pairs (*M* = 0.31, *SE* = 0.03), F (1, 67) = 2.13, p = .149, η^2 = 0.03.

Chosen topic = Object on the left

Descriptive statistics for the mean scores for the choice for the object on the left as topic for all within-subjects variables, as a function of modality are given in Table 2.

It was hypothesized that expected asymmetrical pairs would result in a choice for one of the objects (including the object on the left) more often than expected symmetrical pairs. The results showed a significant main effect of expected symmetry on the choice for the left object as topic, F (1, 67) = 56.31, p < .001, η^2 = 0.45. Contrasts revealed that expected

asymmetrical object pairs resulted in higher scores for choice of left object (*M* = 0.44, *SE* = 0.01) than expected symmetrical object pairs (*M* = 0.28, *SE* = 0.02).The main effect of expected symmetry on the choice for the left object is shown in Figure 10.

Table 2

Experiment 1: means and standard deviations for choice for 'object on the left' (0: never chosen – 1: always chosen), overall and as a function of modality.

Expected symmetry	Order	Modality	Mean score (*SD*) Part I	*N*
Symmetrical	(a, b)	visual	0.34 (0.20)	34
		verbal	0.29 (0.24)	35
	(b, a)	visual	0.28 (0.18)	34
		verbal	0.20 (0.17)	35
Asymmetrical	(a, b)	visual	0.75 (0.20)	34
		verbal	0.87 (0.13)	35
	(b, a)	visual	0.12 (0.12)	34
		verbal	0.02 (0.04)	35

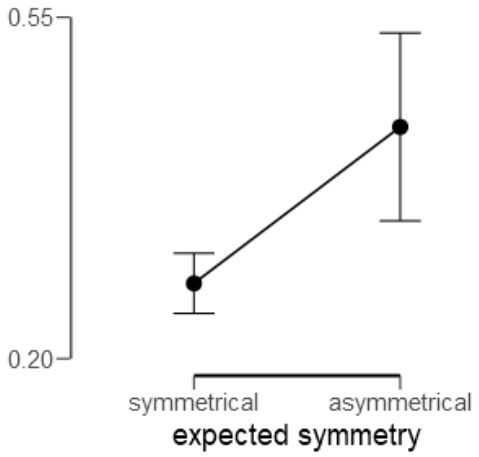


Figure 10. Experiment 1: mean scores for choice for left object, as a function of expected symmetry.

The results also showed a significant main effect of order on the choice for the left object as topic, F (1, 67) = 687.68, $p < .001$, $\eta^2 = 0.90$. Contrast revealed that object pairs in the order (a, b) resulted in higher scores for choice of left object (*M* = 0.56, *SE* = 0.02) than object pairs in the order (b, a) (*M* = 0.15, *SE* = 0.01). The main effect of order on the choice for the left object is shown in Figure 11.

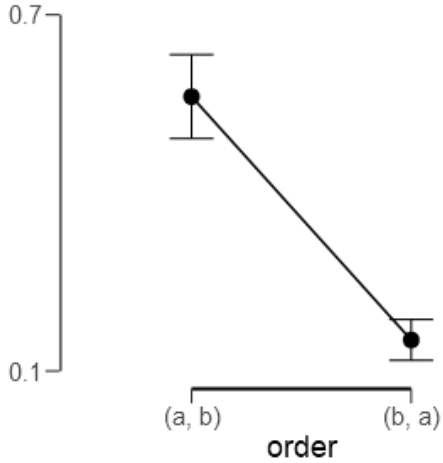


Figure 11. Experiment 1: mean scores for the choice for left object, as a function of order.

There also was a significant interaction effect between order and modality on the choice for the left object, F (1, 67) = 13.89, $p < .001$, $\eta^2 = 0.02$. The differences between order (a, b) (M = 0.58, SE = 0.02) and order (b, a) (M = 0.11, SE = 0.02) were larger in the verbal modality, than the differences between order (a, b) (M = 0.55, SE = 0.02) and order (b, a) (M = 0.20, SE = 0.02) in the visual modality. The interaction effect between order and modality on the choice for the left object is shown in Figure 12.

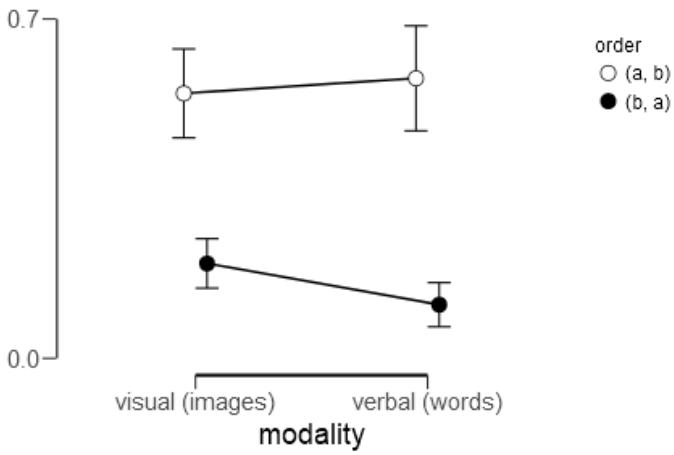


Figure 12. Experiment 1: means scores for the choice for left object, as a function of the interaction between order and modality.

There also was a significant interaction effect between expected symmetry and order on the choice for the left object, F (1, 67) = 293.61, $p < .001$, $\eta^2 = 0.80$. Contrasts revealed that the differences between order (a, b) (M = 0.81, SE = 0.02) and order (b, a) (M = 0.07, SE = 0.01) for expected asymmetrical pairs were larger than the differences between order (a, b) (M = 0.32, SE = 0.03) and order (b, a) (M = 0.24, SE = 0.02) for expected symmetrical pairs. The interaction effect between expected symmetry and order on the choice for the left object is shown in Figure 13.

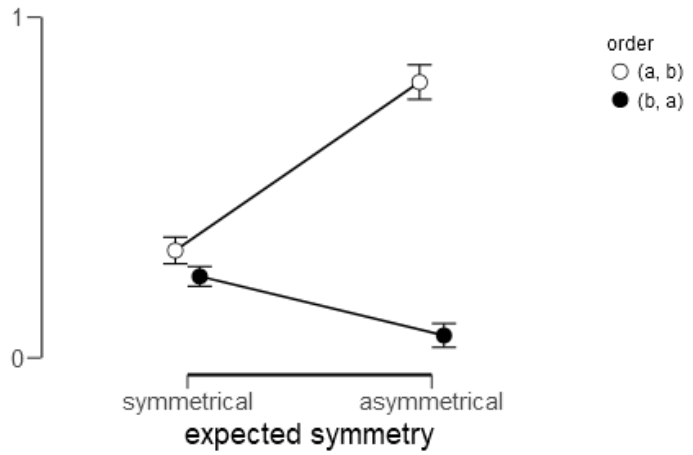


Figure 13. Experiment 1: means scores for the choice for left object, as a function of the interaction between expected symmetry and order.

There also was a significant interaction effect between expected symmetry, order, and modality, F (1, 67) = 6.19, p = .015, η^2 = 0.02. Contrasts revealed that the differences between order (a, b) (M = 0.87, SE = 0.03) and order (b, a) (M = 0.02, SE = 0.02) for expected asymmetrical pairs in the verbal modality were larger than the differences between order (a, b) (M = 0.75, SE = 0.03) and order (b, a) (M = 0.12, SE = 0.02) for expected asymmetrical pairs in the visual modality. The differences between order (a, b) (M = 0.29, SE = 0.04) and order (b, a) (M = 0.20, SE = 0.03) for expected symmetrical pairs in the verbal modality were slightly larger than the differences between order (a, b) (M = 0.34, SE = 0.04) and order (b, a) (M = 0.28, SE = 0.03) for expected symmetrical pairs in the visual modality. The interaction effect between expected symmetry, order, and modality on the choice for the left object is shown in Figure 14.

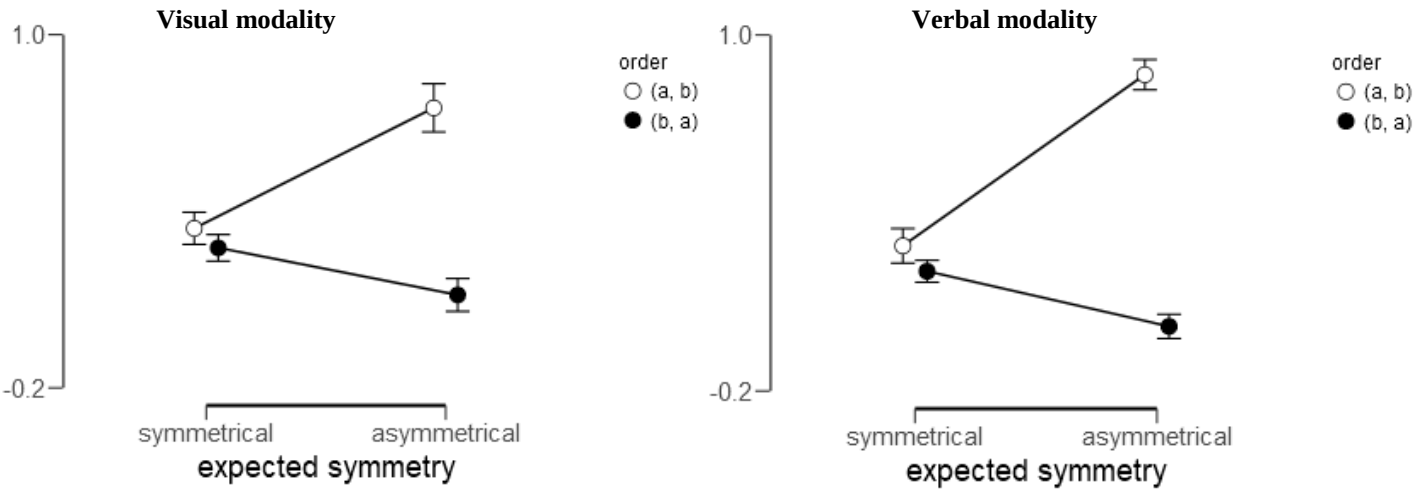


Figure 14. Experiment 1: means scores for the choice for left object, as a function of the interaction between expected symmetry, order and modality.

No other significant effects were found. As for modality, the repeated measures ANOVA did not reveal a significant main effect of modality, indicating that the mean scores for the choice for the left object were the same for visually presented object pairs (M = 0.37, SE = 0.02) and verbally presented object pairs (M = 0.34, SE = 0.02), F (1, 67) = 1.23, p = .272, η^2 = 0.02.

Chosen topic = Object on the right

Descriptive statistics for the mean scores for the choice for the object on the right as topic for all within-subjects variables, as a function of modality are given in Table 3.

Table 3

Experiment 1: means and standard deviations for choice for 'object on the right' (0: never chosen – 1: always chosen), overall and as a function of modality.

Expected symmetry	Order	Modality	Mean score (*SD*) Part I	*N*
Symmetrical	(a, b)	visual	0.27 (0.12)	34
		verbal	0.15 (0.16)	35
	(b, a)	visual	0.37 (0.21)	34
		verbal	0.28 (0.22)	35
Asymmetrical	(a, b)	visual	0.13 (0.16)	34
		verbal	0.05 (0.07)	35
	(b, a)	visual	0.75 (0.19)	34
		verbal	0.90 (0.11)	35

It was hypothesized that expected asymmetrical pairs would result in a choice for one of the objects (including the object on the right) more often than expected symmetrical pairs. The results showed a significant main effect of expected symmetry on the choice for the right object as topic, F (1, 67) = 107.09, p < .001, η^2 = 0.57. Contrasts revealed that expected asymmetrical object pairs resulted in higher scores for choice of right object (M = 0.46, SE = 0.01) than expected symmetrical object pairs (M = 0.27, SE = 0.02). The main effect of expected symmetry on the choice for the right object is shown in Figure 15.

The results also showed a significant main effect of order on the choice for the right object as topic, F (1, 67) = 739.76, p < .001, η^2 = 0.90. Contrasts revealed that object pairs in the order (b, a) resulted in higher scores for choice of right object (M = 0.58, SE = 0.02) as

object pairs in the order (a, b) (*M* = 0.15, *SE* = 0.01). The main effect of order on the choice for the right object is shown in Figure 16.

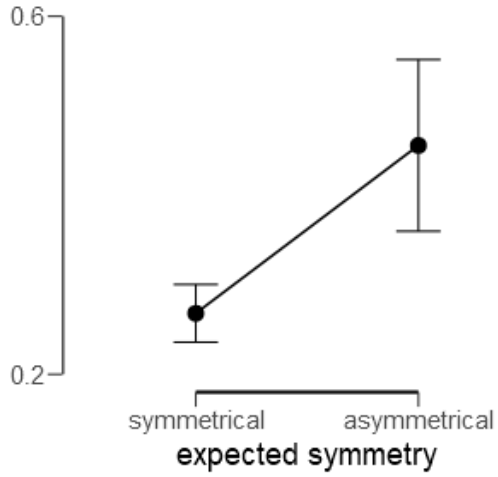


Figure 15. Experiment 1: mean scores for choice for right object, as a function of expected symmetry.

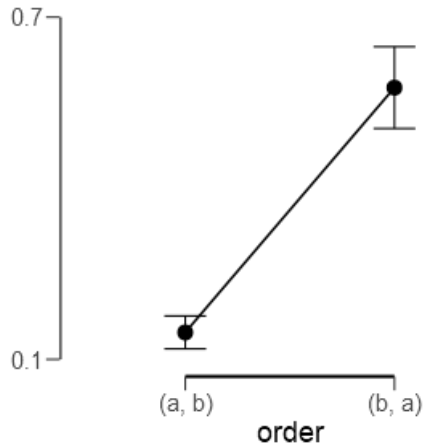


Figure 16. Experiment 1: mean scores for choice for right object, as a function of order.

There also was a significant interaction effect between expected symmetry and modality on the choice for the right object, F (1, 67) = 13.96, $p < .001$, $\eta^2 = 0.07$. Contrasts revealed that the differences between expected symmetrical pairs (*M* = 0.22, *SE* = 0.03) and expected asymmetrical pairs (*M* = 0.47, *SE* = 0.01) were larger in the verbal modality, than the differences between expected symmetrical pairs (*M* = 0.32, *SE* = 0.03) and expected asymmetrical pairs (*M* = 0.44, *SE* = 0.01) in the visual modality. The interaction effect between expected symmetry and modality on the choice for the right object is shown in Figure 17.

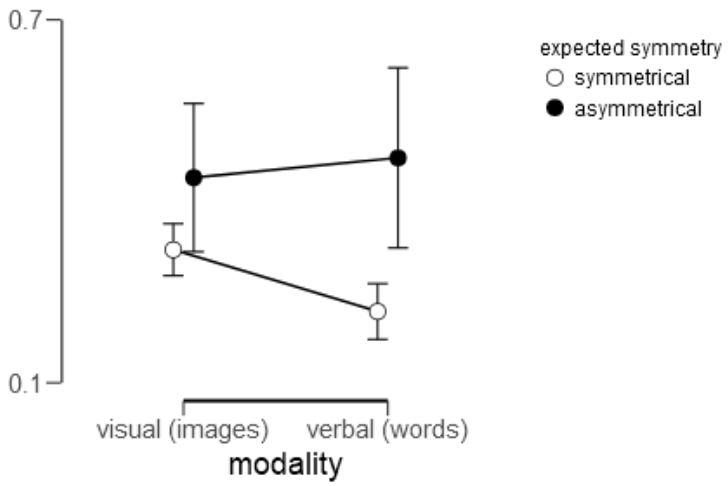


Figure 17. Experiment 1: means scores for the choice for right object, as a function of the interaction between expected symmetry and modality.

There also was a significant interaction effect between order and modality on the choice for the right object, F (1, 67) = 15.67, $p < .001$, $\eta^2 = 0.02$. Contrasts revealed that the differences between order (a, b) (M = 0.10, SE = 0.02) and order (b, a) (M = 0.59, SE = 0.02) were larger in the verbal modality, than the differences between order (a, b) (M = 0.20, SE = 0.02) and order (b, a) (M = 0.56, SE = 0.02) in the visual modality. The interaction effect between order and modality on the choice for the right object is shown in Figure 18.

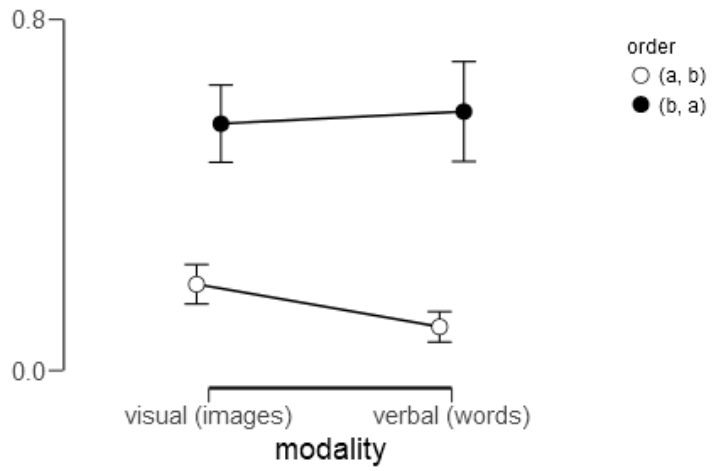


Figure 18. Experiment 1: means scores for the choice for right object, as a function of the interaction between order and modality.

There also was a significant interaction effect between expected symmetry and order on the choice for the right object, F (1, 67) = 246.03, $p < .001$, $\eta^2 = 0.77$. Contrasts revealed that the differences between order (a, b) (M = 0.09, SE = 0.01) and order (b, a) (M = 0.83, SE = 0.02) for expected asymmetrical pairs were larger than the differences between order (a, b) (M =

0.21, *SE* = 0.02) and order (b, a) (*M* = 0.33, *SE* = 0.03) for expected symmetrical pairs. The interaction effect between expected symmetry and order on the choice for the right object is shown in Figure 19.

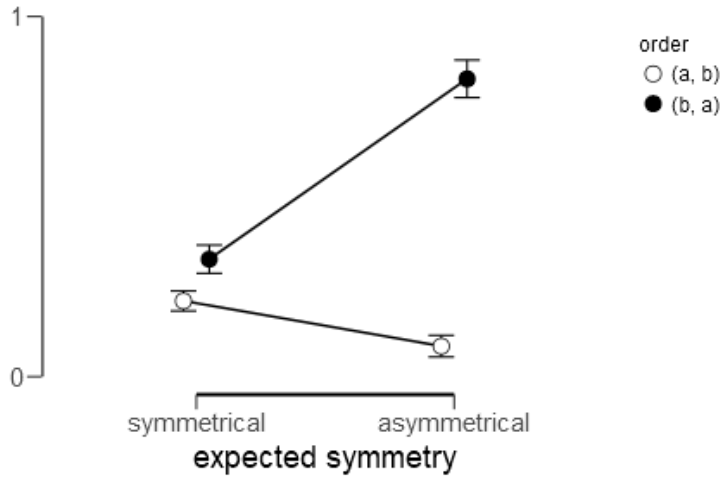


Figure 19. Experiment 1: means scores for the choice for right object, as a function of the interaction between expected symmetry and order.

There also was a significant interaction effect between expected symmetry, order, and modality, F (1, 67) = 6.18, p = .015, η^2 = 0.02. Contrasts revealed that the differences between order (a, b) (*M* = 0.05, *SE* = 0.02) and order (b, a) (*M* = 0.90, *SE* = 0.03) for expected asymmetrical pairs in the verbal modality were larger than the differences between order (a, b) (*M* = 0.13, *SE* = 0.02) and order (b, a) (*M* = 0.75, *SE* = 0.03) for expected asymmetrical pairs in the visual modality. The differences between order (a, b) (*M* = 0.15, *SE* = 0.02) and order (b, a) (*M* = 0.28, *SE* = 0.04) for expected symmetrical pairs in the verbal modality were slightly larger than the differences between order (a, b) (*M* = 0.27, *SE* = 0.02) and order (b, a) (*M* = 0.37, *SE* = 0.04) for expected symmetrical pairs in the visual modality. The interaction effect between expected symmetry, order, and modality on the choice for the right object is shown in Figure 20.

No other significant effects were found. As for modality, the repeated measures ANOVA did not reveal a significant main effect of modality, indicating that the mean scores for the choice for the right object were the same for visually presented object pairs (*M* = 0.38, *SE* = 0.02) and verbally presented object pairs (*M* = 0.35, *SE* = 0.02), F (1, 67) = 2.25, p = .138, η^2 = 0.03.

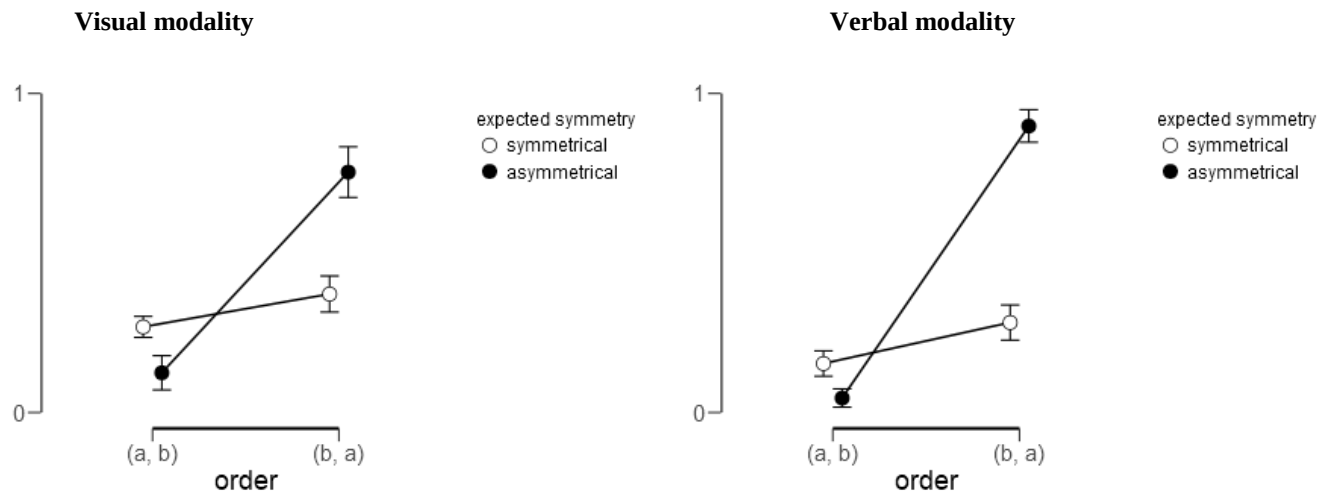


Figure 20. Experiment 1: means scores for the choice for right object, as a function of the interaction between expected symmetry, order and modality.

