A is (not) like B
The influence of meaning operation in ads with visual metaphors on the comprehension and consumer reaction across high-context and low-context cultures.

Master Thesis

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Abstract

The use of visual metaphors in advertisements has become increasingly popular for international brands. However, previous studies have shown that the consumer reaction towards visual metaphors is different across cultures. Therefore, advertisers should be aware of the preferences consumers from various cultures have regarding the use of visual metaphors. The goal of this study was to investigate the effect of meaning operation in advertisements with visual metaphors on the consumer reaction across high-context and low-context countries. The two levels of meaning operation investigated in this study were a comparison for similarity (A = like B) and a comparison for opposition (A = not like B). In addition, the study compared the consumer reaction of participants from the Netherlands (low-context) and Mexico (high-context). This was investigated by means of an experiment in which participants were shown three product advertisements containing either a comparison for similarity or a comparison for opposition, followed by several questions concerning their comprehension, appreciation and intention to act. The results of this study confirmed that visual metaphors containing a comparison for similarity led to higher consumer’s comprehension than a comparison for opposition. Contrary to the expectation that more complex stimuli lead to higher appreciation, visual metaphors containing a comparison for similarity led to a more positive consumer reaction than a comparison for opposition, for participants from both low-context and high-context cultures. No difference was found between the low-context and high-context cultures regarding their comprehension of and appreciation for visual metaphors. Comprehension, perceived complexity and comparability of visual metaphors were found to be predictors for the consumer reaction. The findings of this study indicate that the safe option for product advertisers is to use visual metaphors containing a comparison for similarity rather than a comparison for opposition.

Key words: visual metaphor, advertisements, meaning operation, context culture, high vs. low context communication, comprehension, appreciation, intention to act
1. Introduction

Over the years the use of visual metaphors in advertisements has increased (Phillips & McQuarrie, 2002). This strategy seems to have positive effects, as a previous study found that advertisements that include a visual metaphor are appreciated more than advertisements without a metaphor (Van Mulken, Van Hooft & Nederstigt, 2014). A brand that abundantly uses visual metaphors in its advertisements is Heinz Ketchup. The two advertisements shown below both include a visual metaphor. At a close look, the image in Figure 1 contains two objects: the bottom of a ketchup bottle and the sepals of a tomato. The advertiser fused these two objects with the purpose of consumers comparing them, indicating that Heinz Ketchup is like eating fresh tomatoes. The advertisement in Figure 2 includes a cardboard egg together with a Heinz Ketchup bottle below. The metaphor in this advertisement is that eating an egg without Heinz Ketchup is similar to eating cardboard; the product will improve the taste of your food.

Both of these advertisements focus on the taste of Heinz Ketchup but are constructed in very different ways. The visual metaphor in advertisement 1 shows a similarity (i.e. Heinz Ketchup tastes like fresh tomatoes), whereas the visual metaphor in advertisement 2 shows an opposition (i.e. your food will not taste like bland cardboard if you add Heinz Ketchup). As Heinz Ketchup is a global brand with a global marketing strategy it is important for them to map cultural communication preferences. This study focuses on the effects of advertisements with visual metaphors containing a comparison for similarity or a comparison for opposition across consumers from the Netherlands and Mexico.

Figure 1. Advertisement for Heinz Ketchup.

Figure 2. Advertisement for Heinz Ketchup.
Visual metaphor constructs

A metaphor can be best described as the way in which a person conceptualizes one mental domain in terms of another (Lakoff, 1993). “Time is a thief” is a metaphor that illustrates the feeling that time is passing by quickly. Time is not literally a thief, but it is conceptualized as a figurative thief (i.e. taken away from you without noticing). The actual domain, in this case time, can be described as the target domain. The figurative domain, in this case a thief, can be described as the source domain. Similar to verbal metaphors, the same two domains occur in visual metaphors. In the metaphor in Figure 1 the target domain is a Heinz Ketchup bottle, and the source domain is a tomato. The difference between verbal and visual metaphors is that visual metaphors are more implicit than the verbal ones (McQuarrie & Phillips, 2004). Therefore, one can convey a message through a visual metaphor without actually verbally expressing it. For this reason, visual metaphors are more open to different interpretations than verbal metaphors.

The target domain and source domain in visual metaphors can be constructed in many different ways. Two proposed taxonomies that are similar are those by Phillips and McQuarrie (2004) and Forceville (2008). This study will look at the typology proposed by Phillips and McQuarrie (2004). The typology by Phillips and McQuarrie (2004) to categorize the different ways in which visual metaphors can be constructed is based on two dimensions: the visual structure and the meaning operation of a visual metaphor.