Response Times

A third analysis was conducted for the response times. Descriptive statistics for the mean response times for all within-subjects variables, as a function of modality are given in Table 4.

Table 4

Experiment 1; means and standard deviations of response times (in msec), overall and as a function of modality.

Expected symmetry	Order	Modality	Mean RT (*SD*)	*N*
Symmetrical	(a, b)	visual	7187 (7721)	34
		verbal	5502 (4560)	35
	(b, a)	visual	4995 (1377)	34
		verbal	4608 (1709)	35
Asymmetrical	(a, b)	visual	5284 (1951)	34
		verbal	4360 (1571)	35
	(b, a)	visual	4925 (1458)	34
		verbal	4109 (1254)	35

It was hypothesized that expected symmetrical pairs would result in longer response times than expected asymmetrical pairs. The results of the repeated measures ANOVA showed a significant main effect of expected symmetry on response times, F (1, 67) = 6.16, p = .016, η^2 = 0.08. Contrasts revealed that asymmetrical object pairs resulted in faster response times (*M*

= 4669.64, *SE* = 175.25) than symmetrical objects pairs (*M* = 5573.22, *SE* = 415.46). The main effect of expected symmetry on response times is shown in Figure 21.

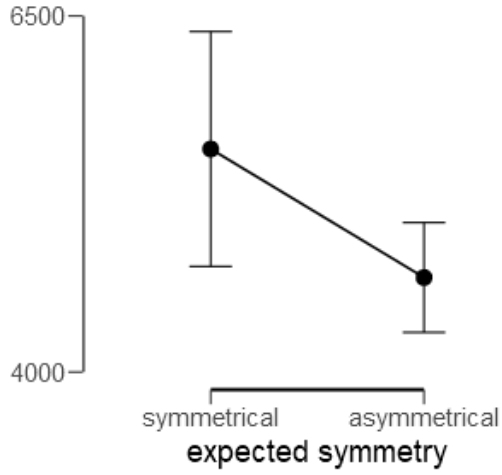


Figure 21. Experiment 1: mean response times, as a function of expected symmetry.

There was a significant main effect of order on response times, F (1, 67) = 6.13, p = .016, η^2 = 0.08. Contrasts revealed that the order (b, a) resulted in faster response times, (*M* = 4659.46, *SE* = 163.59), than the order (a, b) (*M* = 5583.40, *SE* = 424.25). The main effect of order on response times is shown in Figure 22.

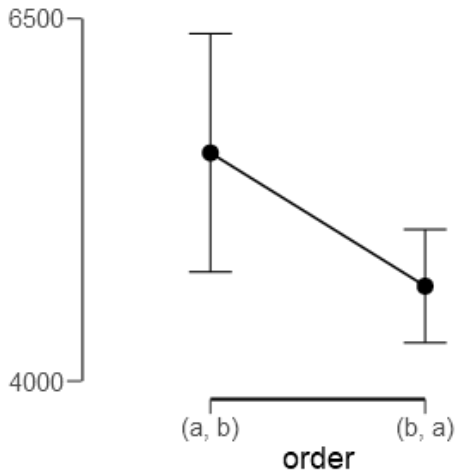


Figure 22. Experiment 1: mean response times, as a function of order.

No other significant effects were found. As for modality, the repeated measures ANOVA did not reveal a significant main effect of modality, indicating that the mean response times were similar for participants who were presented with the object pairs in the visual modality (*M* = 5597.92, *SE* = 372.94) and participants who were presented with the object pairs in the verbal modality (*M* = 4644.94, *SE* = 367.57), F (1, 67) = 3.31, p = .073, η^2 = 0.05.

Discussion

In Experiment 1 participants decided for 55 object pairs which of the two objects could best be advertised for (object *a*, object *b* or both). To compare verbal and visual object pairs, half of the participants saw the object pairs in images, the other half saw the object pairs in words. Of 39 pairs it was expected that they could be determined as asymmetrical, i.e., resulting in a choice for one of the objects as suitable topic. One of the objects of these expected asymmetrical pairs was a consumer good, and therefore the most likely topic for an advertisement. Of 16 object pairs it was expected that they could be determined as symmetrical, i.e., resulting in a choice for both objects as suitable topic. Of these expected symmetrical pairs, both objects were consumer goods and therefore both possible topics for an advertisement. Furthermore, it was hypothesized that the expected symmetrical object pairs would result in longer response times than the expected asymmetrical object pairs, because it would probably take longer for participants to make a decision between two consumer goods. Based on Chiappe et al. (2003) and Kress and Van Leeuwen (2006), it was hypothesized that order of objects would affect the choice of topic, especially in expected symmetrical object pairs.

In Table 16 in Appendix III, the total frequency scores for choice of topic are given. Confirming the first two hypotheses, expected symmetrical object pairs resulted in a choice for both objects as suitable topic more often than expected asymmetrical object pairs. Expected asymmetrical object pairs resulted in a choice for one of the objects (left or right) as suitable topic more often than expected symmetrical object pairs.

An effect of expected symmetry on response times was found as well, confirming the fourth hypothesis. Participants needed more time to decide which of the two objects would be best to advertise for when they were presented with expected symmetrical pairs, as compared to expected asymmetrical pairs.

Object pairs with the order (a, b) resulted in a choice for the object on the left as suitable topic more often than the order (b, a), and object pairs with the order (b, a) resulted in a choice for the object on the right as suitable topic more often than the order (a, b). As for expected asymmetrical pairs, these differences in order make sense. One of the objects in the expected asymmetrical pairs was a consumer good (e.g., *bike* in *bike-antelope*), and therefore most likely to be chosen as most suitable topic. Independent of the placement of this consumer good (*bike-antelope* or *antelope-bike*), participants chose this object as most suitable topic for an advertisement, resulting a choice for the left object in order (a, b) and for

the right object in order (b, a). As for expected symmetrical object pairs, the results did not confirm our third hypothesis. Although some preference for the object on the left over the object on the right is visible for expected symmetrical pairs in the order (a, b), we cannot conclude that the left object was chosen more often than the right object as most suitable topic. We expected that participants would interpret the left or first object more often as fixed topic than the right or second object, based on Chiappe et al. (2003) and Kress and Van Leeuwen (2006). An explanation for not finding this effect of order on choice of topic in expected symmetrical object pairs could be the instrumentation of the first experiment. The question '*For which of these two could you advertise for best?'* might not have invited people to cross-domain mapping at all, but rather to solely comparing the two objects. Presumably, an effect of order on choice of topic in symmetrical pairs would only occur in cases of cross-domain mapping, i.e., when metaphorical interpretations are elicited. In Experiments 2 and 3, where participants might be more likely to make metaphorical interpretations, order might have an effect on the interpretation of symmetrical object pairs.

As for modality, differences in choice of object between expected symmetrical and expected asymmetrical pairs, and between order (a, b) and order (b, a), were larger in the verbal modality than in the visual modality. An explanation could be that object pairs in the visual modality already look somewhat similar to real advertisements that often contain images as well. It might be harder to choose which of the objects is best to advertise for when both objects are presented visually as if they are already part of an advertisement, resulting in smaller differences. In the verbal modality, no explicit perceptual features are given. Participants in the verbal modality had to make a decision based on their own representations of the objects, which might have resulted in larger differences between expected asymmetrical and expected symmetrical object pairs regarding the choice of topic.

To conclude, Experiment 1 confirmed that a difference can be made between symmetrical object pairs, in which both objects could be interpreted as topic, and asymmetrical object pairs, in which one of the objects is most likely to be interpreted as topic. For each type of symmetry the eight best object pairs were selected to be used in Experiment 2 and Experiment 3. Object pairs of which most participants agreed about which object was the most suitable topic, i.e., both objects for symmetrical pairs, and object *a* (consumer good) for asymmetrical pairs, were selected. The selected pairs are included in Appendix II. Our next experiments will further investigate the cues of (a)symmetry, order, context and modality on the interpretation of juxtaposed entities.

Experiment 2

Introduction

Based on the results of the first experiment, a distinction could be made between symmetrical and asymmetrical object pairs. In the second experiment participants will be presented with symmetrical and asymmetrical pairs of objects, and will be asked: *'What is the connection between these two objects?'*.

Previous studies have investigated the role of order in the interpretation of verbal metaphors (Chiappe et al., 2003) and visual metaphors (Indurkhya and Ojha, 2017). To elicit metaphorical interpretations, one of the juxtaposed objects must be interpreted as topic. In the first experiment, order did not have the expected effect on the interpretation of symmetrical objects pairs, probably due to the question that was asked to the participants resulting in a process of comparison instead of cross-domain mapping. In Experiment 2, participants might be more likely to use cross-domain mapping to find a connection between the objects. The order of the juxtaposed object might affect which of the objects is interpreted as topic, especially for symmetrical object pairs in which both objects would be suitable topics. There are two possible orders of objects for each type of object pair, i.e., (a, b) and (b, a);

- **Symmetrical pair →** Consumer good (*a*) – consumer good (*b*);
- **Symmetrical pair →** Consumer good (*b*) – consumer good (*a*);
- **Asymmetrical pair →** Consumer good (*a*) – natural object/ uncommon tool (*b*);
- **Asymmetrical pair →** Natural object/ uncommon tool (*b*) – consumer good (*a*).

As for symmetrical pairs, it is expected that participants will describe or choose a connection indicating an interpretation of comparison between object *a* and object *b*. As for asymmetrical pairs, it is expected that participants' answers would indicate a metaphorical interpretation. As for order, it is expected that order affects the type of interpretation, especially for symmetrical pairs. Furthermore, it is expected that finding connections for symmetrical pairs will result in longer response times than finding connections for asymmetrical pairs. The hypotheses for Experiment 2 are as follows;

- Symmetrical pairs will result in interpretations of comparison between object *a* and object *b*;
- Asymmetrical pairs will result in metaphorical interpretations;
- Order of the objects will affect type of interpretation, especially for symmetrical pairs;
- Response times will be longer for symmetrical pairs than for asymmetrical pairs.

Methods

Materials

The materials for the second experiment consisted of 16 object pairs, 8 symmetrical object pairs, e.g., *banana-bread*, and 8 asymmetrical object pairs, e.g., *bike-antelope*. An overview of all the stimuli that were used in Experiment 2 can be found in Appendix II.

A major part of the objects that were used in the second experiment were all consumer goods (i.e., *bicycle, guitar, bathrobe, dress, mattress, speedboat, vacuum cleaner, hot sauce, banana, bed, beer, bread, tissue, air freshener, perfume,* and *tea*). These objects frequently appear in advertisements. In order to generalize the experiment's findings, objects from different price ranges were used; the objects ranged from affordable products like bread and bananas to more expensive products like mattresses and speedboats.

The objects that were juxtaposed with the consumer goods in asymmetrical pairs (i.e., *antelope, atomic bomb, feather, butterfly, cloud, swordfish, tornado,* and *hand grenade*), were animals, nature-related things and war-related human tools. These things cannot be bought by general consumers and are therefore no typical topics of advertisements. In contrast, the objects that were juxtaposed with the consumer goods in symmetrical pairs (i.e., *bread, sleeping bag, ice cream, orange, pillow, fan, detergent,* and *scarf*), were also things created by humans to be used in the house, and products that are oftentimes consumed and which can be bought in malls and supermarkets.

Because both objects in the symmetrical pairs were consumer goods that are being advertised for a lot, perceivers will need more time (and information) to decide which of the two objects might be the target of the ad. Without an informative context like a relevant background, a brand name or an explicitly given product category, both objects could be interpreted as target of the ad.

The objects used in Experiment 2 had similar concreteness ratings so that different levels of concreteness could not influence the results. The mean concreteness ratings were derived from a large study conducted by Brysbaert, Stevens, De Deyne, Voorspoels and Storms (2014). In this study rating norms for age of acquisition and concreteness were collected for 30.000 Dutch words. The concreteness ratings were measured on a five points scale (1: very abstract/ language based; 5: very concrete/experience based). For all objects that were used in Experiment 2, the mean concreteness ratings varied between 4.2 and 5.

Besides the 16 experimental stimuli, Experiment 2 contained 8 pairs of dissimilar objects functioning as fillers. The 8 filler pairs were *binocular-road roller, cow-dart arrow,*

saw-tent, steam iron-castle, octopus-car, tire-apple juice, candy-lawnmower, and *croissant-helmet*.

Participants

Participation in the experiment was voluntarily. Most participants signed up for the questionnaire via the Tilburg University participant pool SONA. These participants were given 0.5 credit hours for their participation. Other participants were recruited via social media or were asked personally at the Radboud University in Nijmegen, and did not receive any form of compensation. All participants were given the opportunity to write down their email address at the end of the questionnaire for the chance to win a 10 euro gift card. 74 participants completed the questionnaire in Qualtrics. On average it took 15 minutes to complete the questionnaire. The mean age of the participants was 22 years old (min. 18 - max. 53), and the male-female ratio was 26%-74%.

Design

Similar to the design of Experiment 1, the design of Experiment 2 was a 2x2x2 mixed design, with **modality** as between factor (visual; verbal), and **symmetry** (symmetrical; asymmetrical) and **order of objects** ((a, b) or (b, a)) as within factors.

Instrumentation

The questionnaire consisted of two parts. In part 1, each of the 16 object pairs and each of the 8 fillers were shown on a separate page. After participants had decided what the connection between the two objects was, or after they had decided that there was no connection, they could go on by clicking on >> in the right bottom corner of the screen (Bowdle & Gentner, 2005). The time spent on each page was measured in milliseconds. On a second page participants were presented with the question *'What is the connection between these two objects?'* and a text box in which they could type down their answer. (The original question was in Dutch: *'Wat is de connectie tussen deze twee objecten?*'). Showing participants different visual displays of two entities and asking them to write down their thoughts about the connections between these entities, could reveal which entities' features are salient for the participants, and which display schemas and domain knowledge they use (Hegarty, 2011).

In part 2, all object pairs and fillers were shown again in a randomized order, though with the same order of the objects within each pair. Again participants saw the question *'What*

is the connection between these two objects?'. This time the object pair and the question were shown on the same page. Participants had to choose one out of four answer options that suggested a connection between the two objects. In the case of the object pair *antelope-bike*, presented in either images or words, the answer options were;

- An antelope is a bike
- A bike is an antelope
- I see an antelope and a bike / I see the words antelope and bike
- The objects are comparable

Again, response times for how long people spent on each question page were measured in milliseconds.

Procedure

All participants started at the welcome page. After this page they were randomly assigned to either the questionnaire with the stimuli presented in words, or the questionnaire with the stimuli presented in images. Similar to Experiment 1, within the two different modalities of Experiment 2 participants were randomly assigned to one of two lists that differed in the order of the objects, e.g. *antelope-bike* versus *bike-antelope*. The object pairs were presented in randomized order to avoid bias.

At the instruction page they were told that the questionnaire would consist of two parts. In the first part they would see 24 pairs of objects that were connected to one another, accompanied by the question *'What is the connection between these two objects?'*. In the instruction text participants were told that it could be possible that they would not find any connection between the objects. They were instructed to answer in whole sentences and to explicitly name both objects in their answer. A few examples of possible connections between an airplane and a swan and between a tomato and a rose were given.

After finishing part 1, participants were presented with another instruction page for part 2. They were told that they would see the same object pairs again, accompanied by the same question, but this time with four given answers out of which they had to choose one. Examples of *airplane-swan* and *tomato-rose* were given, though this time adapted to the four different answer options (*X is Y, Y is X, I see X* and *Y, X and Y are comparable*). Response times were measured in milliseconds. At the end of the questionnaire, some general questions about age, gender, nationality, and current education level were asked.

Data analysis

All participants' answers for both parts of the questionnaire were coded. When participants indicated that they could not find a connection, the answer was coded as 'no connection found'. Sometimes an odd connection was found, e.g., "*Both banana and bread start with the letter B"*; these answers were coded as 'no connection found' as well. When participants clearly made a metaphorical interpretation, by using the words *'as (if)'* or by naming one of the object with a certain feature and subsequently applying this feature to the other object, the answer was coded as 'metaphorical'. When participants compared both objects on the same level, for instance by using the words *'both'*, the answer was coded as 'comparison'. All codings were checked by an independent coder. In cases of doubt, the first coder decided which coding category was chosen. The coding categories and some examples from the real data (part I) are given in Appendix IV.

The aim of Experiment 2 was to further gauge the effects of (a)symmetry and order on the interpretation of juxtaposed entities, without an advertising context. For each condition, mean scores of presence percentage for all interpretation types were measured to calculate to what degree the interpretation categories (interpretation of comparison, no connection, or metaphorical interpretation) were manifested in participants' answers (0: interpretation type was present in none of participants' answers – 1: interpretation type was present in all participants' answers). For instance, when a participant made a metaphorical connection two times out of four asymmetrical pairs in order (a, b), the mean score for metaphorical interpretation for condition asymmetrical (a, b) for this participant was 0,5.

To measure interpretation type and response times of 16 different object pairs, 2x2x2 repeated measures ANOVA's were conducted with **symmetry** (symmetrical; asymmetrical) and **order** ((a, b); (b, a)) as within-subject factors and **modality** (visual; verbal) as between-subjects factor. Analyses were done by means of the statistical program JASP.

Results

Frequency tables with total scores for Experiment 2.1 and 2.2 are given in Table 17, 18, 19 and 20 in Appendix III. The analyses were conducted with the mean scores of all three interpretation types for each condition.

Interpretation = Comparison

Participants' answers were coded as comparison, metaphorical interpretation, or no connection found, for both the first part (open answer question) and the second part (multiple choice question). Descriptive statistics for the mean scores for an interpretation of comparison for all within-subjects variables, as a function of modality are given in Table 5.

Table 5

Experiment 2: means and standard deviations for comparison scores in part I and part II, overall and as a function of modality (0: interpretation type was present in none of participants' answers – 1: interpretation type was present in all participants' answers).

Symmetry	Order	Modality	Mean score (*SD*) Part I	Mean score (*SD*) Part II	*N*
Symmetrical	(a, b)	visual	0.96 (0.15)	0.59 (0.34)	36
		verbal	0.98 (0.07)	0.60 (0.33)	38
	(b, a)	visual	0.93 (0.19)	0.57 (0.30)	36
		verbal	0.98 (0.09)	0.68 (0.34)	38
Asymmetrical	(a, b)	visual	0.72 (0.26)	0.38 (0.30)	36
		verbal	0.82 (0.23)	0.38 (0.28)	38
	(b, a)	visual	0.79 (0.24)	0.31 (0.30)	36
		verbal	0.74 (0.28)	0.37 (0.31)	38

It was hypothesized that symmetrical pairs would result in interpretations of comparison between object *a* and object *b* more often than asymmetrical pairs. In the first part of the questionnaire, participants wrote down their own interpretations of the connections between the objects. The results of the repeated measures ANOVA showed a significant main effect of symmetry on interpretation of comparison, F (1, 72) = 87.29, $p < .001$, $\eta^2 = 0.55$. Contrasts revealed that symmetrical object pairs resulted in higher scores for comparison interpretations (M = 0.96, SE = 0.01) than asymmetrical object pairs (M = 0.77, SE = 0.02). In the second part of the questionnaire, where participants had to choose one of the four given interpretations, a significant main effect of symmetry on interpretation of comparison was also found, F (1, 72) = 56.22, $p < .001$, $\eta^2 = 0.44$. Contrasts revealed that again symmetrical object pairs resulted in higher scores for comparison interpretations (M = 0.61, SE = 0.03) than asymmetrical object pairs (M = 0.36, SE = 0.03).The main effects of symmetry on comparison scores in part 1 and part 2 of the questionnaire are shown in Figure 23.

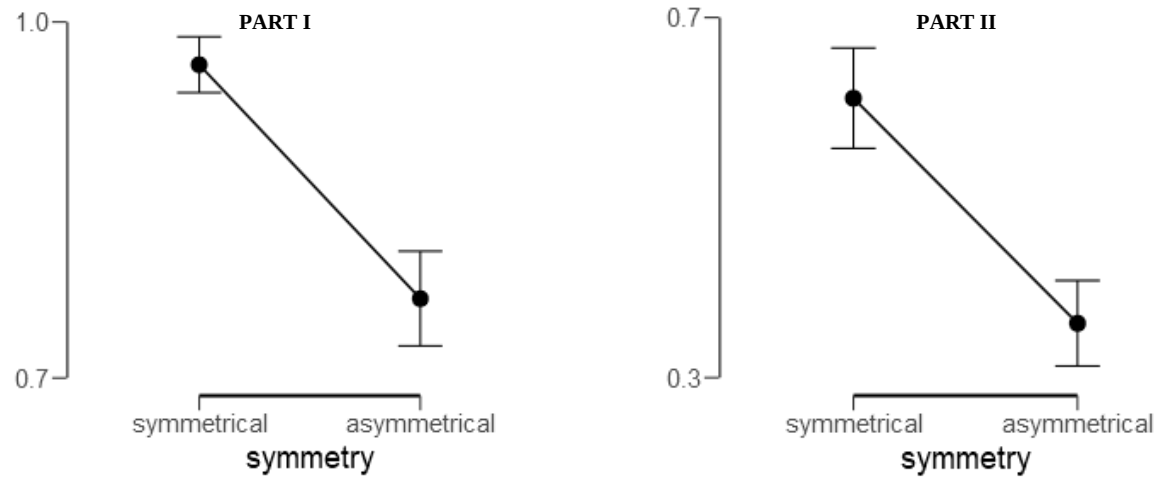


Figure 23. Experiment 2: mean scores interpretation of comparison in part I (left) and part II (right), as a function of symmetry.

In the first part of the questionnaire, a significant interaction was found between symmetry, order and modality, F (1, 72) = 6.82, p = .011, η^2 = 0.09. For symmetrical pairs in the visual modality, contrasts revealed that the scores for comparison interpretations were slightly higher for order (a, b) (M = 0.96, SE = 0.02) than for order (b, a) (M = 0.93, SE = 0.02). For symmetrical pairs in the verbal modality, there were no differences between order (a, b) (M = 0.98, SE = 0.02) and order (b, a) (M = 0.98, SE = 0.02) in the scores for comparison interpretations. For asymmetrical pairs in the visual modality, the scores for comparison interpretations were slightly higher for order (b, a) (M = 0.79, SE = 0.04) than for order (a, b) (M = 0.72, SE = 0.04). For asymmetrical pairs in the verbal modality on the other hand, the scores for comparison interpretations were slightly higher for order (a, b) (M = 0.82, SE = 0.04) than for order (b, a) (M = 0.74, SE = 0.04). The interaction effect between symmetry, order and modality is shown in Figure 24.

No other significant effects were found. As for order, the repeated measures ANOVA did not reveal a significant main effect of order. In part 1, object pairs with the order (a, b) resulted in the same scores of comparison (M = 0.87, SE = 0.02) as object pairs with the order (b, a) (M = 0.86, SE = 0.02), F (1, 72) = 0.25, p = .621, η^2 = 0.003. In part 2, object pairs with the order (a, b) resulted in the same comparison scores (M = 0.49, SE = 0.03) as object pairs with the order (b, a) (M = 0.48, SE = 0.03), F (1, 72) = 0.02, p = .902, η^2 = 0.00.

As for modality, no main effects were found. In part 1, visually presented object pairs resulted in the same comparison scores (M = 0.85, SE = 0.02) as verbally presented object pairs (M = 0.88, SE = 0.02), F (1, 72) = 0.77, p = .383, η^2 = 0.01. In part 2, visually presented

object pairs resulted in the similar comparison scores (M = 0.46, SE = 0.04) as verbally presented object pairs (M = 0.51, SE = 0.04), F (1, 72) = 0.83, p = .367, η^2 = 0.01.

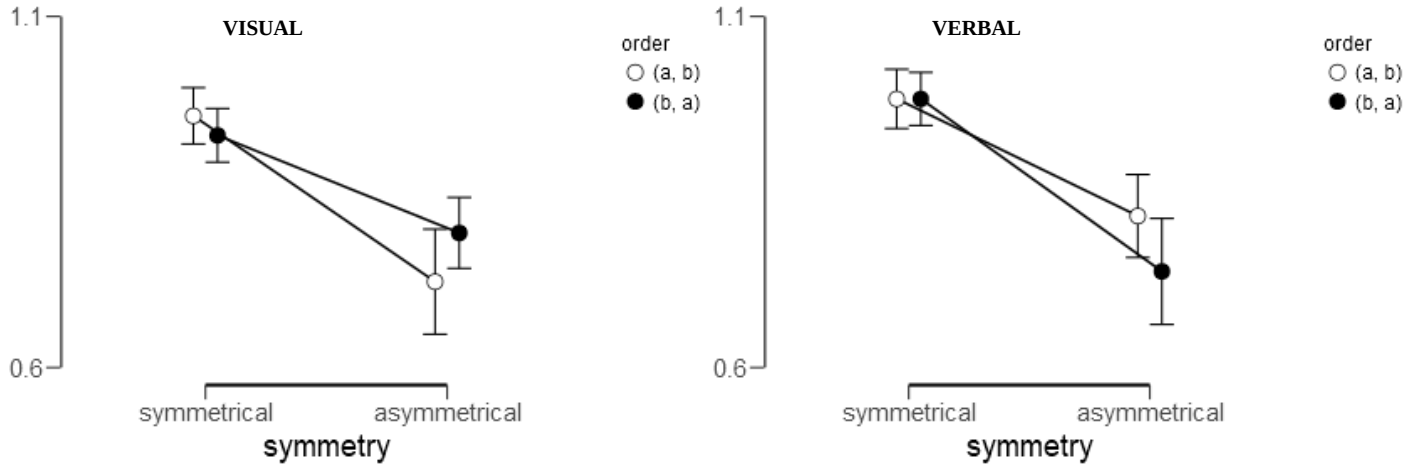


Figure 24. Experiment 2: mean scores interpretation of comparison in part I of the questionnaire, as a function of the interaction between symmetry, order and modality.

Interpretation = Metaphorical

Participants' answers were coded as comparison, metaphorical interpretation, or no connection found, for both the first part (open answer question) and the second part (multiple choice question). Descriptive statistics for the mean scores for a metaphorical interpretation for all within-subjects variables, as a function of modality are given in Table 6.

It was hypothesized that asymmetrical pairs would result in metaphorical interpretations more often than symmetrical pairs. In the first part of the questionnaire, participants wrote down their own interpretations of the connections between the objects. The results of the repeated measures ANOVA showed a significant main effect of symmetry on metaphorical interpretation, F (1, 72) = 9.63, p = .003, η^2 = 0.12. Contrasts revealed that asymmetrical object pairs resulted in higher scores for metaphorical interpretation (M = 0.08, SE = 0.02) than symmetrical object pairs (M = 0.02, SE = 0.01). In the second part of the questionnaire, where participants had to choose one of the four given interpretations, no significant main effect of symmetry on metaphorical interpretation was found, F (1, 72) = 0.36, p = .551, η^2 = 0.01. Symmetrical object pairs resulted in the same scores for metaphorical interpretation (M = 0.27, SE = 0.03) as asymmetrical object pairs (M = 0.28, SE = 0.03). The main effect of symmetry on metaphorical interpretation in part 1 of the questionnaire is shown in Figure 25.

Table 6

Experiment 2: means and standard deviations for metaphorical interpretation score in part I and part II, overall and as a function of modality (0: interpretation type was present in none of participants' answers – 1: interpretation type was present in all participants' answers).

Symmetry	Order	Modality	Mean score (*SD*) Part I	Mean score (*SD*) Part II	*N*
Symmetrical	(a, b)	visual	0.03 (0.14)	0.26 (0.29)	36
		verbal	0.01 (0.05)	0.29 (0.28)	38
	(b, a)	visual	0.04 (0.18)	0.26 (0.29)	36
		verbal	0.01 (0.08)	0.26 (0.32)	38
Asymmetrical	(a, b)	visual	0.10 (0.23)	0.29 (0.32)	36
		verbal	0.07 (0.16)	0.32 (0.29)	38
	(b, a)	visual	0.06 (0.19)	0.26 (0.34)	36
		verbal	0.09 (0.20)	0.25 (0.31)	38

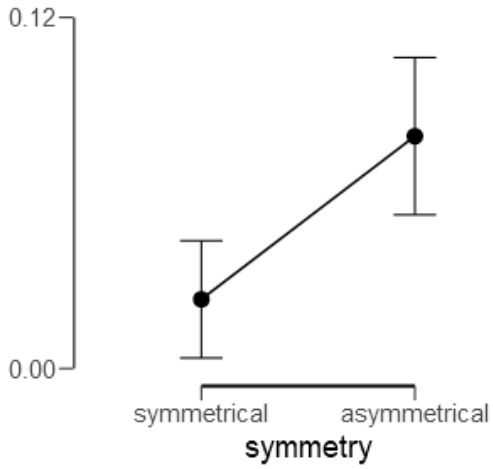


Figure 25. Experiment 2: mean scores of metaphorical interpretation in part I, as a function of symmetry.

No other significant effects were found. As for order, the repeated measures ANOVA did not reveal a significant main effect of order. In part 1, object pairs with the order (a, b) resulted in the same scores of metaphorical interpretation (M = 0.05, SE = 0.02) as object pairs with the order (b, a) (M = 0.05, SE = 0.02), F (1, 72) = 0.03, p = .868, η^2 = 0.00. In part 2, object pairs with the order (a, b) resulted in similar metaphorical interpretation scores (M = 0.29, SE = 0.03) as object pairs with the order (b, a) (M = 0.26, SE = 0.03), F (1, 72) = 0.79, p = .377, η^2 = 0.01.

As for modality, no main effects were found. In part 1, visually presented object pairs resulted in the same metaphorical interpretation scores (M = 0.06, SE = 0.02) as verbally presented object pairs (M = 0.04, SE = 0.02), F (1, 72) = 0.31, p = .579, η^2 = 0.00. In part 2, visually presented object pairs resulted in the similar metaphorical interpretation scores (M = 0.27, SE = 0.04) as verbally presented object pairs (M = 0.28, SE = 0.04), F (1, 72) = 0.06, p = .814, η^2 = 0.00.

Interpretation = No connection found

Participants' answers were coded as comparison, metaphorical interpretation, or no connection found, for both the first part (open answer question) and the second part (multiple choice question). Descriptive statistics for the mean scores for no connection found for all within-subjects variables, as a function of modality are given in Table 7.

Table 7

Experiment 2: means and standard deviations for no connection score in part I and part II, overall and as a function of modality (0: interpretation type was present in none of participants' answers – 1: interpretation type was present in all participants' answers).

Symmetry	Order	Modality	Mean score (*SD*) Part I	Mean score (*SD*) Part II	*N*
Symmetrical	(a, b)	visual	0.01 (0.04)	0.16 (0.28)	36
		verbal	0.01 (0.04)	0.11 (0.20)	38
	(b, a)	visual	0.03 (0.06)	0.17 (0.23)	36
		verbal	0.00 (0.03)	0.06 (0.16)	38
Asymmetrical	(a, b)	visual	0.17 (0.20)	0.33 (0.31)	36
		verbal	0.12 (0.17)	0.30 (0.30)	38
	(b, a)	visual	0.15 (0.19)	0.42 (0.34)	36
		verbal	0.18 (0.24)	0.38 (0.37)	38

In the first part of the questionnaire, participants wrote down their own interpretations of the connections between the objects. The results of the repeated measures ANOVA showed a significant main effect of symmetry on no connection found scores, F (1, 72) = 76.22, p < .001, η^2 = 0.51. Contrasts revealed that asymmetrical object pairs resulted in higher scores for no connection found (M = 0.15, SE = 0.02) than symmetrical object pairs (M = 0.01, SE = 0.003). In the second part of the questionnaire, where participants had to choose one of the

four given interpretations, a significant main effect of symmetry on no connection was found as well, F (1, 72) = 80.91, p < .001, η^2 = 0.53. Contrasts revealed that asymmetrical object pairs resulted in higher scores for no connection found (M = 0.36, SE = 0.03) than symmetrical object pairs (M = 0.13, SE = 0.02). The main effects of symmetry on no connection found scores in part 1 and part II of the questionnaire is shown in Figure 26.

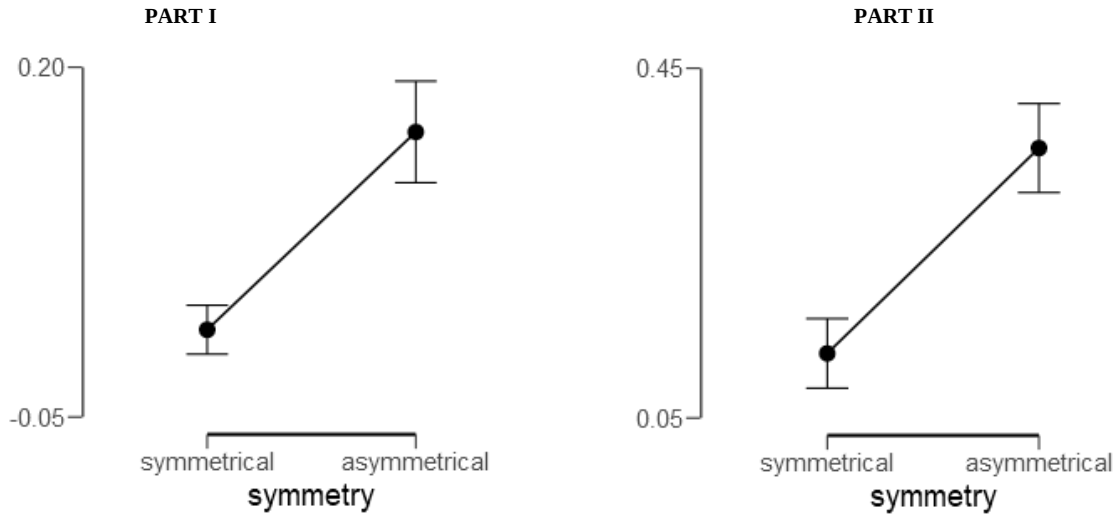


Figure 26. Experiment 2: mean scores interpretation of no connection found in part I (left) and part II (right), as a function of symmetry.

In the second part of the questionnaire, an interaction effect between symmetry and order on no connection scores was found, F (1, 72) = 4.01, p = .049, η^2 = 0.05. For symmetrical pairs, contrasts revealed that order (a, b) resulted in slightly higher scores for no connection found (M = 0.14, SE = 0.03) than order (b, a) (M = 0.11, SE = 0.02). For asymmetrical pairs, order (b, a) resulted in slightly higher scores for no connection found (M = 0.40, SE = 0.04) than order (a, b) (M = 0.32, SE = 0.04). The interaction effect between symmetry and order on no connection found is given in Figure 27.

No other significant effects were found. As for order, the repeated measures ANOVA did not reveal a significant main effect of order. In part 1, object pairs with the order (a, b) resulted in the same scores of no connection found (M = 0.08, SE = 0.01) as object pairs with the order (b, a) (M = 0.09, SE = 0.01), F (1, 72) = 0.41, p = .523, η^2 = 0.01. In part 2, object pairs with the order (a, b) resulted in similar no connection found scores (M = 0.23, SE = 0.03) as object pairs with the order (b, a) (M = 0.26, SE = 0.03), F (1, 72) = 1.21, p = .275, η^2 = 0.02.

As for modality, no main effects were found. In part 1, visually presented object pairs resulted in the same no connection found scores (M = 0.09, SE = 0.01) as verbally presented object pairs (M = 0.08, SE = 0.01), F (1, 72) = 0.44, p = .510, η^2 = 0.01. In part 2, visually presented object pairs resulted in the similar no connection found scores (M = 0.27, SE = 0.03) as verbally presented object pairs (M = 0.21, SE = 0.03), F (1, 72) = 1.58, p = .211, η^2 = 0.02.

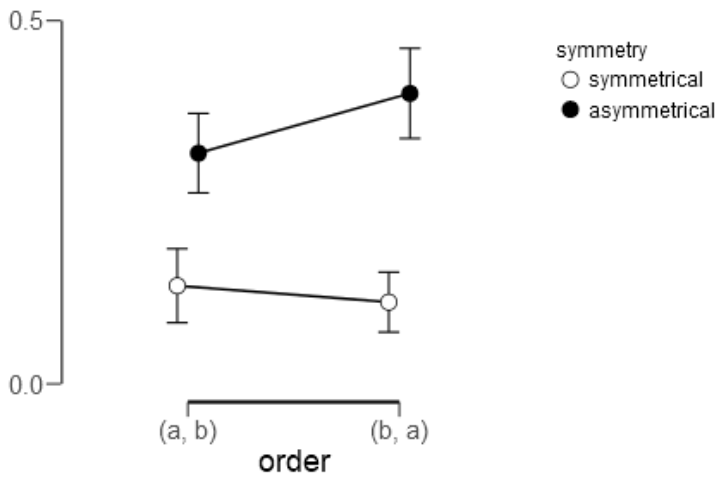


Figure 27. Experiment 2: mean scores interpretation of no connection found in part II, as a function of the interaction between symmetry and order.

Response Times

Descriptive statistics for the mean response times for all within-subjects variables, as a function of modality are given in Table 8.

It was hypothesized that expected symmetrical pairs would result in longer response times than expected asymmetrical pairs. The results of the ANOVA showed a significant main effect of symmetry on response times in the first part of the questionnaire, F (1, 72) = 35.95, p < .001, η^2 = 0.33. Contrasts revealed that symmetrical object pairs resulted in faster response times (M = 5113.12, SE = 443.71) than asymmetrical objects pairs (M = 7174.31, SE = 492.84). In the second part of the questionnaire, a significant main effect of symmetry on response times was found as well, although in a different direction. Contrasts revealed that in part 2, asymmetrical object pairs resulted in faster response times (M = 5732.97, SE = 273.96) than symmetrical objects pairs (M = 6476.45, SE = 331.62), F (1, 72) = 5.37, p = .023, η^2 = 0.07. The main effects of symmetry on response times in part 1 and part 2 of the questionnaire are shown in Figure 28.

Table 8

Experiment 2: means and standard deviations of response times (in msec) in part I and part II, overall and as a function of modality.

Symmetry	Order	Modality	Mean RT (*SD*) Part I	Mean RT (*SD*) Part II	*N*
Symmetrical	(a, b)	visual	7476 (4786)	6075 (2032)	36
		verbal	3213 (2506)	6808 (4461)	38
	(b, a)	visual	6287 (5790)	7055 (4968)	36
		verbal	3475 (3343)	5968 (2933)	38
Asymmetrical	(a, b)	visual	8975 (5749)	6520 (3300)	36
		verbal	5751 (4599)	5253 (2017)	38
	(b, a)	visual	9338 (6702)	5969 (2902)	36
		verbal	4633 (3025)	5190 (2629)	38

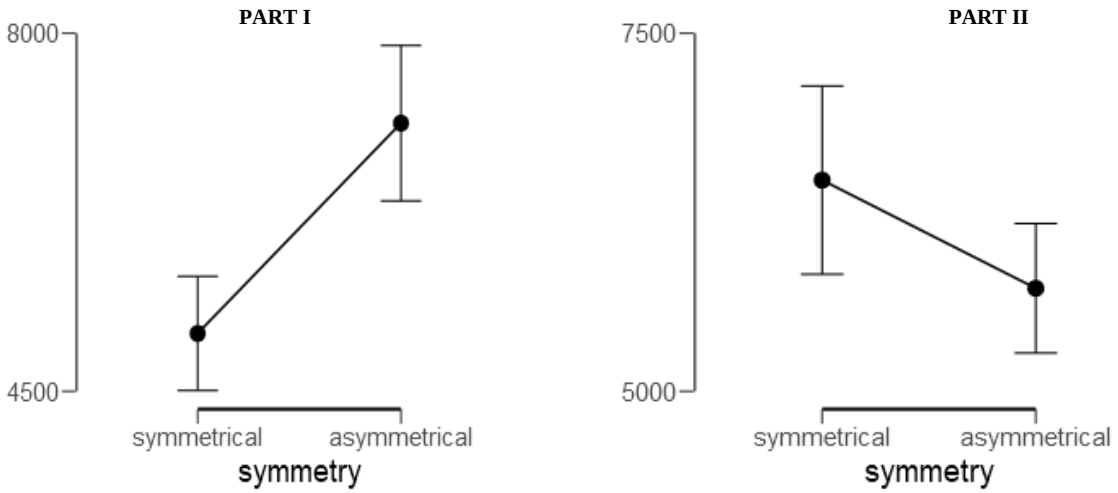


Figure 28. Experiment 2: mean response times in part I (left) and part II (right), as a function of symmetry.

For part 1, a significant main effect of modality on response times was found, F (1, 72) = 18.48, $p < .001$, $\eta^2 = 0.20$. Contrasts revealed that verbally presented object pairs resulted in faster response times (M = 4268.15, SE = 608.60) than visually presented object pairs (M = 8019.28, SE = 625.28). For part 2, no main effect of modality on response times was found. Verbally presented object pairs (M = 5804.48, SE = 360.54) resulted in similar response times as visually presented object pairs (M = 6404.95, SE = 370.42), F (1, 72) = 1.35, p = .249, η^2 =

0.02. The main effect of modality on response times that was found for part 1 is shown in Figure 29.

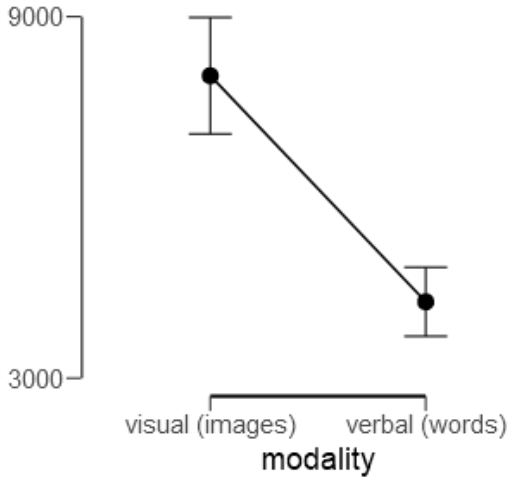


Figure 29. Experiment 2: mean response times in part I, as a function of modality.

As for order, no main effects were found. In part 1, object pairs with the order (a, b) resulted in similar response times (M = 6353.97, SE = 457.22) as object pairs with the order (b, a) (M = 5933.47, SE = 513.28), F (1, 72) = 0.96, p = .33, η^2 = 0.01. In part 2, object pairs with the order (a, b) also resulted in similar response times (M = 6163.92, SE = 284.12) as object pairs with the order (b, a) (M = 6045.51, SE = 323.32), F (1, 72) = 0.14, p = .714, η^2 = 0.002.

Discussion

In Experiment 2 participants were asked to find connections between objects in 16 different object pairs. Eight object pairs could be defined as asymmetrical, as based on the results of Experiment 1 of the present study. The other eight object pairs could be defined as symmetrical, also as based on the results of the first experiment. It was expected that asymmetrical object pairs would elicit metaphorical interpretations ([A = B] and [B = A]), and that symmetrical object pairs would elicit interpretations of comparison ([A is like B] and [B is like A]). Also, it was expected that order would affect type of interpretation. Furthermore, it was hypothesized that symmetrical object pairs would result in longer response times than asymmetrical object pairs. To compare verbal and visual object pairs, half of the participants saw the object pairs in images, the other half saw the object pairs in words.

The questionnaire consisted of two parts. In the first part, participants were asked to write down their own thoughts about the connections between the objects. By means of such an open answer question it can be revealed which features are salient for the participants, and

which display schemas and domain knowledge they use (Hegarty, 2011). In the second part, participants were asked to choose one of four given interpretations for the connections between the object pairs. Analyses were done separately for both parts.

The results showed that symmetrical object pairs were more often interpreted as comparisons than asymmetrical object pairs, confirming the first hypothesis. Although most participants interpreted the asymmetrical pairs as comparison, asymmetrical pairs elicited more metaphorical interpretations than symmetrical pairs, confirming the second hypothesis. A third difference between symmetrical and asymmetrical pairs became visible in the no connection scores; some participants could not find a connection between the objects in the asymmetrical pairs, more often than in symmetrical object pairs.