The visual structure refers to the way in which the target domain and the source domain are composed together, distinguishing three possibilities that will be further elaborated in the next paragraph: juxtaposition, fusion and replacement. The visual structure of a visual metaphor determines the degree of complexity (Phillips & McQuarrie, 2004). The second dimension, the meaning operation, refers to the degree of processing opportunity available to understand the link between the target domain and the source domain. Again, three possibilities that will be further elaborated in the next paragraph can be distinguished: connection, comparison for similarity and comparison for opposition. The meaning operation of a visual metaphor determines the degree of ambiguity (Phillips & McQuarrie, 2004). As each visual metaphor consists of both dimensions, this leads to nine combinations in total (see Figure 3).
According to Phillips and McQuarrie (2004), the complexity of a visual metaphor is determined by its visual structure. The easiest visual structure that a visual metaphor can consist of is juxtaposition (Phillips & McQuarrie, 2004). An example of juxtaposition can be found in Figure 4. This advertisement by Land Rover shows a car alongside two hippos, comparing the robustness of the car to that of a hippo. In this visual structure, the target domain is placed next to the source domain. This visual structure is easiest to comprehend, as the only thing a consumer has to do is process the comparison that is being made by the advertiser.

The second possible visual structure is fusion. Fusion is considered more complex than juxtaposition, as it merges both the target and source domain (Phillips & McQuarrie, 2004). The advertisement of Heinz Ketchup in Figure 1 is an example of fusion. In this image, the bottle and tomato are fused into one new image. According to Phillips and McQuarrie (2004), this visual structure requires more cognitive effort. Before the consumer can interpret the comparison being made (e.g. taste), the consumer has to identify which characteristics are used for the comparison (e.g. bottle and tomato).

According to Phillips and McQuarrie (2004), the most complex visual structure is a replacement. In an advertisement using a replacement metaphor, the source domain replaces the target domain. The example of replacement by Nokia (Figure 5) shows a hand holding a guitar. This guitar takes the place of a Nokia phone, with the comparison that they both
produce good sound. Without knowing that Nokia produces mobile phones, or text to further explain the comparison, a replacement can be difficult to comprehend.

**Meaning operation.** The second dimension is meaning operation. According to Phillips and McQuarrie (2004), the meaning operation of a visual metaphor determines the ambiguity of the link between the target and source domain. The meaning operation with the lowest ambiguity according to Phillips and McQuarrie (2004) is a connection. Connection refers to a metaphor that consists of a target domain that is associated with a source domain (‘A is associated with B’). An example is given in Figure 6. This advertisement for diet bread shows a slice of bread and a scale. The connection between these domains is that by eating diet bread instead of regular bread, one will lose weight. In this visual metaphor, the target domain and source domain do not share similar characteristics but are merely connected.

In addition to a connection are two levels of meaning operation that are based on similar characteristics of the target and source domain: comparison for similarity (‘A is like B’) and comparison for opposition (‘A is not like B’) (Phillips & McQuarrie, 2004). The example of Heinz Ketchup in Figure 1 includes a comparison for similarity. The advertiser is indicating that the ketchup is similar to fresh tomatoes. According to Phillips and McQuarrie (2004) a comparison for similarity is less ambiguous than a comparison for opposition. Due to its higher ambiguity, a visual metaphor with a comparison for opposition requires more cognitive effort from the consumer, because consumers first have to identify the similarities between the target and source domain before they can comprehend the difference that is being illustrated (Phillips & McQuarrie, 2004). The Heinz Ketchup advertisement in Figure 2 is an example of a comparison for opposition. Consumers first have to identify that the shared
characteristic between the cardboard egg and the ketchup bottle is taste before they can comprehend the intended message: your food will not be bland anymore if you add Heinz Ketchup. Therefore, more cognitive effort is required for a comparison for opposition than for a comparison for similarity (Phillips & McQuarrie, 2004).

The influence of complexity on appreciation

According to Phillips and McQuarrie (2004), the visual structure and meaning operation of a visual metaphor both determine how much cognitive effort is needed to comprehend the visual metaphor. The Heinz Ketchup advertisement in Figure 1 (comparison for similarity) is expected to require less cognitive effort than the advertisement in Figure 2 (comparison for opposition), due to the difference in meaning operation. Various theories exist concerning the question whether an easy or more difficult to comprehend visual metaphor will be appreciated most by consumers. One theory that predicts an easier to comprehend visual metaphor will lead to higher appreciation is Fluency Theory (Reber, Schwarz & Winkielman, 2004). Three theories that predict a more difficult to comprehend visual metaphor will lead to higher appreciation are Relevance Theory (Sperber & Wilson, 1995), the inverted U-curve of complexity (Berlyne, 1971) and the Pleasure-Interest Model of Aesthetic Liking (Graf & Landwehr, 2015). These four theories will be further elaborated below.