An interesting thing happened as for the response times. In the first part of the questionnaire, where participants had to write down their own thoughts about the connections between the object, participants spent less time on pages with symmetrical pairs than on pages with asymmetrical pairs. Presumably, they could faster find a connection between two consumer goods, e.g., *banana- bread*, resulting in an interpretation of comparison, than between a consumer good and something else, e.g., *dress- butterfly*. As noticed before, some participants could not even find a connection between the objects of the asymmetrical object pairs, which explains the long response times. For symmetrical object pairs, the connections might have been more salient. In the second part of the questionnaire however, participants spent more time on pages with symmetrical pairs than on pages with asymmetrical pairs. Regarding asymmetrical object pairs, participants had already seen each object pair in the first part which made it easier to access possible connections, especially when four options were given. Regarding symmetrical object pairs, the two answer options suggesting a metaphorical interpretation (e.g., *A bread is a banana* and *A banana is a bread*) might have distracted the participants because these interpretations differed from the more salient connections, resulting in longer response times.

In the second experiment, order did not affect type of interpretation. An explanation could be that most connections indicated an interpretation of comparison, in which the order of the objects does not seem to matter. Cross-domain mapping, i.e. metaphorical interpretations, almost did not occur. Without cross-domain mapping and a metaphorical interpretation, none of the objects was preferred as topic over the other object. Therefore, order could not affect the interpretation of symmetrical object pairs.

Response times were affected by modality in the first part of the questionnaire. Participants who were presented with the visual object pairs (drawn black and white images)

needed more time to find a connection than participants who were presented with the verbal object pairs (written words). When juxtaposed entities are presented in words, participants only have their own representations of the objects in their minds. This would probably make it easier to come up with connections. When the juxtaposed entities are presented in images, there is a lot more information to process. The images all have specific shapes, orientations and sizes, although we have tried to keep these features as similar as possible for all images. These explicit perceptual features might have distracted the participant in finding connections, resulting in longer response times. This would also explain why modality did not have an effect in the second part of the questionnaire, where participants were already familiar with the object pairs.

To conclude, Experiment 2 confirmed the differences between symmetrical and asymmetrical pairs, regarding the elicitation of interpretations of comparison and metaphorical interpretations. However, asymmetrical pairs still elicited more interpretations of comparison than metaphorical interpretations, probably due to the absence of a meaningful context. The last experiment of the present study will again investigate the cues of (a)symmetry, order and modality on the interpretation of juxtaposed entities again, but then within a given context.

Experiment 3

Introduction

Most advertisements are presented in visual form; billboards, TV commercials, pages in magazines, and brand names on trucks and in supermarkets. Apart from commercials on the radio, it is almost inevitable to not complement a verbal message with a visual design. In a study conducted by Ojha and Indurkhya (2016) it was found that priming verbal metaphors with explicit corresponding images facilitates comprehension, and that priming the source domain with images facilitates metaphor comprehension even more effectively than priming the target domain with images.

However strong the effects of visual information, verbal information could serve as cue as well in understanding juxtaposed entities. As for comic books and strips in which verbal and visual language are often present together, Cohn (2010) shows that the integration of text and image makes the strips meaningful. Without a verbal reference or cue, images in a strip would probably be interpreted different from the intended meaning or could not even be interpreted at all. The same holds for juxtaposed entities in political cartoons that can be

interpreted and understood in different ways as well, depending on the knowledge, cultural background and attitudes of the perceiver (Refaie, 2003). In order to end up with a correct interpretation of the political cartoon, verbal cues could provide the perceiver with relevant information about the intended topic of the message. The use of verbal cues could increase the comprehension and the appreciation of metaphors as well, as found in a study to metaphors in TV commercials (Van Enschot & Hoeken, 2015).

The display schema as described in the article written by Hegarty (2011), involves knowledge about different genres, such as advertisements. Dependent of the genre to which a message belongs, different entities could be interpreted as topic. Knowing that juxtaposed objects are part of an advertisement probably elicits more metaphorical interpretations compared to not having this knowledge.

Considering the existing literature about the effects of verbal cues and an advertising context on interpreting visually and verbally presented information, fictitious brand names and product categories will be added to the juxtaposed entities in Experiment 3 of the present study. The addition of context might increase the chance of elicited metaphorical interpretations, also for symmetrical pairs. Dissimilar to the hypotheses for Experiment1 and Experiment 2, for the third experiment it is expected that order does not affect which of the object is interpreted as topic, because the topic will already be given away by the brand name and product category. It is expected that the presence of the brand names will also result in similar response times for symmetrical and asymmetrical object pairs, because the brand names already give away the topic of the advertisement, which might make it easier to come up with a connection for all object pairs. To investigate the role of context, participant's interpretations of the object pairs from Experiments 2 and 3 will be compared. Regarding the role of different brand names in symmetrical pairs on the type of interpretation, it is expected that the form of the metaphorical interpretation [A = B] or [B = A] is affected by the brand name, respectively a brand name for object *a* or a brand name for object *b*. The hypotheses for Experiment 3 are as follows;

- Symmetrical pairs will result in interpretations of comparison between object *a* and object *b*;
- Asymmetrical pairs will result in metaphorical interpretations;
- Order of the objects will not affect type of interpretation, because a context is given;
- Response times will be similar for symmetrical pairs and asymmetrical pairs;

- Compared to the object pairs of Experiment 2, the object pairs in Experiment 3 will elicit more metaphorical interpretations, due to the contextual cue;
- If a symmetrical object pair is interpreted metaphorically, the brand name will affect the form of the metaphorical interpretation, [A = B] or [B = A].

Methods

Materials

The materials for the third experiment consisted of the same 16 object pairs that were used in Experiment 2 (see Appendix II), 8 symmetrical object pairs, e.g., *banana-bread*, and 8 asymmetrical object pairs, e.g., *bike-antelope*. Most objects that were used in the third experiment were consumer goods that frequently appear in advertisements (i.e., *bicycle, guitar, bathrobe, dress, mattress, speedboat, vacuum cleaner, hot sauce, banana, bed, beer, bread, tissue, air freshener, perfume,* and *tea*). In order to generalize the experiment's findings, objects from different price ranges were used; the objects ranged from affordable products like bread and bananas to more expensive products like mattresses and speedboats.

The objects that were juxtaposed with the consumer goods in asymmetrical pairs (i.e., *antelope, atomic bomb, feather, butterfly, cloud, swordfish, tornado,* and *hand grenade*), were animals, nature-related things and war-related human tools. These things cannot be bought by general consumers and are therefore no typical topics of advertisements. In contrast, the objects that were juxtaposed with the consumer goods in symmetrical pairs (i.e., *bread, sleeping bag, ice cream, orange, pillow, fan, detergent,* and *scarf*), were also things created by humans to be used in the house, and products that are oftentimes consumed and which can be bought in malls and supermarkets.

The objects used in Experiment 3 had similar concreteness ratings so that different levels of concreteness could not influence the results. The mean concreteness ratings were derived from a large study conducted by Brysbaert, Stevens, De Deyne, Voorspoels and Storms (2014). In this study rating norms for age of acquisition and concreteness were collected for 30.000 Dutch words. The concreteness ratings were measured on a five points scale (1: very abstract/ language based; 5: very concrete/experience based). For all objects that were used in Experiment 3, the mean concreteness ratings varied between 4.2 and 5.

Besides the 16 experimental stimuli, Experiment 3 contained 8 pairs of dissimilar objects functioning as fillers. The 8 filler pairs were *binocular-fridge, cow-dart arrow, duster-tent, steam iron-castle, octopus-car, tire-carrot, candy-lawnmower,* and *croissant-helmet*.

In order to provide the participants with a contextual cue, fictitious brand names were created. Because it is unrealistic to advertise for hand grenades, butterflies, and tornados, it was decided to only advertise for the consumer goods in the asymmetrical pairs. The fictitious brand names for the asymmetrical object pairs were; *Biclassics* (bicycles), *Elekaotic* (guitars), *Belladonna* (dresses), *Hestia* (bathrobes), *Sedna* (speedboats), *Swoosh* (vacuum cleaners), *Salsa Fiesta* (hot sauces), and *Nyxus* (mattresses).

Because the objects in the symmetrical pairs were all consumer goods, and therefore possible topics for an advertisement, a brand name was created for both objects. For the symmetrical object pairs, the fictitious brand names were; *Monkey Yum* (bananas), *Panemmm* (bread), *Granitum* (bread), *Pomonasin* (oranges), *Woods* (tea), *Freya Fashion* (scarves), *Odeur d'Olivier* (perfume), *Bisanin* (detergent), *Hopse Haeck* (beer), *Fanifun* (ice cream), *Berends* (beds), *Yukka* (sleeping bags), *Vanidex* (tissues), *Böhrum* (pillows), *Brozo* (air fresheners), and *Venticosy* (fans). For each symmetrical object pair in the questionnaire only one of the brand names was given, e.g., either *Monkey Yum (banana- bread)* or *Panemmm (banana- bread).*

For the filler pairs the fictitious brand names were; *Kaito* (binoculars), *Sadashi* (cars), *Banderti* (car tires), *Harrisson* (lawnmowers), *Abentus* (dart arrows), *Rödvarc* (tents), *Torstein* (steam irons), and *Guillaume* (croissants).

To strengthen the cue of an advertising context, all object pairs were surrounded by lines, resulting in a poster-like frame. The brand names, written in upper case, were placed in the right bottom corner of the frame, followed by the corresonding product category, written in lower case. Examples of the materials are given in Figures 30, 31, and 32.

Participants

Participation in the experiment was voluntarily. Most participants signed up for the questionnaire via the Tilburg University participant pool SONA. These participants were given 0.5 credit hours for their participation. Other participants were recruited via social media or were asked personally at the Radboud University in Nijmegen, and did not receive any form of compensation. 64 participants completed the questionnaire in Qualtrics, which on average took 23 minutes to be completed. The mean age of the participants was 27 years old (min. 18 - max. 64), and the male-female ratio was 25%-75%.

Design

The design of Experiment 3 was a 2x2x2(x2) mixed design, with **modality** as between factor (visual; verbal), and **order of objects** ((a, b) or (b, a)) **symmetry** (symmetrical; asymmetrical), and **brand name** (only for symmetrical pairs: object *a* or object *b*) as within factors.

Instrumentation

In part 1, each of the 16 object pairs and each of the 8 fillers were shown on a separate page. After participants had decided what the connection between the two objects was, or after they had decided that there was no connection, they could go on by clicking on >> in the right bottom corner of the screen (Bowdle & Gentner, 2005). On a second page participants were presented with the question *'What is the connection between these two objects?'* and a text box in which they could type down their answer. (The original question was in Dutch: *'Wat is de connectie tussen deze twee objecten?*').

In part 2, all object pairs and fillers were shown again in a randomized order, but with the same order of the objects within each pair. Again, they saw the question *'What is the connection between these two objects?*'. This time, the object pair and the question were shown on the same page. Participants had to choose one out of four answer options that suggested a connection between the two objects. In the case of the object pair *antelope-bike*, presented in images or words, the answer option were;

- An antelope is a bike
- A bike is an antelope
- I see an antelope and a bike / I see the words antelope and bike
- The objects are comparable

Response times were measured in milliseconds.

Procedure

All participants started at the welcome page. After this page they were randomly assigned to either the questionnaire with the stimuli presented in words, or the questionnaire with the stimuli presented in images. Similar to the first two experiments, within the two different modalities of Experiment 3 participants were randomly assigned to one of two lists that differed in order of the objects, e.g. *vacuum cleaner-tornado* versus *tornado-vacuum cleaner*. Moreover, within the two different orders of the symmetrical object pairs, participants either saw the brand name for the first object, or the brand name for the second object, e.g. *sleeping*

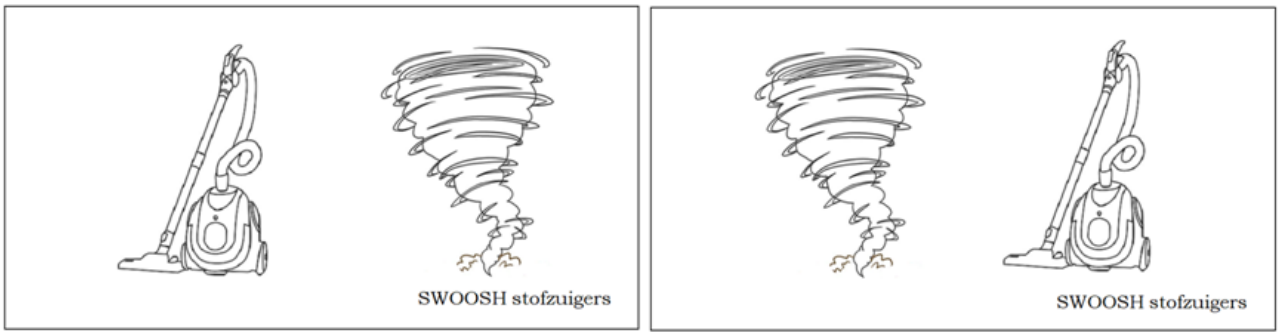
bag-bed (Berends beds) versus *sleeping bag-bed* (Yukka sleeping bags), and *bed-sleeping bag* (Berends beds) versus *bed-sleeping bag* (Yukka sleeping bags). In Figures 30, 31, and 32, examples of the different presentations of asymmetrical object pairs, filler object pairs and symmetrical object pairs are given. The object pairs were presented in randomized order to avoid bias.

At the instruction page participants were told that the questionnaire would consist of two parts. They were told that they would see 24 advertisements consisting of pairs of objects that were connected to one another, accompanied by the question *'What is the connection between these two objects?'*. In the instruction text participants were told that it could be possible that they would not find any connection between the objects. They were instructed to answer in whole sentences and to explicitly name both objects in their answer. A few examples of possible connections between an airplane and a swan and between a tomato and a rose were given.

After finishing part 1, participants were presented with another instruction page for part 2. They were told that they would see the same object pairs again, accompanied by the same question, but this time with four given answers out of which they had to choose one (*A vacuum cleaner is a tornado*, *A tornado is vacuum cleaner*, *I see a vacuum cleaner and a tornado*, and *A vacuum cleaner and a tornado are comparable*). Again, examples of *airplane-swan* and *tomato-rose* were given. At the end of the questionnaire, some general questions about age, gender, nationality, and current education level were asked.

Data analysis

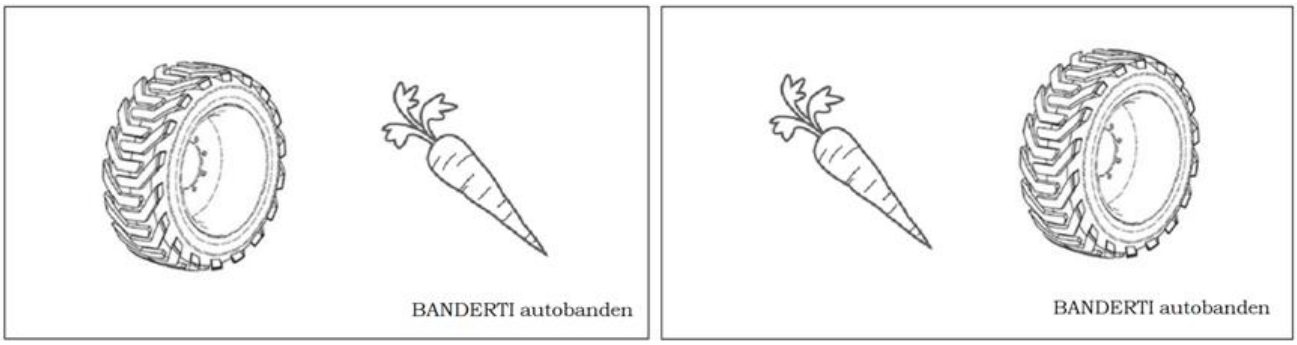
All participants' answers for both parts of the questionnaire were coded. When participants indicated that they could not find a connection, the answer was coded as 'no connection found'. Sometimes an odd connection was found, e.g., *"Tea picks often wear a scarf"*; these answers were coded as 'no connection found' as well. When participants clearly made a metaphorical interpretation, by using the words *'as (if)'* or by naming one of the object with a certain feature and subsequently applying this feature to the other object, the answer was coded as 'metaphorical'. When participants compared both objects on the same level, for instance by using the words *'both'*, the answer was coded as 'comparison'. All codings were checked by an independent coder. In cases of doubt, the first coder decided which coding category was chosen. The coding categories and some examples from the real data (part I) are given in Appendix V.



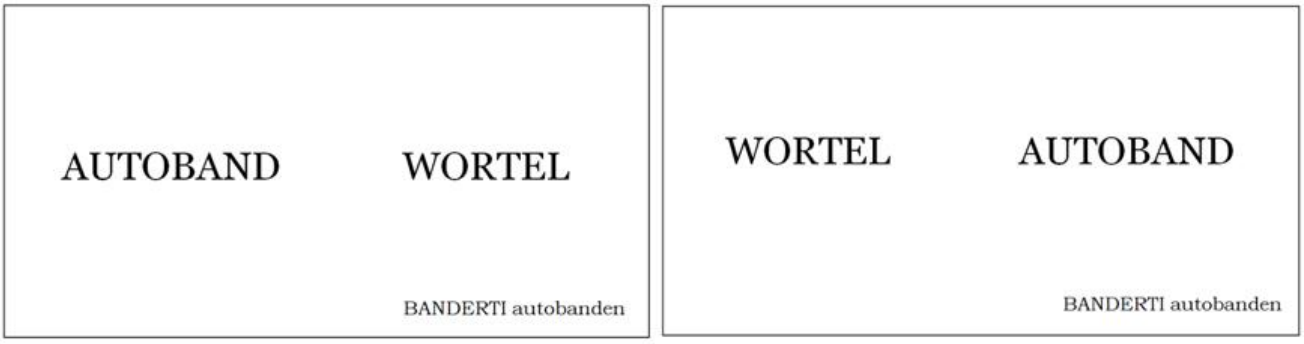
List 1 and 3 (images) *List 2 and 4 (images)*

List 1 and 3 (words) *List 2 and 4 (words)*

Figure 30. The four possible presentations of asymmetrical object pairs. Participants were assigned to a questionnaire with either images or words, and they saw one of two possible orders (*a*, *b*) or (*b*, *a*). For asymmetrical object pairs the brand name was always focused on the same object, i.e., the consumer good.



List 1 and 3 (images) *List 2 and 4 (images)*



List 1 and 3 (words) *List 2 and 4 (words)*

Figure 31. The four possible presentations of filler object pairs. Participants were assigned to a questionnaire with either images or words, and they saw one of two possible orders (*a*, *b*) or (*b*, *a*). For filler object pairs the brand name was always focused on one of the objects.

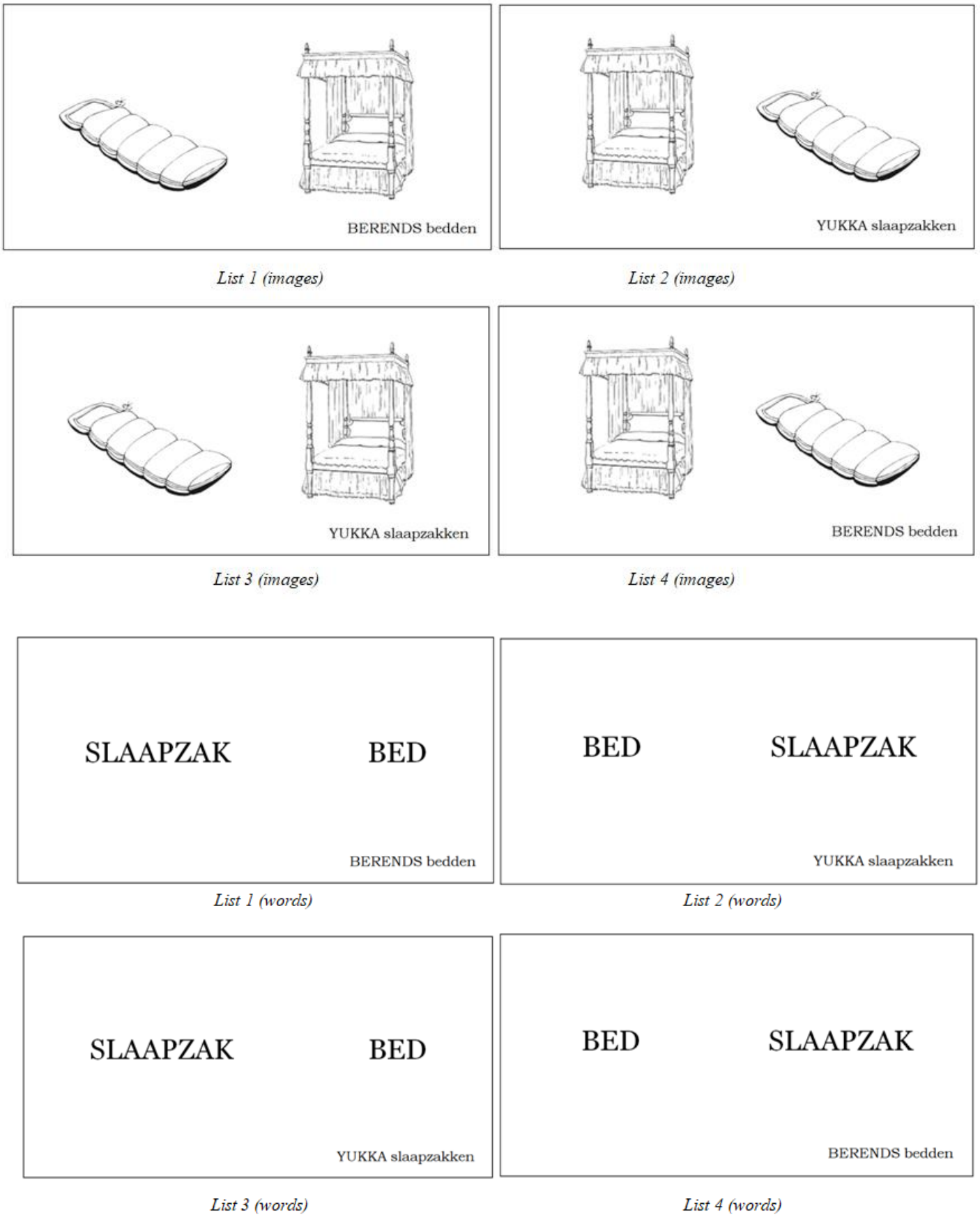


Figure 32. The eight possible presentations of symmetrical object pairs. Participants were assigned to a questionnaire with either images or words, and they saw one of two possible orders (*a*, *b*) or (*b*, *a*). Furthermore, for symmetrical object pairs, participants were presented with either a brand name for the first object (e.g., *Berends*) or a brand name for the second object (e.g., *Yukka*).

Similar to Experiment 2, the aim of Experiment 3 was to further gauge the effects of (a)symmetry and order on the interpretation of juxtaposed entities, this time within an advertising context. For each condition, mean scores of presence percentage for all interpretation types were measured to calculate to what degree the interpretation categories (interpretation of comparison, no connection, or metaphorical interpretation) were manifested in participants' answers (0: interpretation type was present in none of participants' answers – 1: interpretation type was present in all participants' answers). For instance, when a participant made a metaphorical connection two times out of four asymmetrical pairs in order (a, b), the mean score for metaphorical interpretation for condition asymmetrical (a, b) for this participant was 0,5.

To measure interpretation type and response times of 16 different object pairs, 2x2x2 repeated measures ANOVA's were conducted with **symmetry** (symmetrical; asymmetrical) and **order** ((a, b); (b, a)) as within-subject factors and **modality** (visual; verbal) as between-subjects factor.

To measure whether the presence of an advertising context is beneficial for metaphorical interpretations, a 2x2x2 repeated measures ANOVA was conducted with **symmetry** (symmetrical; asymmetrical) and **order** ((a, b); (b, a)) as within-subject factors and **context** (not given; given) as between-subjects factor.

To measure the effect of context, i.e., the presence of a brand name, on the form of metaphorical interpretation of symmetrical object pairs in Experiment 3 in more detail, a 2x2x2 repeated measures ANOVA was conducted with **order** ((a, b); (b, a)) and **brand name** (brand name for object *a*; brand name or object *b*) as within-subject factors, and **modality** (visual; verbal) as between-subjects factor. All analyses were done by means of the statistical program JASP.

Results

Frequency tables with total scores for Experiment 3.1 and 3.2 are given in Table 21, 22, 23, 24, 25 and 26 in Appendix III. The analyses were conducted with the mean scores of all interpretation types for each condition.

Interpretation = Comparison

Participants' answers were coded as comparison, metaphorical interpretation, or no connection found, for both the first part (open answer question) and the second part (multiple

choice question). Descriptive statistics for the mean scores for an interpretation of comparison for all within-subjects variables, as a function of modality are given in Table 9.

Table 9

Experiment 3: means and standard deviations for comparison score in part I and part II, overall and as a function of modality (0: interpretation type was present in none of participants' answers – 1: interpretation type was present in all participants' answers).

Symmetry	Order	Modality	Mean score (*SD*) Part I	Mean score (*SD*) Part II	*N*
Symmetrical	(a, b)	visual	0.75 (0.30)	0.46 (0.35)	32
		verbal	0.84 (0.28)	0.57 (0.28)	32
	(b, a)	visual	0.71 (0.36)	0.55 (0.31)	32
		verbal	0.84 (0.27)	0.57 (0.33)	32
Asymmetrical	(a, b)	visual	0.57 (0.34)	0.31 (0.29)	32
		verbal	0.53 (0.34)	0.31 (0.30)	32
	(b, a)	visual	0.63 (0.37)	0.26 (0.31)	32
		verbal	0.50 (0.35)	0.35 (0.27)	32

It was hypothesized that symmetrical pairs would result in interpretations of comparison between object *a* and object *b* more often than asymmetrical pairs. In the first part of the questionnaire, participants wrote down their own interpretations of the connections between the objects. The results of the repeated measures ANOVA showed a significant main effect of symmetry on interpretation of comparison, F (1, 62) = 67.34, $p < .001$, $\eta^2 = 0.48$. Contrasts revealed that symmetrical object pairs resulted in higher scores for comparison interpretations (M = 0.79, SE = 0.03) than asymmetrical object pairs (M = 0.56, SE = 0.04). In the second part of the questionnaire, where participants had to choose one of the four given interpretations, a significant main effect of symmetry on interpretation of comparison was also found, F (1, 62) = 44.82, $p < .001$, $\eta^2 = 0.42$. Symmetrical object pairs resulted in higher scores for comparison interpretations (M = 0.54, SE = 0.04) than asymmetrical object pairs (M = 0.31, SE = 0.03). The main effects of symmetry on comparison scores in part 1 and part 2 of the questionnaire are shown in Figure 33.

In the first part of the questionnaire, a significant interaction was found between symmetry and modality, F (1, 62) = 12.37, p = .001, $\eta^2 = 0.09$. Contrasts revealed that the differences between symmetrical pairs (M = 0.84, SE = 0.05) and asymmetrical pairs (M =

0.52, *SE* = 0.06) in the verbal modality were larger than the differences between symmetrical pairs (*M* = 0.73, *SE* = 0.05) and asymmetrical pairs (*M* = 0.60, *SE* = 0.06) in the visual modality. The interaction effect between symmetry and modality is shown in Figure 34.

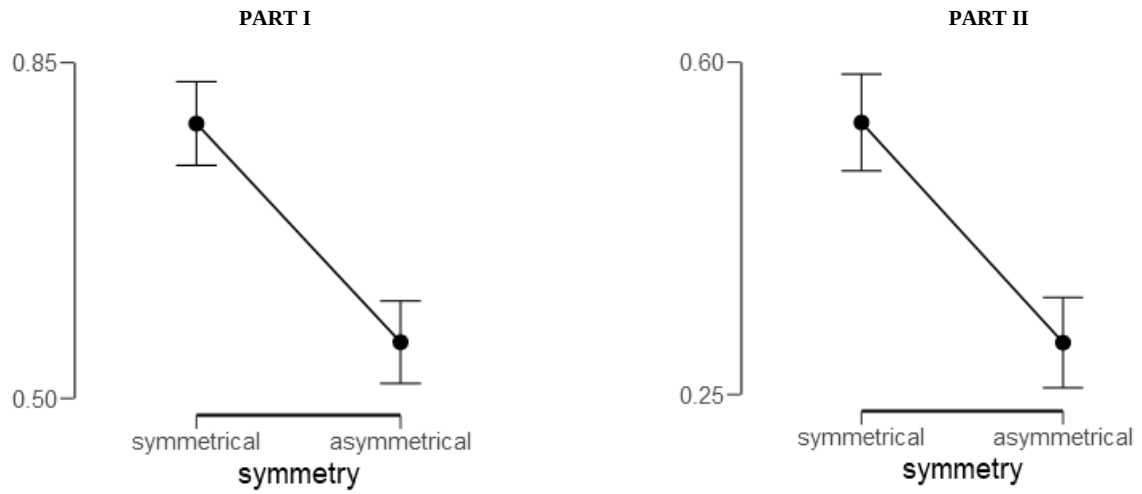


Figure 33. Experiment 3: mean scores interpretation of comparison in part I (left) and part II (right), as a function of symmetry.

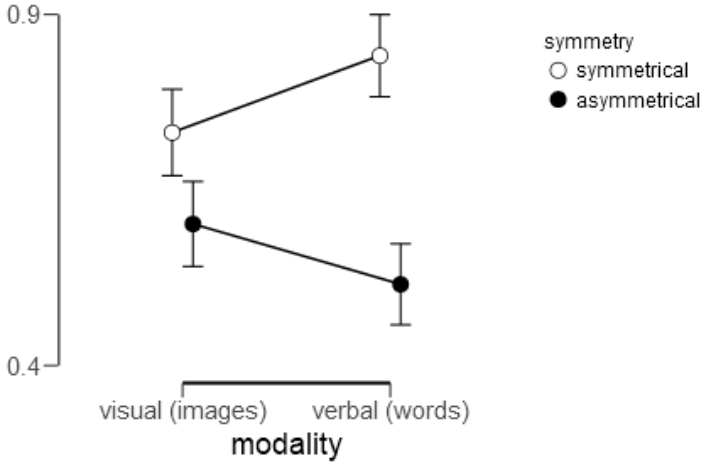


Figure 34. Experiment 3: mean scores interpretation of comparison in part I of the questionnaire, as a function of the interaction between symmetry and modality.

No other significant effects were found. As for order, the repeated measures ANOVA did not reveal a significant main effect of order. In part 1, object pairs with the order (a, b) resulted in the same scores of comparison (*M* = 0.67, *SE* = 0.04) as object pairs with the order (b, a) (*M* = 0.67, *SE* = 0.04), *F* (1, 62) = 0.01, *p* = .906, η^2 = 0.00. In part 2, object pairs with the order (a, b) resulted in the same comparison scores (*M* = 0.41, *SE* = 0.03) as object pairs with the order (b, a) (*M* = 0.43, *SE* = 0.03), *F* (1, 62) = 0.65, *p* = .425, η^2 = 0.01.

As for modality, no main effects were found. In part 1, visually presented object pairs resulted in the same comparison scores (M = 0.67, SE = 0.05) as verbally presented object pairs (M = 0.68, SE = 0.05), F (1, 62) = 0.03, p = .868, η^2 = 0.00. In part 2, visually presented object pairs resulted in the similar comparison scores (M = 0.39, SE = 0.04) as verbally presented object pairs (M = 0.45, SE = 0.04), F (1, 62) = 0.90, p = .346, η^2 = 0.01.

Interpretation = Metaphorical

Participants' answers were coded as comparison, metaphorical interpretation, or no connection found, for both the first part (open answer question) and the second part (multiple choice question). Descriptive statistics for the mean scores for a metaphorical interpretation for all within-subjects variables, as a function of modality are given in Table 10.

Table 10

Experiment 3: means and standard deviations for metaphorical interpretation score in part I and part II, overall and as a function of modality (0: interpretation type was present in none of participants' answers – 1: interpretation type was present in all participants' answers).

Symmetry	Order	Modality	Mean score (*SD*) Part I	Mean score (*SD*) Part II	*N*
Symmetrical	(a, b)	visual	0.17 (0.26)	0.34 (0.33)	32
		verbal	0.14 (0.28)	0.30 (0.24)	32
	(b, a)	visual	0.25 (0.36)	0.31 (0.29)	32
		verbal	0.12 (0.23)	0.30 (0.23)	32
Asymmetrical	(a, b)	visual	0.31 (0.35)	0.48 (0.36)	32
		verbal	0.34 (0.35)	0.42 (0.38)	32
	(b, a)	visual	0.30 (0.37)	0.50 (0.38)	32
		verbal	0.34 (0.42)	0.32 (0.36)	32

It was hypothesized that asymmetrical pairs would result in metaphorical interpretations more often than symmetrical pairs. In the first part of the questionnaire, participants wrote down their own interpretations of the connections between the objects. The results of the repeated measures ANOVA showed a significant main effect of symmetry on metaphorical interpretation, F (1, 62) = 34.41, p < .001, η^2 = 0.34. Contrasts revealed that asymmetrical object pairs resulted in higher scores for metaphorical interpretation (M = 0.32, SE = 0.04) than symmetrical object pairs (M = 0.17, SE = 0.03). In the second part of the questionnaire,

where participants had to choose one of the four given interpretations, a significant main effect of symmetry on metaphorical interpretation was found as well, F (1, 62) = 13.35, p < .001, η^2 = 0.17. Asymmetrical object pairs resulted in higher scores for metaphorical interpretation (M = 0.43, SE = 0.04) than symmetrical object pairs (M = 0.31, SE = 0.03). The main effects of symmetry on metaphorical interpretation in part 1 and part II of the questionnaire is shown in Figure 35.

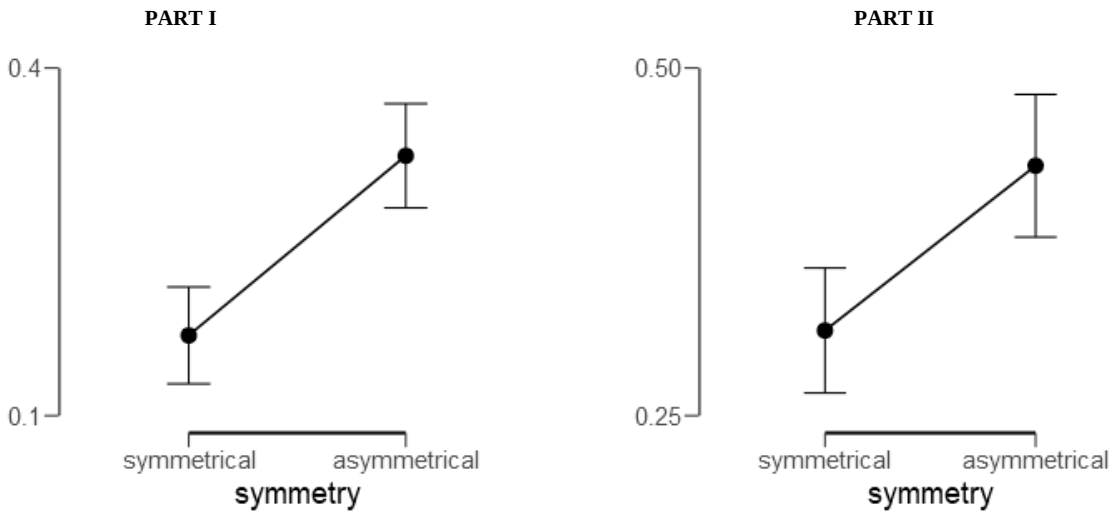


Figure 35. Experiment 3: mean scores interpretation of metaphorical interpretation in part I (left) and part II (right), as a function of symmetry.

No other significant effects were found. As for order, the repeated measures ANOVA did not reveal a significant main effect of order. In part 1, object pairs with the order (a, b) resulted in the same scores of metaphorical interpretation (M = 0.24, SE = 0.04) as object pairs with the order (b, a) (M = 0.25, SE = 0.04), F (1, 62) = 0.11, p = .743, η^2 = 0.00. In part 2, object pairs with the order (a, b) resulted in similar metaphorical interpretation scores (M = 0.36, SE = 0.03) as object pairs in the order (b, a) (M = 0.39, SE = 0.04), F (1, 62) = 1.19, p = .280, η^2 = 0.02.

As for modality, no main effects were found. In part 1, visually presented object pairs resulted in the same metaphorical interpretation scores (M = 0.26, SE = 0.05) as verbally presented object pairs (M = 0.24, SE = 0.05), F (1, 62) = 0.10, p = .756, η^2 = 0.00. In part 2, visually presented object pairs resulted in the similar metaphorical interpretation scores (M = 0.41, SE = 0.05) as verbally presented object pairs (M = 0.33, SE = 0.05), F (1, 62) = 1.24, p = .270, η^2 = 0.02.

Interpretation = No connection found

Participants' answers were coded as comparison, metaphorical interpretation, or no connection found, for both the first part (open answer question) and the second part (multiple choice question). Descriptive statistics for the mean scores for no connection found for all within-subjects variables, as a function of modality are given in Table 11.

Table 11

Experiment 3: means and standard deviations for no connection score in part I and part II, overall and as a function of modality (0: interpretation type was present in none of participants' answers – 1: interpretation type was present in all participants' answers).

Symmetry	Order	Modality	Mean score (*SD*) Part I	Mean score (*SD*) Part II	*N*
Symmetrical	(a, b)	visual	0.08 (0.17)	0.19 (0.21)	32
		verbal	0.02 (0.05)	0.14 (0.19)	32
	(b, a)	visual	0.04 (0.13)	0.15 (0.22)	32
		verbal	0.05 (0.11)	0.14 (0.21)	32
Asymmetrical	(a, b)	visual	0.12 (0.18)	0.22 (0.28)	32
		verbal	0.13 (0.18)	0.27 (0.34)	32
	(b, a)	visual	0.07 (0.15)	0.24 (0.30)	32
		verbal	0.16 (0.19)	0.33 (0.33)	32

In the first part of the questionnaire, participants wrote down their own interpretations of the connections between the objects. The results of the repeated measures ANOVA showed a significant main effect of symmetry on no connection found scores, F (1, 62) = 16.18, p < .001, η^2 = 0.20. Contrasts revealed that asymmetrical object pairs resulted in higher scores for no connection found (M = 0.12, SE = 0.02) than symmetrical object pairs (M = 0.04, SE = 0.01). In the second part of the questionnaire, where participants had to choose one of the four given interpretations, a significant main effect of symmetry on no connection was found as well, F (1, 62) = 18.21, p < .001, η^2 = 0.22. Contrasts revealed that asymmetrical object pairs resulted in higher scores for no connection found (M = 0.27, SE = 0.04) than symmetrical object pairs (M = 0.15, SE = 0.02). The main effects of symmetry on no connection found scores in part 1 and part II of the questionnaire is shown in Figure 36.

In the first part of the questionnaire, an interaction effect between symmetry and modality on no connection scores was found, F (1, 62) = 4.05, p = .049, η^2 = 0.05. Contrasts

revealed that the differences between symmetrical pairs (*M* = 0.03, *SE* = 0.02) and asymmetrical pairs (*M* = 0.14, *SE* = 0.02) in the verbal modality were larger than the differences between symmetrical pairs (*M* = 0.06, *SE* = 0.02) and asymmetrical pairs (*M* = 0.09, *SE* = 0.02) in the visual modality. The interaction effect between symmetry and modality on no connection found is given in Figure 37.

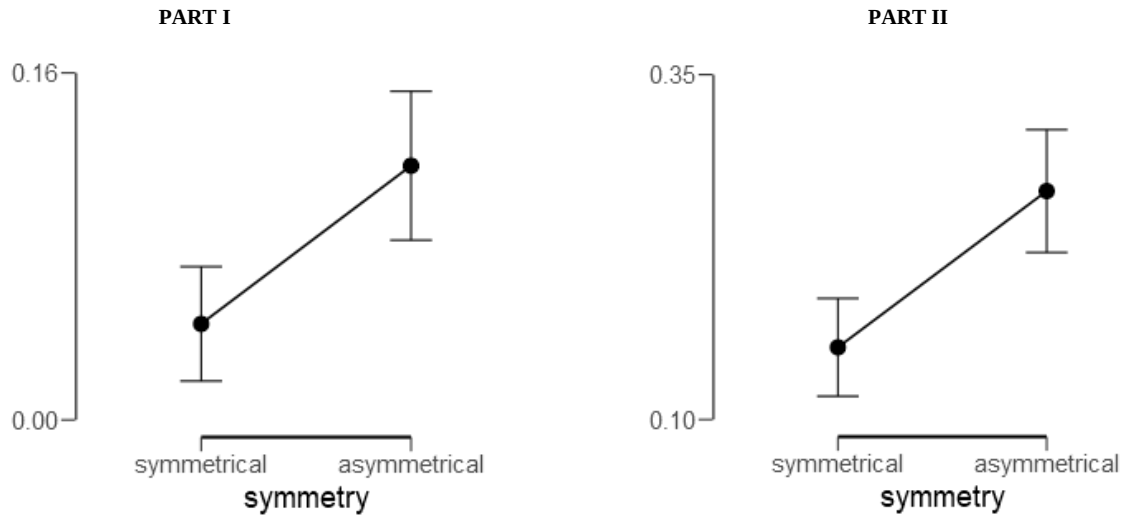


Figure 36. Experiment 3: mean scores interpretation of no connection found in part I (left) and part II (right), as a function of symmetry.

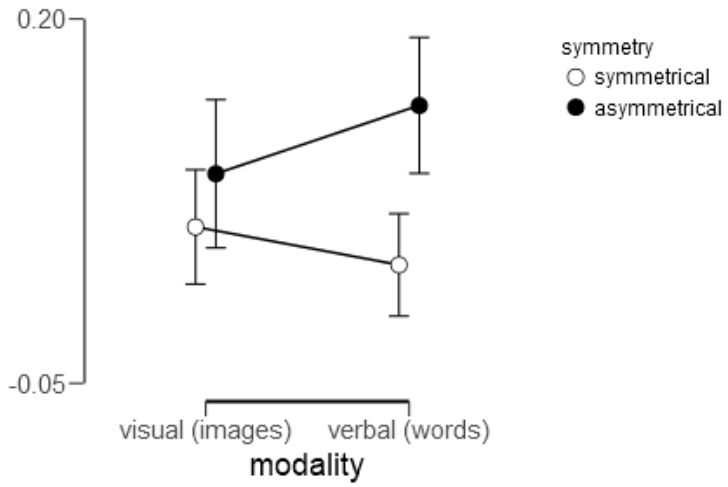


Figure 37. Experiment 3: mean scores interpretation of no connection found in part I, as a function of the interaction between symmetry and modality.

Another interaction effect was found in the first part of the questionnaire, i.e., between order and modality on no connection scores, F (1, 62) = 4.42, p = .040, η^2 = 0.07. Contrasts revealed that the order (a, b) resulted in higher scores for no connection found (*M* = 0.10, *SE*

= 0.02) than the order (b, a) (*M* = 0.05, *SE* = 0.02) in the visual modality, while in the verbal modality, the order (b, a) resulted in higher scores for no connection found (*M* = 0.10, *SE* = 0.02) than the order (a, b) (*M* = 0.07, *SE* = 0.02). The interaction effect between order and modality on no connection found is given in Figure 38.

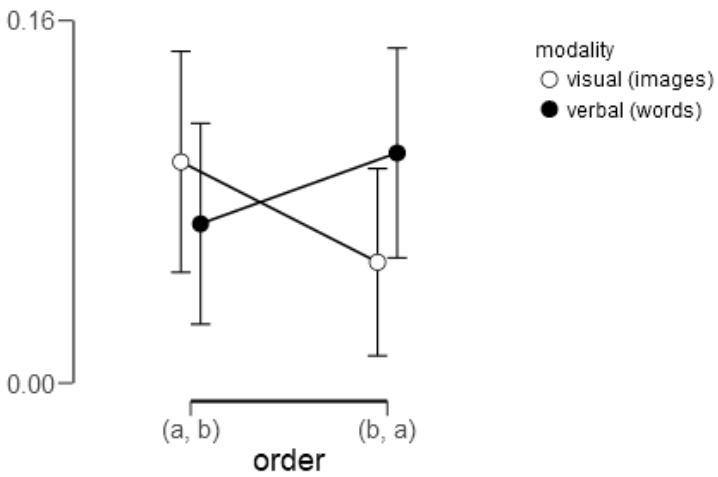


Figure 38. Experiment 3: mean scores interpretation of no connection found in part I, as a function of the interaction between order and modality.

No other significant effects were found. As for order, the repeated measures ANOVA did not reveal a significant main effect of order. In part 1, object pairs with the order (a, b) resulted in the same scores of no connection found (*M* = 0.08, *SE* = 0.01) as object pairs in the order (b, a) (*M* = 0.08, *SE* = 0.01), F (1, 62) = 0.13, p = .718, η^2 = 0.00. In part 2, object pairs with the order (a, b) resulted in similar no connection found scores (*M* = 0.21, *SE* = 0.03) as object pairs in the order (b, a) (*M* = 0.21, *SE* = 0.03), F (1, 62) = 0.10, p = .758, η^2 = 0.00.

As for modality, no main effects were found. In part 1, visually presented object pairs resulted in the same no connection found scores (*M* = 0.08, *SE* = 0.02) as verbally presented object pairs (*M* = 0.09, *SE* = 0.02), F (1, 62) = 0.23, p = .635, η^2 = 0.00. In part 2, visually presented object pairs resulted in the similar no connection found scores (*M* = 0.20, *SE* = 0.04) as verbally presented object pairs (*M* = 0.22, *SE* = 0.04), F (1, 62) = 0.12, p = .731, η^2 = 0.00.

Response Times

Descriptive statistics for the mean response times for all within-subjects variables, as a function of modality are given in Table 12.

It was hypothesized that symmetrical pairs would result in similar response times as asymmetrical pairs. No main effects were found. As for symmetry, symmetrical object pairs

resulted in similar response times (*M* = 9127.69, *SE* = 1077.65) as asymmetrical objects pairs (*M* = 10734.46, *SE* = 1466.20) in the first part of the questionnaire, *F* (1, 62) = 1.45, *p* = .233, η^2 = 0.02. In the second part of the questionnaire, symmetrical object pairs also resulted in similar response times (*M* = 7797.72, *SE* = 466.92) as asymmetrical objects pairs (*M* = 8288.42, *SE* = 502.32), *F* (1, 62) = 0.89, *p* = .350, η^2 = 0.01.

Table 12

Experiment 3: means and standard deviations of response times (in msec) in part I and part II, overall and as a function of modality.

Symmetry	Order	Modality	Mean RT (*SD*) Part I	Mean RT (*SD*) Part II	*N*
Symmetrical	(a, b)	visual	7177 (3557)	7890 (3923)	32
		verbal	11056 (19044)	7116 (4426)	32
	(b, a)	visual	10690 (8824)	9009 (5204)	32
		verbal	7588 (7493)	7176 (3520)	32
Asymmetrical	(a, b)	visual	11073 (8574)	7701 (2693)	32
		verbal	9773 (11609)	8468 (6526)	32
	(b, a)	visual	14994 (26716)	8499 (5441)	32
		verbal	7098 (6379)	8485 (4009)	32

As for order in part 1, object pairs with the order (a, b) resulted in similar response times (*M* = 9769.69, *SE* = 1392.18) as object pairs with the order (b, a) (*M* = 10092.45, *SE* = 1429.04), *F* (1, 62) = 0.03, *p* = .856, η^2 = 0.001. In part 2, object pairs with the order (a, b) resulted in similar response times (*M* = 7793.89, *SE* = 434.02) as object pairs with the order (b, a) (*M* = 8292.25, *SE* = 481.27) as well, *F* (1, 62) = 1.46, *p* = .232, η^2 = 0.02.

No main effects of modality were found for part 1, *F* (1, 62) = 0.91, *p* = .343, η^2 = 0.02. Verbally presented object pairs resulted in similar response times (*M* = 8878.83, *SE* = 1556.16) as visually presented object pairs (*M* = 10983.31, *SE* = 1556.16). Also for part 2, no main effect of modality was found. Verbally presented object pairs resulted in similar response times (*M* = 7811.35, *SE* = 578.54) as visually presented object pairs (*M* = 8274.78, *SE* = 578.54), *F* (1, 62) = 0.32, *p* = .573, η^2 = 0.01.

Context versus no context

To measure whether the addition of an advertising context increases the chance on metaphorical interpretations, the mean scores for metaphorical interpretation for Experiment 2 and Experiment 3 were compared. Descriptive statistics for the mean scores for metaphorical interpretation for all within-subjects variables, as a function of context are given in Table 13.

Table 13

Experiment 2 and 3: means and standard deviations for metaphorical interpretation score in part I and part II, overall and as a function of context given or not (0: interpretation type was present in none of participants' answers – 1: interpretation type was present in all participants' answers).

Symmetry	Order	Context	Mean score (*SD*) Part I	Mean score (*SD*) Part II	*N*
Symmetrical	(a, b)	Not given	0.02 (0.11)	0.27 (0.28)	74
		Given	0.16 (0.27)	0.32 (0.29)	64
	(b, a)	Not given	0.03 (0.14)	0.26 (0.31)	74
		Given	0.18 (0.31)	0.30 (0.26)	64
Asymmetrical	(a, b)	Not given	0.08 (0.20)	0.30 (0.31)	74
		Given	0.33 (0.35)	0.45 (0.37)	64
	(b, a)	Not given	0.07 (0.20)	0.26 (0.33)	74
		Given	0.32 (0.39)	0.41 (0.38)	64

Similar to the results of the separate analyses of Experiment 2 and Experiment 3, a significant main effect of symmetry on metaphorical interpretation score in the first part of the questionnaire was found, F (1, 136) = 43.92, $p < .001$, $\eta^2 = 0.23$. Contrasts revealed that asymmetrical object pairs resulted in higher scores for metaphorical interpretation ($M = 0.20$, $SE = 0.02$) than symmetrical object pairs ($M = 0.10$, $SE = 0.02$). Also in the second part of the questionnaire, a main effect of symmetry on metaphorical interpretation score was found, F (1, 136) = 10.79, $p = .001$, $\eta^2 = 0.07$. Asymmetrical object pairs resulted in higher scores for metaphorical interpretation ($M = 0.36$, $SE = 0.03$) than symmetrical object pairs ($M = 0.29$, $SE = 0.02$). The main effects of symmetry on metaphorical interpretation in part 1 and part 2 of both questionnaires are shown in Figure 39.

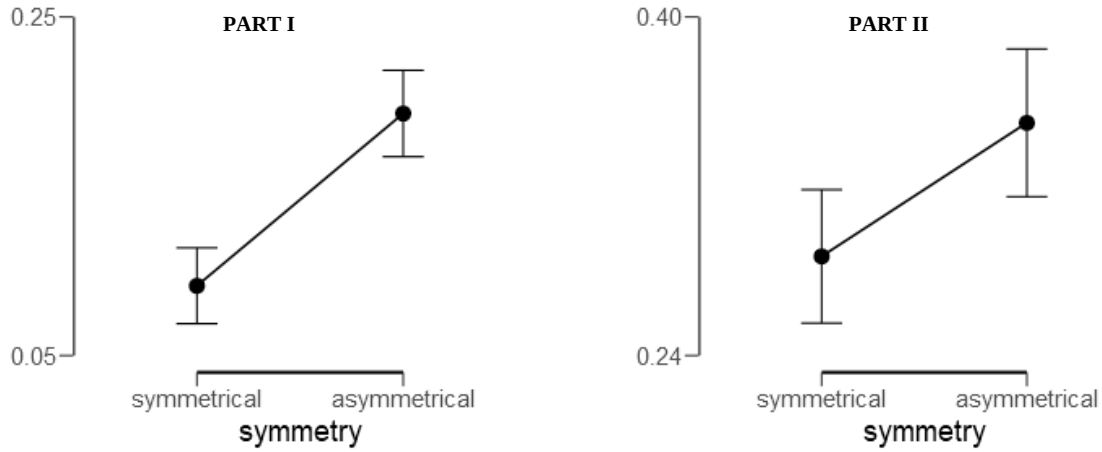


Figure 39. Comparing Experiment 2 and 3: mean scores for metaphorical interpretation in part I (left) and part II (right), as a function of symmetry.

It was hypothesized that objects pairs within a given context (Experiment 3) would result in metaphorical interpretations more often than object pairs without a given context (Experiment 2). For both parts of the questionnaires, main effects of context were found. In part I of the questionnaire, object pairs presented within an advertising context resulted in higher scores for metaphorical interpretation (M = 0.25, SE = 0.03) than object pairs that were not presented in a given context (M = 0.05, SE = 0.03), F (1, 136) = 28.52, $p < .001$, $\eta^2 = 0.17$. In part II of the questionnaire, object pairs presented within an advertising context resulted in higher scores for metaphorical interpretation (M = 0.37, SE = 0.03) than object pairs that were not presented in a given context (M = 0.27, SE = 0.03), F (1, 136) = 5.33, p = .022, $\eta^2 = 0.04$. The main effects of context on metaphorical interpretation in part 1 and part 2 of both questionnaires are shown in Figure 40.

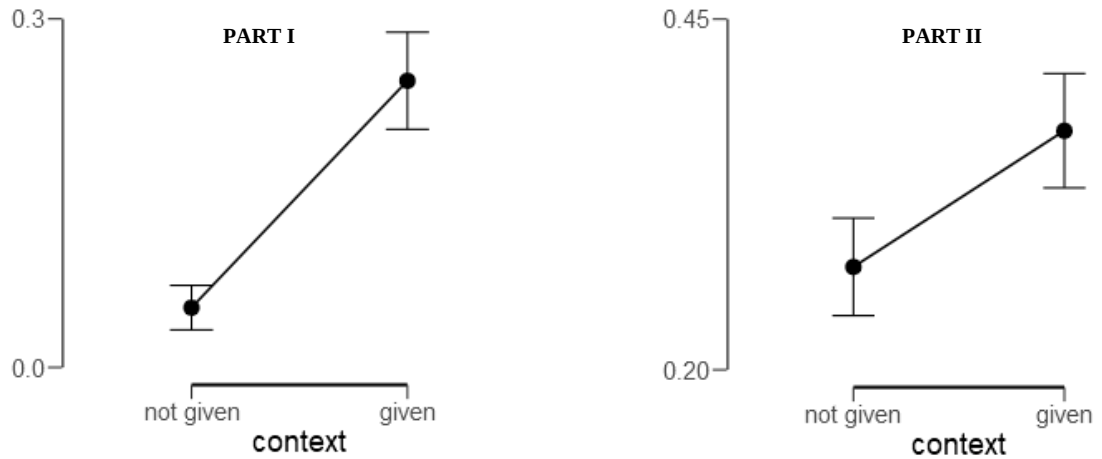


Figure 40. Comparing Experiment 2 and 3: mean scores for metaphorical interpretation in part I (left) and part II (right), as a function of context.

For both parts of the questionnaire, an interaction effect was found between symmetry and context. In part I: the differences between symmetrical pairs (M = 0.17, SE = 0.03) and asymmetrical pairs (M = 0.32, SE = 0.03) within a given context were larger than the differences between symmetrical pairs (M = 0.02, SE = 0.02) and asymmetrical pairs (M = 0.08, SE = 0.03) with no given context, F (1, 136) = 9.74, p = .002, η^2 = 0.05. In part II: the differences between symmetrical pairs (M = 0.31, SE = 0.03) and asymmetrical pairs (M = 0.43, SE = 0.04) within a given context were larger than the differences between symmetrical pairs (M = 0.27, SE = 0.03) and asymmetrical pairs (M = 0.28, SE = 0.04) with no given context, F (1, 136) = 6.44, p = .012, η^2 = 0.04. The interaction effects between symmetry and context on metaphorical interpretation in part 1 and part II are shown in Figure 41.

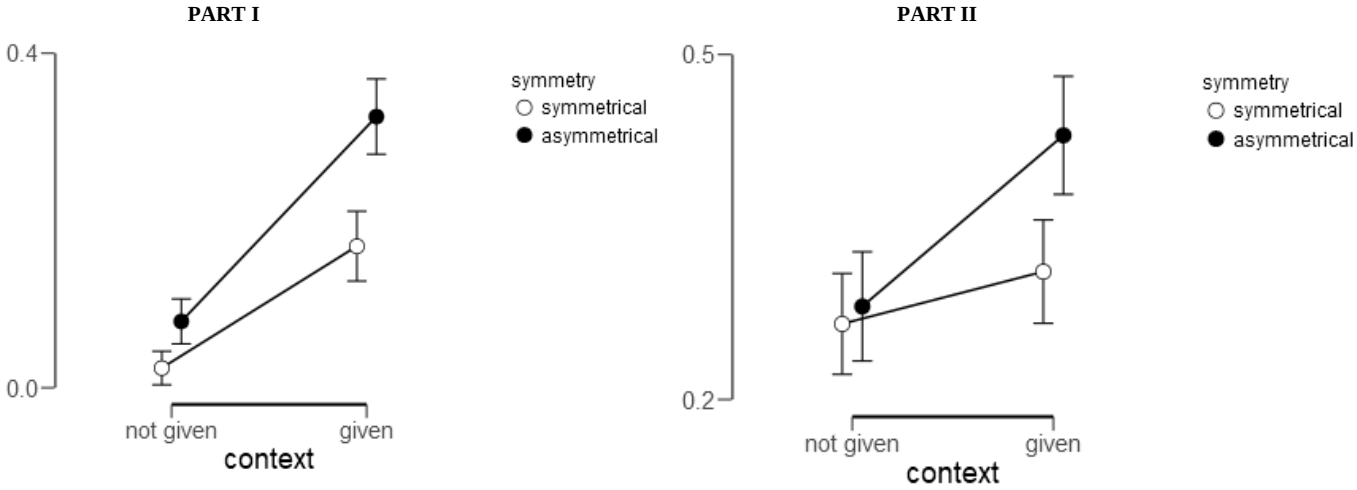


Figure 41. Comparing Experiment 2 and 3: mean scores for metaphorical interpretation in part I (left) and part II (right), as a function of the interaction between symmetry and context.

In both parts of the questionnaire, no main effects of order were found. Object pairs in order (a, b) resulted in a similar metaphorical interpretation scores (M = 0.15, SE = 0.02) as object pairs in the order (b, a) (M = 0.15, SE = 0.02) in the first part of the questionnaires, F (1, 136) = 0.07, p = .798, η^2 = 0.00. In the second part of the questionnaires, object pairs in order (a, b) resulted in a similar scores of metaphorical interpretation (M = 0.34, SE = 0.02) as object pairs in the order (b, a) (M = 0.31, SE = 0.02), F (1, 136) = 1.91, p = .169, η^2 = 0.01.

Brand names in symmetrical object pairs, metaphorical interpretation form [A = B]

To measure the effect of brand name on the form of the metaphorical interpretation of symmetrical object pairs, participants' answers were coded as a metaphorical interpretation in the form [A = B] or [B = A]. Descriptive statistics for the mean scores for a metaphorical

interpretation in the form [A = B] for all within-subjects variables, as a function of modality and form of interpretation are given in Table 14.

Table 14

Experiment 3 symmetrical pairs: mean scores for metaphorical interpretation in the form [A = B] in part I and part II of the questionnaire (SD in parentheses).

Order	Brand name	Modality	Mean score (*SD*) Part I	Mean score (*SD*) Part II	*N*
(a, b)	a	visual	0.12 (0.26)	0.16 (0.29)	32
		verbal	0.14 (0.32)	0.12 (0.28)	32
	b	visual	0.04 (0.19)	0.01 (0.06)	32
		verbal	0.04 (0.14)	0.06 (0.16)	32
(b, a)	a	visual	0.17 (0.37)	0.16 (0.29)	32
		verbal	0.03 (0.18)	0.07 (0.18)	32
	b	visual	0.03 (0.18)	0.05 (0.19)	32
		verbal	0.00 (0.00)	0.04 (0.11)	32

It was hypothesized that object pairs with a brand name for object *a* would result in metaphorical interpretations in the form [A = B]. In the first part of the questionnaire, a main effect of brand name on the interpretation form [A = B] was found, F (1, 62) = 6.48, p = .013, η^2 = 0.10. Contrasts revealed that object pairs with a brand name for object *a* resulted in a metaphorical interpretation in the form [A = B] (M = 0.11, SE = 0.03) more often than object pairs with a brand name for object *b* (M = 0.03, SE = 0.01). Also in the second part of the questionnaire, a main effect of brand name on the interpretation form [A = B] was found, F (1, 62) = 8.41, p = .005, η^2 = 0.12. Contrasts revealed that object pairs with a brand name for object *a* resulted in a metaphorical interpretation in the form [A = B] (M = 0.13, SE = 0.03) more often than object pairs with a brand name for object *b* (M = 0.04, SE = 0.01). The main effects of brand name on interpretation form [A = B] in part I and part II of the questionnaire are shown in Figure 42.

In the first part of the questionnaire, an interaction effect between order and modality was found, F (1, 62) = 4.40, p = .040, η^2 = 0.07. Contrasts revealed that order (a, b) (M = 0.09, SE = 0.03) resulted in more interpretations in the form [A = B] than order (b, a) (M = 0.02, SE = 0.03) in the verbal modality, but that order (a, b) (M = 0.08, SE = 0.03) resulted in less interpretations in the form [A = B] than order (b, a) (M = 0.10, SE = 0.03) in the visual

modality. The interaction effect between order and modality on interpretation form [A = B] in part I of the questionnaire is shown in Figure 43.

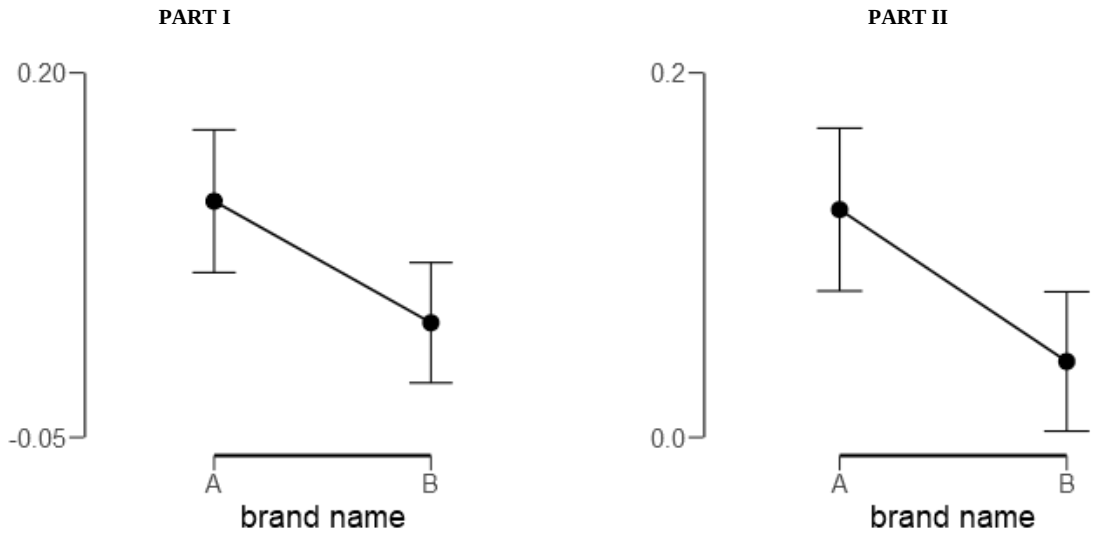


Figure 42. Experiment 3: mean scores metaphorical interpretation [A=B] in part I (left) and part II (right), as a function of brand name.

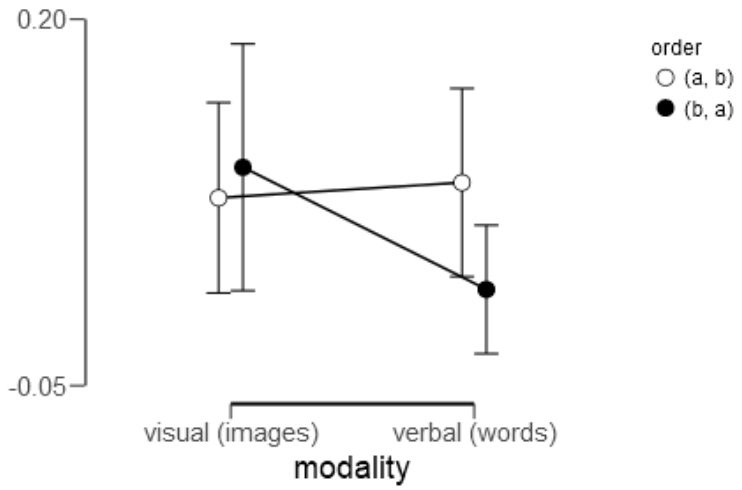


Figure 43. Experiment 3: mean scores metaphorical interpretation [A=B] part I, as a function of the interaction between order and modality.

No other effects were found. As for order, in the first part of the questionnaire no effect of order was found, F (1, 62) = 1.36, p = .248, η^2 = 0.02. Object pairs in the order (a, b) (M = 0.08, SE = 0.02) resulted in similar scores for interpretations in the form [A = B] as object pairs in the order (b, a) (M = 0.06, SE = 0.02). Also in the second part of questionnaire no effect of order was found, F (1, 62) = 0.07, p = .794, η^2 = 0.00. Object pairs in the order (a, b)

(M = 0.09, SE = 0.02) resulted in similar scores for interpretations in the form [A = B] as object pairs in the order (b, a) (M = 0.08, SE = 0.02).

Also, no effect of modality was found in the first part of the questionnaire, F (1, 62) = 1.10, p = .299, η^2 = 0.02. Visually presented object pairs (M = 0.09, SE = 0.03) resulted in similar scores for interpretations in the form [A = B] as verbally presented object pairs (M = 0.05, SE = 0.03). In the second part of the questionnaire also no effect of modality was found, F (1, 62) = 0.42, p = .521, η^2 = 0.01. Visually presented object pairs (M = 0.09, SE = 0.02) resulted in similar scores for interpretations in the form [A = B] as verbally presented object pairs (M = 0.07, SE = 0.02).

Brand names in symmetrical object pairs, metaphorical interpretation form [B = A]

To measure the effect of brand name on the form of the metaphorical interpretation of symmetrical object pairs, participants' answers were coded as a metaphorical interpretation in the form [A = B] or [B = A]. Descriptive statistics for the mean scores for a metaphorical interpretation in the form [B = A] for all within-subjects variables, as a function of modality and form of interpretation are given in Table 15.

Table 15

Experiment 3 symmetrical pairs: mean scores for metaphorical interpretation in the form [B = A] in part I and part II of the questionnaire (SD in parentheses) (0: interpretation type was present in none of participants' answers – 1: interpretation type was present in all participants' answers).

Order	Brand name	Modality	Mean score (*SD*) Part I	Mean score (*SD*) Part II	*N*
(a, b)	a	visual	0.05 (0.19)	0.16 (0.31)	32
		verbal	0.00 (0.00)	0.17 (0.34)	32
	b	visual	0.14 (0.30)	0.37 (0.44)	32
		verbal	0.10 (0.27)	0.25 (0.36)	32
(b, a)	a	visual	0.04 (0.19)	0.25 (0.40)	32
		verbal	0.07 (0.25)	0.23 (0.36)	32
	b	visual	0.26 (0.41)	0.16 (0.31)	32
		verbal	0.13 (0.30)	0.25 (0.39)	32

It was hypothesized that object pairs with a brand name for object *b* would result in metaphorical interpretations in the form [B = A]. In the first part of the questionnaire, a main effect of brand name on the interpretation form [B = A] was found, F (1, 62) = 14.14, p < .001, η^2 = 0.18. Contrasts revealed that object pairs with a brand name for object *b* resulted in a metaphorical interpretation in the form [B = A] (M = 0.16, SE = 0.03) more often than object pairs with a brand name for object *a* (M = 0.04, SE = 0.02). In the second part of the questionnaire, no main effect of brand name on the interpretation form [B = A] was found, F (1, 62) = 1.34, p = .252, η^2 = 0.02. Object pairs with a brand name for object *a* resulted in similar scores for a metaphorical interpretation in the form [B = A] (M = 0.20, SE = 0.03) as object pairs with a brand name for object *b* (M = 0.26, SE = 0.03). The main effect of brand name on interpretation form [B = A] in part I of the questionnaire is shown in Figure 44.

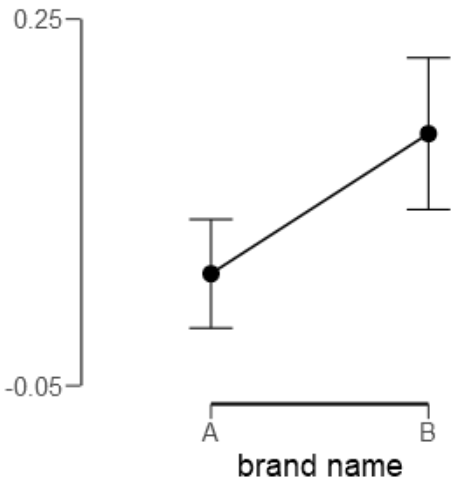


Figure 44. Experiment 3: mean scores metaphorical interpretation [B=A] in part I, as a function of brand name.

No other effects were found. As for order, in the first part of the questionnaire no effect was found, F (1, 62) = 3.35, p = .072, η^2 = 0.05. Object pairs in the order (a, b) (M = 0.07, SE = 0.02) resulted in similar scores for interpretations in the form [B = A] as object pairs in the order (b, a) (M = 0.13, SE = 0.03). Also in the second part of questionnaire no effect of order was found, F (1, 62) = 0.13, p = .717, η^2 = 0.00. Object pairs in the order (a, b) (M = 0.23, SE = 0.03) resulted in similar scores for interpretations in the form [B = A] as object pairs in the order (b, a) (M = 0.22, SE = 0.03).

Also, no effect of modality was found in the first part of the questionnaire, F (1, 62) = 1.52, p = .222, η^2 = 0.02. Visually presented object pairs (M = 0.12, SE = 0.03) resulted in similar scores for interpretations in the form [B = A] as verbally presented object pairs (M = 0.08, SE = 0.03). In the second part of the questionnaire also no effect of modality was found,

F (1, 62) = 0.03, p = .862, η^2 = 0.00. Visually presented object pairs (M = 0.23, SE = 0.03) resulted in similar scores for interpretations in the form [B = A] as verbally presented object pairs (M = 0.22, SE = 0.03).

Discussion

In Experiment 3 participants were asked to find connections between objects in 16 different object pairs. Eight object pairs could be defined as asymmetrical, as based on the results of Experiment 1 of the present study. The other eight object pairs could be defined as symmetrical, also as based on the results of the first experiment. Different from Experiment 2, brand names were added to the object pairs in Experiment 3 to create an advertising context.

It was expected that asymmetrical object pairs would elicit metaphorical interpretations ([A = B] and [B = A]) more often than symmetrical object pairs, and that symmetrical object pairs would elicit interpretations of comparison ([A is like B] and [B is like A]) more often than asymmetrical object pairs. Regarding order, it was expected that order would not affect type of interpretation. The presence of the brand names would interfere with the possible effect of order on the interpretation of symmetrical object pairs. Furthermore, it was hypothesized that symmetrical object pairs would result in similar response times as asymmetrical object pairs, because the presence of the brand names would make it easier to find connections in all object pairs. To compare verbal and visual object pairs, half of the participants saw the object pairs in images, the other half saw the object pairs in words.

Similar to Experiment 2, the questionnaire of Experiment 3 consisted of two parts. In the first part, participants were asked to write down their own thoughts about the connections between the objects. By means of such an open answer question it can be revealed which features are salient for the participants, and which display schemas and domain knowledge they use (Hegarty, 2011). In the second part, participants were asked to choose one of four given interpretations for the connections between the object pairs. Analyses were done separately for both parts.

The results showed that in the first part of the questionnaire, symmetrical object pairs were more often interpreted as comparison than asymmetrical object pairs. Asymmetrical object pairs were more often interpreted metaphorically than symmetrical object pairs, although most participants still made an interpretation of comparison for asymmetrical object

pairs. These results confirm the first two hypotheses. Similar to the findings in Experiment 2, no connection was found more often for asymmetrical pairs than for symmetrical pairs.

Confirming the third hypothesis, no effects of order were found. Even if symmetrical object pairs were interpreted metaphorically, the presence of the brand names and product categories would have prevented that order of object could have an influence on which of the objects would be interpreted as topic. Confirming the fourth hypothesis, no effects of symmetry on response times were found. Presumably, the presence of the brand names and product categories made it easier to find a connection between the objects for both symmetrical and asymmetrical object pairs.

Differences between symmetrical and asymmetrical object pairs were stronger in the verbal modality than in the visual modality. An explanation could be that the brand names, which were given in written form, were less directly similar to the objects in the visual modality (because these objects were black and white drawings) than to the objects in the verbal modality (because these objects were also written words). This could have resulted in larger differences between verbally presented object pairs, as compared to visually presented object pairs.

The fifth hypothesis was confirmed by the results; object pairs within an advertising context elicited more metaphorical interpretations than object pairs without an advertising context. Also, the differences between symmetrical pairs and asymmetrical pairs were larger when context was given.

All asymmetrical object pairs in Experiment 3 were accompanied by a brand name for the consumer product, since it is odd to advertise for atomic bombs and antelopes. The symmetrical object pairs were accompanied by either a brand name for object *a*, or a brand name for object *b*. The total scores are given in Table 25 and Table 26 in Appendix III. The results for the first part of the questionnaire did confirm the sixth hypothesis; the form of the metaphorical interpretation was affected by the brand name. Symmetrical object pairs with a brand name for object *a* were more likely to elicit a metaphorical interpretation in the form [A = B]. Symmetrical pairs with a brand name for object *b* on the other hand, were more likely to elicit a metaphorical interpretation in the form [B = A]. In the second part of the questionnaire however, an overall preference for the metaphorical interpretation in the form [B = A] was visible, also when the brand name referred to object *a*. So, in the second part of the questionnaire, brand name did not always affect interpretation type. An explanation could be that two of the symmetrical pairs elicited relatively many metaphorical interpretations. In the symmetrical pairs *bed- sleeping bag* and *perfume- detergent*, some participants interpreted

sleeping bag and *detergent* (both consumer good objects *b*) as topic, even when the brand name and the product category referred to *bed* and *perfume*. As for the pair *bed- sleeping bag*, an explanation could be that the product category for the object *bed* was *beds*. A sleeping bag is a bed as well. Knowing that the object pair was part of an advertisement for beds, participants preferred an interpretation of *sleeping bag* as topic of the ad, as having the comfort of a normal bed. As for the pair *perfume- detergent*, participants might have been more satisfied with the interpretation *'Detergent is like perfume'* instead of *'Perfume is like detergent'*, even if the brand name and product category referred to *perfume* as the topic of the advertisement.

To conclude, Experiment 3 again confirmed the differences between symmetrical and asymmetrical pairs, regarding the elicitation of interpretations of comparison and metaphorical interpretations. Although many asymmetrical pairs were still interpreted as comparison, the addition of a meaningful context increased the number of metaphorical interpretations. The addition of a brand name and a product category seems to invite people to cross-domain mapping and metaphorical interpretations. Once metaphorical interpretations were made, the brand name could affect the form of the interpretation. Especially for symmetrical object pairs, in which both objects are suitable topics for an advertisement, the brand name could have an influence on which of the objects is interpreted as topic.

General discussion

In Figure 45 we see two entities,a dress and a butterfly, which do not seem to be related to each other at first sight. One could wonder why these objects are placed next to other. How are these two object connected? Maybe one of the objects tells something about the other object? For instance, *'the dress is as elegant and beautiful as a butterfly'*.

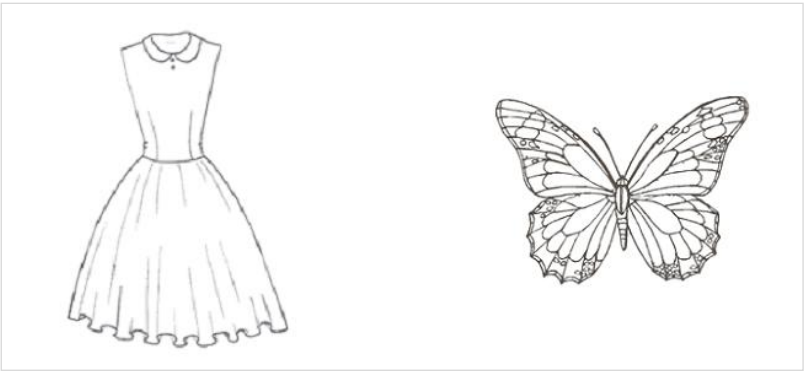


Figure 45. Dress and butterfly.

Juxtaposed entites like the dress and the butterfly in Figure 45 might elicit such metaphorical interpretations. However, this is not guaranteed. Some people might come up with interpretations of comparison, like *'Both the butterfly and the dress have colours, are girly, are elegant, are beautiful, and are fluttering*'. Therefore, the juxtapositon in Figure 45 is not a metaphor. The metaphor of a dress being as beautiful as a butterfly is part of the perceiver's internal representation. Internal respresentations are products of processes like cross-domain mapping and comparison. There might be some factors that could affect the type of process perceivers will go through when they are trying to make sense of the message. In domains like advertising it is important for the success of an advertisement that perceivers interpret the message in a certain way. Knowledge of cues that could lead to a process of cross-domain mapping, resulting in metaphorical interpretations, will contribute to the rich research domain of juxtaposed entities in advertisements. The cues that were investigated in the present study were (a)symmetry, order and context. Modality, presenting the objects visually or verbally, was added as an extra factor. The research question of the present study was: *To what extent do (a)symmetry, order and context affect the interpretation of verbally and visually presented juxtaposed entities?*

Experiment 1 confirmed that a difference between symmetrical and asymmetrical object pairs can be made. A pair of objects *a* and *b* is symmetrical if both objects can be interpreted as topic (e.g., *'banana is (like) bread'* and *'bread is (like) banana'*), what makes it more likely to elicit interpretations of comparison. A pair of objects *a* and *b* is asymmetrical if one of the objects is more likely to be interpreted as topic than the other, what makes it more likely to be interpreted metaphorically. In Experiment 2 and Experiment 3 the effects of symmetry on interpretation type (comparison or cross-domain mapping) were found as well, although asymmetrical pairs were still often interpreted as comparison or not interpreted at all, even within an advertising context. Symmetrical object pairs were most likely to elicit interpretations of comparison (*'An X is like a Y'*), while asymmetrical object pairs could elicit metaphorical interpretations (*'An X is a Y'*), supporting the 'grammatical concordance' as described by Bowdle & Gentner (2005). Even within an advertising context in which brand names and product categories give away the topic of the message, a difference between the way people interpret symmetrical and asymmetrical pairs was found, and these differences were even larger than when no context was given. Nevertheless, most participants interpreted asymmetrical object pairs as comparisons and did not interpret one of the objects as topic of the message. Since ads are designed to communicate a certain product (functioning as topic of the message), this finding might sound problematic for the advertising market. Our findings

therefore raise questions for ad designers and future research which additional cues are necessary to invite people even more to engage in cross-domain mapping, resulting in the intended metaphorical interpretations.

Based on findings of Chiappe et al. (2003) and Kress and Van Leeuwen (2006), we hypothesized that order might affect which object was interpreted as topic in symmetrical object pairs. People tend to interpret the left entity as the topic of the message (the 'given') and the right element as the entity that gives information that can be related to the topic (the 'new') (Chiappe et al., 2003; Kress & Van Leeuwen, 2006). We expected participants to interpret the first or left entity of an object pair as topic, especially when both objects were likely candidates, as was the case in symmetrical pairs. However, order did not seem to affect the type of interpretation of the object pair. This finding is in line with previous findings by Indurkhya and Ojha (2017), who argued that order did not play a role in the interpretation of target and source in metaphors. Unlike us, Indurkhya and Ojha (2017) did not include symmetrical object pairs in their study. However, based on our findings we have to conclude that order also does not play a role in the interpretation of symmetrical object pairs. A possible explanation could be that most symmetrical object pairs were interpreted as comparison. A process of cross-domain mapping seems necessary for order to play a role. Without cross-domain mapping and metaphorical interpretations, none of the objects is preferred over the other as topic. Therefore, order could not affect which of the objects was interpreted as topic. For Experiment 3 it was expected, and also confirmed by the results, that order would not play a role. If symmetrical object pairs were interpreted metaphorically, the presence of the brand names and product categories prevented that the order of the object influenced which of the objects was interpreted as topic.

Many studies have shown the beneficial effects of context and verbal cues on the interpretation of different forms of visual communication and metaphors in advertising (Cohn, 2010; Refaie, 2003; Van Enschot & Hoeken, 2015). Therefore, an advertising context was added to the juxtaposed entities in Experiment 3 of the present study, by means of fictitious brand names and corresponding product categories. The results of comparing participants' answers in Experiment 2 and participants' answers in Experiment 3 showed that object pairs within an advertising context elicited more metaphorical interpretations than object pairs without an advertising context. Adding a brand name and a product category provides participants with information about the topic of the message. Giving away the topic seems to have a beneficial effect on getting into the process of cross-domain mapping.

Especially for juxtapositions in which both objects are suitable topics for an advertisement, i.e., symmetrical pairs, the present study showed advantageous effects of the addition of a brand name. Symmetrical object pairs with a brand name for object *a* resulted in a metaphorical interpretation in the form [A = B] more often than symmetrical pairs with a brand name for object *b*. Symmetrical pairs with a brand name for object *b* resulted in a metaphorical interpretation in the form [B = A] more often than symmetrical pairs with a brand name for object *a*. For instance, in an advertisement for bananas the ad designer wants to communicate that bananas are as nutritious as bread. Adding a clear contextual cue not only increases the chance of elicitation of a metaphorical interpretation, but also makes it more likely that the metaphorical interpretation is made in the intended form *'Bananas are as nutritious as bread'*. However, these results were only found in the first part of the questionnaire. In the second part of the questionnaire no advantageous effect of brand name was found, maybe because participants just clicked on one of the four options without always considering the brand name in the right bottom corner. The faster response times in the second part of the questionnaire could support this explanation.

The object pairs in the present study were presented either verbally or visually. In Experiment 1 and Experiment 3, some differences between symmetrical and asymmetrical pairs, and between order (a, b) and order (b, a), were larger in the verbal modality than in the visual modality. An explanation could be that object pairs in the visual modality already look somewhat similar to real advertisements that often contain images as well. It might be harder to choose which of the objects is best to advertise for when both objects are presented visually as if they are already part of an advertisement, resulting in smaller differences. In the verbal modality, no explicit perceptual features are given. In Experiment 1, participants in the verbal modality had to make a decision based on their own representations of the objects, which might have resulted in larger differences between expected asymmetrical and expected symmetrical object pairs regarding the choice of topic. As for Experiment 3; the fact that the brand names and product categories were written in words, similar to the object in the verbal condition, could probably explain that differences were larger in the verbal modality. In future research it would be interesting to include visual contextual cues as well, for instance smaller versions of one of the drawn objects.

Although we have tried to keep features like shape, orientation and size as similar as possible for all objects in the visual modality, the results of Experiment 2 showed that visually presented object pairs resulted in longer response times than verbally presented object pairs.

In the verbal modality, participants only had their own representations of the objects in their minds, which made it easier to come up with connections. In the visual modality, there is a lot more (visual) information to process. Explicit perceptual features like shape and size might have distracted the participant in finding connections, resulting in longer response times.

In the present study it was found that the interpretation of juxtaposed entities could be affected by symmetry and context, but not by order and modality. As for order, it might have been possible that the left-right difference was not optimally operationalized in the present study. Object pairs were presented on participants' personal computer screens, which made it impossible to ensure that people perceived each object pair in the intended left-right order. In future research it would be interesting to actually show the objects one by one, for instance appearing on the left versus right side or up versus bottom side of a screen. This might be a better way to establish an actual difference in order of objects when presented in a verbal or visual expression. Also, in our western culture we read from left to right. In verbal expressions, the left topic of the communication is often fixed as topic. It would be interesting to study the effects of order in interpreting juxtaposed entities in Arabic cultures where people read from right to left. As for modality, for future research it would still be sensible to include both the verbal and visual modality. In the present study no main effects of modality on the interpretation of the object pairs were found, but modality was involved in some interaction effects.

A short note regarding the two questionnaire parts in Experiment 2 and Experiment 3. Although no statistical tests were conducted to compare the effects of part 1 (open answer question) and part 2 (multiple choice question) of the questionnaire on the interpretation of the object pairs, the mean scores in Table 6 and Table 10 seem to indicate that the multiple choice question resulted in more metaphorical interpretations for all object pairs, as compared to the open answer question. Measurements of participants' own answers and response times by means of open answer questions and multiple choice questions are appropriate ways of studying how people interpret and comprehend juxtaposed entities. However, future research could consider using other measurements, like eye movements, as well.

A possible limitation of the present study is the absence of real advertisements in the stimuli set. The stimuli that were used in the present study were black and white drawing of objects and animals in the images condition, and simple nouns in the words condition. These stimuli were more than sufficient to study the effects of (a)symmetry, order and context on the interpretation of visually and verbally presented juxtaposed entities. Albeit these drawings and simple words were certainly suited to study the effects of an advertising context by

providing participants with a brand name and product type, it should be nice to further investigate the role of context by using real images or even real advertisements to elicit metaphorical interpretations. The use of real(-looking) advertisement would better benefit the ecological validity, since real life advertisements rarely contain simple black and white drawings or words. Further research could approach the role of (a)symmetry, order and context on the interpretations of entities in real(-looking) advertisements, including professionally designed images with attracting colours and fonts. Such stimuli could look like the object pairs *bike- antelope* and *speedboat- swordfish* in Figure 46 and Figure 47 respectively.

Figure 46. Antelope and bike.

Figure 47. Speedboat and swordfish.

The visual structure of all object pairs in present study was juxtaposition, where two objects or entities where placed next to each other. To investigate the role of order in the interpretation of object pairs, juxtaposition was the best visual structure to start with. It might be an interesting next step to further investigate the effects of (a)symmetry and context on the interpretation of fused objects, like the fusions in Figure 48, 49, and 50. In these examples, three object pairs from the present study, i.e., *hot sauce- hand grenade, bread- orange,* and *beer- ice cream*, are depicted in the visual structure of a fusion, in which two images have been fused into one single image (Philips & McQuarrie, 2004).

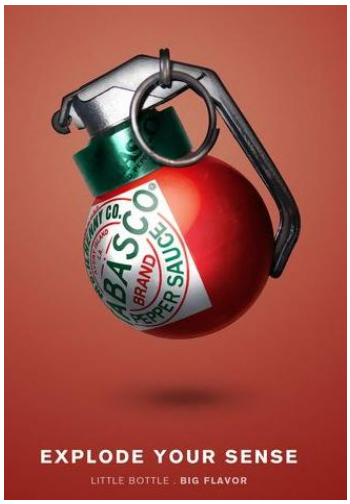


Figure 48. Hot Sauce (is Hand grenade) Tabasco

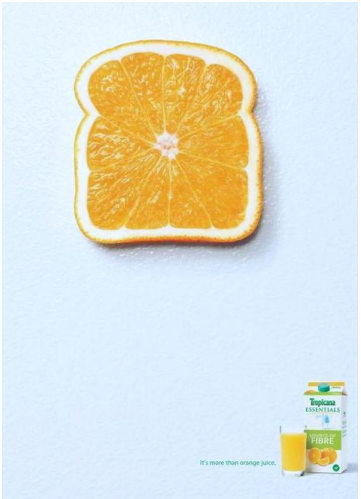


Figure 49. Orange Juice (is Bread) Tropicana

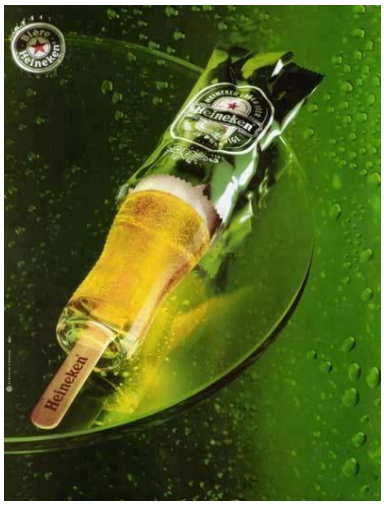


Figure 50. Beer (is Ice cream) Heineken

As for studying the interpretation of juxtaposed entities, other domains than advertising would be interesting to consider as well. In the present study an advertising context was chosen as starting point, resulting in object pairs with one or two consumer goods. In domains of visual art, poetry, political cartoons or ordinary communication, object pairs would consist of other entities and might even result in different types of symmetry.

Conclusion

To be concluded, the present research study has shown that (a)symmetry and context could affect the interpretation of verbally and visually presented juxtaposed entities. If both objects are likely to appear in an advertisement, i.e., symmetrical object pairs, it is likely that people will come up with interpretations of comparison (e.g., *'A banana and a bread are both food*'). If one of the objects is more likely to appear in an advertisement than the other object, i.e., asymmetrical object pairs, the chance increases that people will go through a process of cross-domain mapping, resulting in metaphorical interpretations (e.g., *'A dress is a butterfly'*). Adding a contextual cue to the object pair increases the chance of cross-domain mapping even more, as compared to object pairs for which no context was given. Especially for symmetrical object pairs, the addition of a brand name and a product category was shown to be beneficial for ending up with a metaphorical interpretation of the object pair in the intended form. So, it does matter for the type of interpretation whether the message is about butterflies or bananas, but the addition of a clear context could definitely steer people in the direction of cross-domain mapping and internal metaphorical representations.

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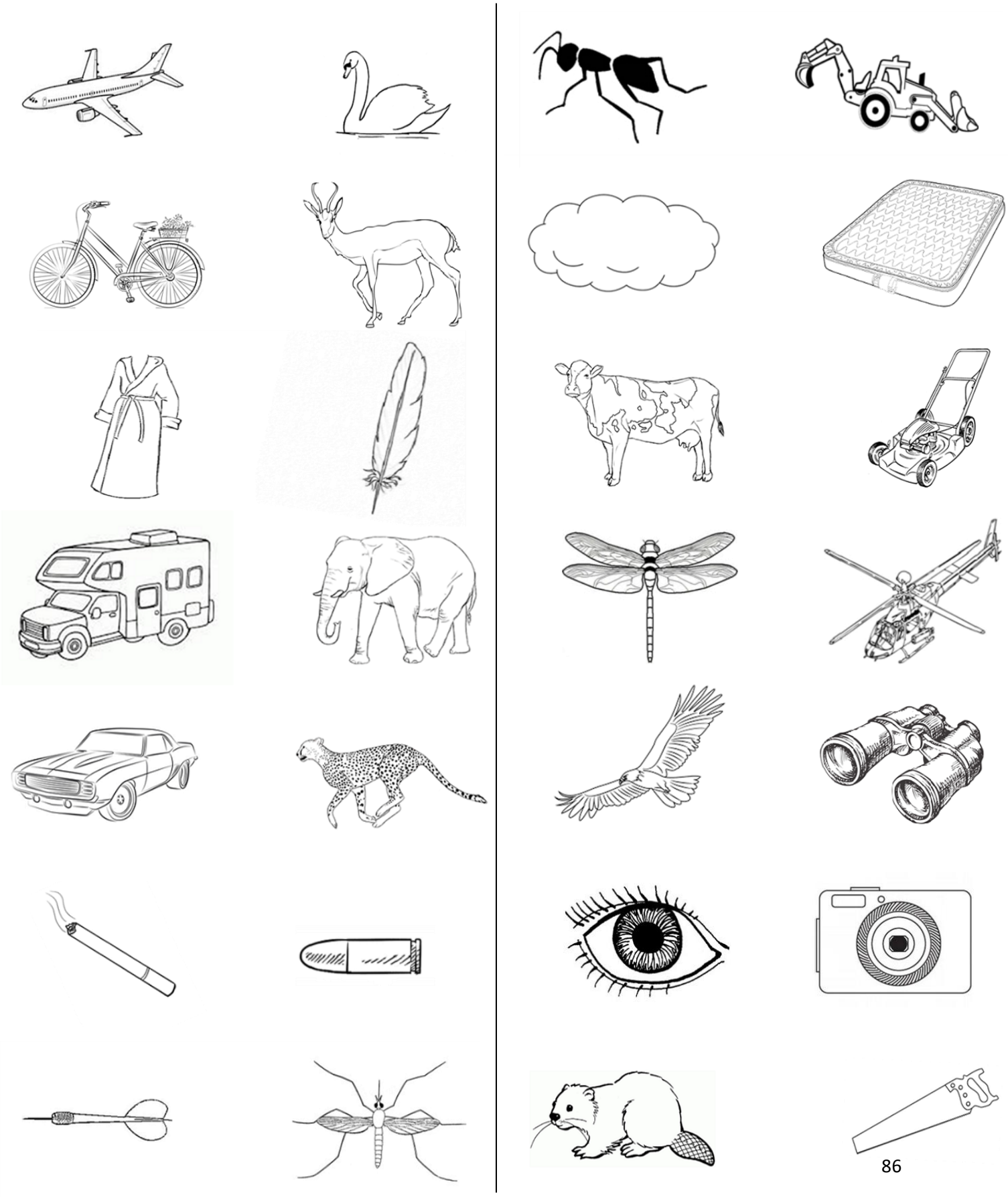
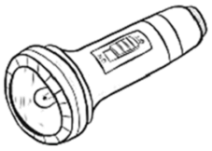
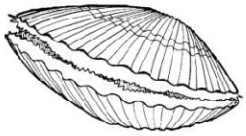
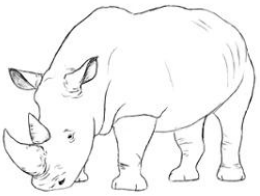
APPENDIX I: MATERIALS EXPERIMENT 1

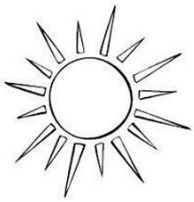
Expected asymmetrical object pairs

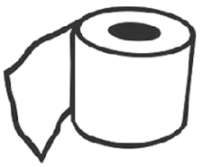


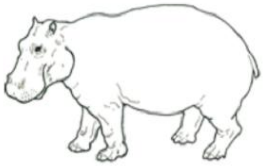


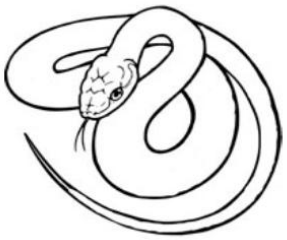


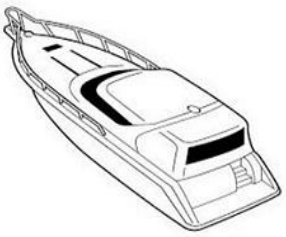


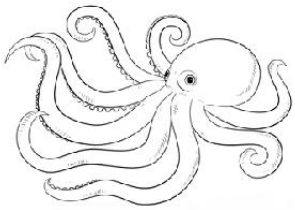
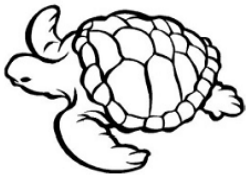


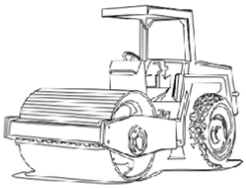




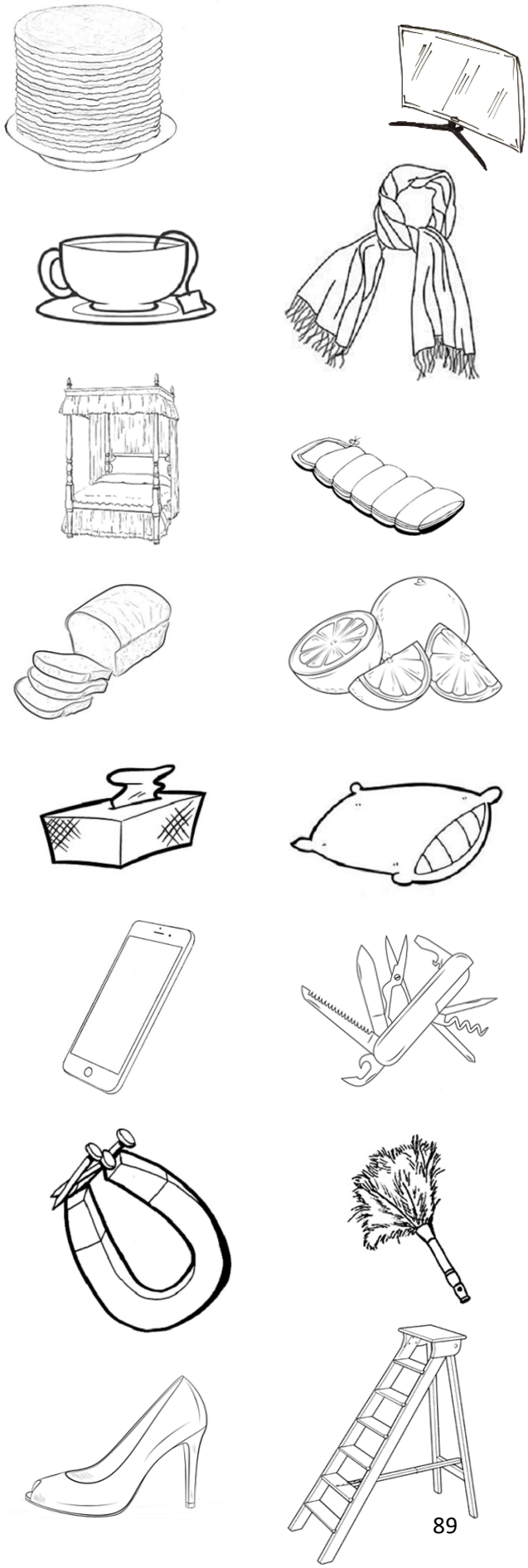




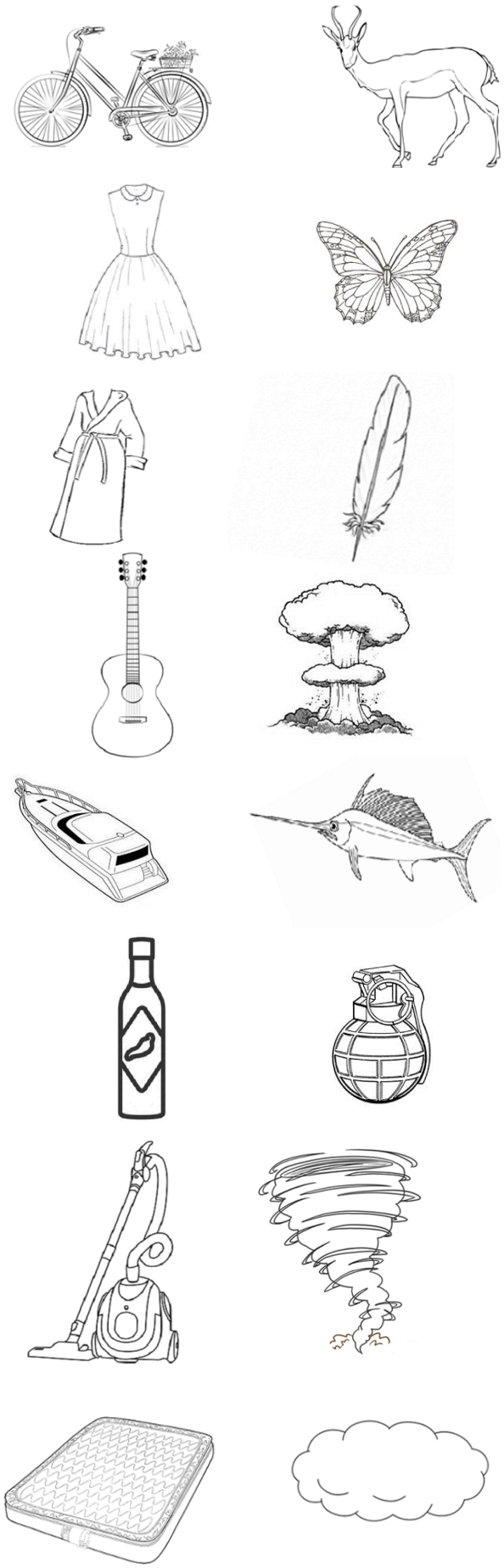


Expected symmetrical object pairs



APPENDIX II: MATERIALS EXPERIMENTS 2 and 3

Asymmetrical object pairs, in order (a, b)



Symmetrical object pairs, in order (a, b)

APPENDIX III: Frequencies tables raw data

Table 16

Experiment 1: total scores for choice of topic.

Experiment 1	Object left	Object right	Both objects	Total
Symmetrical (a, b)	174	116	262	552
Symmetrical (b, a)	132	180	240	552
Asymmetrical (a, b)	1089	113	144	1346
Asymmetrical (b, a)	89	1113	143	1345

Table 17

Experiment 2.1: total scores for interpretation type without a given context.

Experiment 2.1	Metaphorical	No connection	Comparison	Total
Symmetrical (a, b)	9	4	279	292
Symmetrical (b, a)	4	7	289	300
Asymmetrical (a, b)	25	43	228	296
Asymmetrical (b, a)	22	48	226	296

Table 18

Experiment 2.1: total scores for form of interpretation type without a given context.

Experiment 2.1	a = b	b = a	No connection	Comparison	Total
Symmetrical (a, b)	6	3	4	279	292
Symmetrical (b, a)	1	3	7	289	300
Asymmetrical (a, b)	24	1	43	228	296
Asymmetrical (b, a)	16	6	48	226	296

Table 19

Experiment 2.2: total scores for interpretation type without a given context.

Experiment 2.2	Metaphorical	No connection	Comparison	Total
Symmetrical (a, b)	76	42	174	292
Symmetrical (b, a)	70	42	188	300
Asymmetrical (a, b)	90	94	112	296
Asymmetrical (b, a)	77	118	101	296

Table 20

Experiment 2.2: total scores for form of interpretation type without a given context.

Experiment 2.2	a = b	b = a	No connection	Comparison	Total
Symmetrical (a, b)	19	57	42	174	292
Symmetrical (b, a)	23	47	42	188	300
Asymmetrical (a, b)	62	28	94	112	296
Asymmetrical (b, a)	56	21	118	101	296

Table 21

Experiment 3.1: total scores for interpretation type within a given context.

Experiment 3.1	Metaphorical	No connection	Comparison	Total
Symmetrical (a, b)	46	12	202	260
Symmetrical (b, a)	34	12	206	252
Asymmetrical (a, b)	84	31	141	256
Asymmetrical (b, a)	82	29	145	256

Table 22

Experiment 3.1: total scores for form of interpretation type within a given context.

Experiment 3.1	a = b	b = a	No connection	Comparison	Total
Symmetrical (a, b)	24	22	12	202	260
Symmetrical (b, a)	10	24	12	206	252
Asymmetrical (a, b)	79	5	31	141	256
Asymmetrical (b, a)	76	6	29	145	256

Table 23

Experiment 3.2: total scores for interpretation type within a given context.

Experiment 3.2	Metaphorical	No connection	Comparison	Total
Symmetrical (a, b)	77	47	136	260
Symmetrical (b, a)	72	40	140	252
Asymmetrical (a, b)	115	63	78	256
Asymmetrical (b, a)	105	73	78	256

Table 24

Experiment 3.2: total scores for form of interpretation type within a given context.

Experiment 3.2	a = b	b = a	No connection	Comparison	Total
Symmetrical (a, b)	25	52	47	136	260
Symmetrical (b, a)	25	47	40	140	252
Asymmetrical (a, b)	100	15	63	78	256
Asymmetrical (b, a)	92	13	73	78	256

Table 25

Experiment 3.1: total scores for interpretation type for symmetrical pairs with brand name for object a or object b.

Experiment 3.1	a = b	b = a	No connection	Comparison	Total
Symmetrical (a, b) brand name *a*	18	3	7	102	130
Symmetrical (a, b) brand name *b*	6	19	5	100	130
Symmetrical (b, a) brand name *a*	9	5	1	111	126
Symmetrical (b, a) brand name *b*	1	19	11	95	126

Table 26

Experiment 3.2: total scores for interpretation type for symmetrical pairs with brand name for object a or object b.

Experiment 3.2	a = b	b = a	No connection	Comparison	Total
Symmetrical (a, b) brand name *a*	18	17	25	70	130
Symmetrical (a, b) brand name *b*	7	35	22	66	130
Symmetrical (b, a) brand name *a*	18	24	16	68	126
Symmetrical (b, a) brand name *b*	7	23	24	72	126

APPENDIX IV: Coding examples Experiment 2

Metaphorical interpretation, [A = B]

"Op een matras liggen voelt net alsof je op een wolkje ligt" (*matras- wolk*)

[English: "Lying on a mattress feels like lying on a cloud" (*mattress- cloud*)]

"Een stofzuiger heeft net als een tornado een enorme zuigkracht" (*stofzuiger- tornado*)

[English: "A vacuum cleaner has enormous suction power like a tornado" (*vacuum cleaner- tornado*)]

"De jurk is net zo elegant als een vlinder" (*jurk- vlinder*)

[English: "The dress is as elegant as a butterfly" (*dress- butterfly*)]

"IJs is net zo koud als bier" (*ijs- bier*)

[English: "Ice cream is as cold as beer" (*ice cream- beer*)]

Metaphorical interpretation, [B = A]

"De snoekvis is net zo snel in het water als een speedboot" (*speedboot- zwaardvis*)

[English: "The pike is as fast in the water as a speed boat" (*speedboat- sword fish*)]

"Een veer is net zo zacht als een badjas" (*badjas- veer*)

[English: "A feather is as soft as a bathrobe" (*bathrobe- feather*)]

"Je kan net zo lekker slapen in een slaapzak als in een bed" (*bed- slaapzak*)

[English: "You can sleep as nice in a sleeping bag as in a bed" (*bed- sleeping bag*)]

"Een tornado zuigt net als een stofzuiger alles op waar die langs komt" (*tornado- stofzuiger*)

[English: "A tornado sucks anything it passes like a vacuum cleaner" (*tornado- vacuum cleaner*)]

No connection found

"Ik zie geen connectie"

[English: "I do not see a connection"]

Comparison statement [Both A and B have these features]

"Brood en sinaasappelen kun je allebei eten" (*brood- sinaasappel*)

[English: "You can eat both bread and oranges" (*bread- oranges*)]

"Een gitaar en een atoombom maken beide lawaai" (*gitaar- atoombom*)
[English: "A guitar and an atomic bomb both make noise" (*guitar- atomic bomb*)]

"Thee en sjaal zijn allebei tegen de kou" (*thee- sjaal*)
[English: "A tea and a scarf both are against cold" (*tea- scarf*)]

"Chilisaus en een handgranaat zijn beiden explosief" (*chilisaus- handgranaat*)
[English: "Hot sauce and a hand grenade both are explosive" (*hot sauce- hand grenade*)]

Other connection, but odd or far-fetched [A ~ B]

"Zowel banaan als brood beginnen met de letter B" (*brood- banaan*)
[English: "Both banana and bread begin with the letter B" (*bread- banana*)]

"Een klamboe voor een bed wat muggen in de avond kan tegenhouden" (*slaapzak- bed*)
[English: "A mosquito net for a bed that can stop mosquitoes in the evening" (*sleeping bag- bed*)]

"Broche" (*vlinder- jurk*)
[English: "Brooch" (*butterfly- dress*)]

"Fiets en antilope hebben als connectie dat je met fietsen niet loopt, dus een woordspeling." (*fiets- antilope*)
[English: "The connection between bike and antelope is that you do not walk with bikes, so it is a pun" (*bike- antelope*)]

APPENDIX V: Coding examples Experiment 3

Metaphorical interpretation, [A = B]

"Deze fiets is zo snel en elegant als een gazelle" (*fiets- antilope (BICLASSICS fietsen)*)

[English: "This bike is as fast and as elegant as a gazelle" (*bike- antelope (BICLASSICS bikes)*)]

"De chilisaus is zo scherp dat je mond voelt alsof er zojuist een granaat in is ontploft" (*chilisaus- handgranaat (SALSA FIESTA chilisauzen)*)

[English: "The hot sauce is very sharp, it feels like a grenade just exploded in it" (*hot sauce- hand grenade (SALSA FIESTA hot sauces)*)]

"Belladonna jurken zijn zo mooi als een vlinder" (*vlinder- jurk (BELLADONNA jurken*)

[English: "Belladonna dresses are as beautiful as a butterfly" (*butterfly- dress (BELLADONNA*))]

Metaphorical interpretation, [B = A]

"Het hert is net zo snel als een fiets" (*antilope- fiets (BICLASSICS fietsen)*)

[English: "The deer is as fast as a bike" (*antelope- bike (BICLASSICS bikes)*)]

"Deze sjaal houdt je zo warm als een kop thee" (*thee- sjaal (FREYA FASHION sjaals))*

[English: "This scarf keeps you as warm as a cup of tea" (*tea- scarf (FREYA FASHION scarves)*)]

"Yukka slaapzakken slapen zo goed als je eigen bed" (*slaapzak- bed (YUKKA slaapzakken)*)

[English: "Yukka sleeping bags are as good for sleeping as your own bed" (*sleeping bag- bed (YUKKA sleeping bags)*)]

No connection found

"Ik zie geen connectie"

[English: "I do not see a connection"]

Comparison statement [Both A and B have these features]

"Tissues en kussens zijn allebei zacht." (*zakdoek- kussen (VANIDEX zakdoekjes)*)

[English: "Tissues and pillows are both soft" (*tissue- pillow (VANIDEX tissues)*)]

"Bier en ijsje zijn allebei ongezond" (*bier- ijsje (HOPSE HAECK bier)*)

[English: "Beer and ice cream are both unhealthy" (*beer- ice cream (HOPSE HAECK beer)*)]

“Zowel een handgranaat en chilisaus zorgen beide voor een explosie” (*handgranaat- chilisaus (SALSA FIESTA chilisauzen*)

[English: “Both a hand grenade and hot sauce cause explosion” (*hand grenade- hot sauce (SALSA FIESTA hot sauces)*)]

Other connection, but odd or far-fetched [A ~ B]

“Met chilisaus lok je Mexicanen en met de handgranaat(vul de rest maar in)” (*chilisaus-handgranaat (SALSA FIESTA chilisauzen*)

[English: “With hot sauce you attract Mexicans and with the hand grenade (you can imagine what happens then)” (*hot sauce- hand grenade (SALSA FIESTA hot sauces*))]

“De theeplukkers hebben meestal een sjaal om” (*thee- sjaal (WOODS thee)*)

[English: “Tea picks often wear a scarf” (*tea- scarf (WOODS tea)*)]