*Fluency Theory.* The first theory to be discussed is Fluency Theory (Reber et al., 2004). Fluency theory proposes that the more fluently perceivers can process stimuli, the more positive their response will be. Reber et al. (2004) distinguish two levels of processing
fluency: perceptual fluency (i.e. how easily stimuli can be identified) and conceptual fluency (i.e. how easily the meaning of stimuli can be interpreted). Fluency Theory proposes that stimuli that require less cognitive effort lead to higher appreciation, due to the speed and accuracy of the processing. Based on this theory it can be argued that a visual metaphor with a comparison for similarity will be appreciated more than a comparison for opposition, because according to Phillips and McQuarrie (2004) this construct requires less cognitive effort.

**Relevance Theory.** Relevance Theory by Sperber and Wilson (1995) proposes that people are willing to invest more cognitive effort in processing stimuli if they expect the outcome to be relevant to them. Consequently, the more effort is spent in trying to understand a stimulus, the more satisfied the receiver will be if the stimulus is comprehended. If more complex stimuli provide a meaningful message, this can outweigh the ease of fluency (Reber et al., 2004). Hence, Relevance Theory proposes that stimuli that contain the right amount of complexity can lead to higher satisfaction than stimuli that ask for low cognitive effort. This theory could predict that a visual metaphor containing a comparison for opposition with the right amount of complexity can lead to higher appreciation than a comparison for similarity, due to the more cognitive effort required.

**Inverted U-curve of complexity.** Relevance Theory also predicts that if a receiver needs to invest more cognitive effort in comprehending a stimulus than they think is worth it, this can lead to frustration (Sperber & Wilson, 1995). This relationship between complexity and a receiver’s appreciation of the stimulus is further developed in terms of an inverted U-curve. Berlyne (1971) was the first to introduce this inverted U-curve. According to Berlyne (1971) arousal can occur if stimuli contain novelty, uncertainty or complexity. The inverted U-curve refers to the positive effect complexity has until a certain tipping point. Both stimuli that ask for very low cognitive effort (the left side of the inverted U) and stimuli that ask for very high cognitive effort (the right side of the inverted U) can lead to a negative response.

**PIA model.** The Pleasure-Interest Model of Aesthetic Liking (PIA model) by Graf and Landwehr (2015) describes this process in terms of the earlier mentioned perceptual and conceptual processing. Both perceptual and conceptual processing undergo two hierarchical phases: automatic and controlled processing (Graf & Landwehr, 2015). During automatic processing details of stimuli are left out. If the receiver expects the stimulus to be relevant enough, controlled processing will start. This phase includes a conscious interpretation of the stimulus, including details. If the stimulus is very easy to comprehend, the controlled processing phase will be completed quickly. This can result in boredom. The receiver was
willing to invest cognitive effort in the stimulus but has no opportunity to do so. If the stimulus is too complex however, the goal of comprehension cannot be reached. This results in the consumer being frustrated and confused (Graf & Landwehr, 2015). Therefore, the right amount of cognitive effort has to be found to lead to the highest appreciation. Based on the inverted U-curve of complexity and the PIA model it can be expected that a visual metaphor containing a comparison for opposition can lead to higher appreciation than a comparison for similarity, provided that it does not surpass the tipping point of being too complex. The problem, however, is that the tipping point between these two has not yet been determined.

The influence of comprehension on appreciation

Van Mulken, Van Hooft and Nederstigt (2014) have aimed to find the tipping point of the inverted U-curve in terms of the complexity of a metaphor’s visual structure, according to Phillips and McQuarrie’s (2004) typology. In their study 485 participants from France, Germany, the Netherlands and Spain, judged 16 different advertisements with visual metaphors varying in their degree of complexity (juxtaposition, fusion or replacement). The meaning operation in this study was kept constant at comparison for similarity. In line with Relevance Theory, the results showed that fusions (moderate complexity) were appreciated more than juxtapositions (low complexity), and replacements (high complexity) were appreciated less than fusions. Hence, the most appreciated visual structure of metaphors is fusion, and replacements surpass the tipping point. An important factor in the appreciation of complexity in visual metaphor is comprehension. The study by Van Mulken et al. (2014) showed that the visual structure of a metaphor has a direct effect on comprehension, and comprehension has a direct effect on appreciation.

A study by Van Mulken, Le Pair and Forceville (2010) also compared consumer’s appreciation of the visual structure (juxtaposition, fusion or replacement) of visual metaphors. They compared the appreciation of consumers from three European countries: Spain, France and the Netherlands. In this study, the meaning operation of the stimuli is not mentioned. Similar to the findings of Van Mulken et al. (2014) fusion was the most appreciated visual structure among all three nationalities. The findings of the study show three predictors of appreciation for visual metaphors: there is a negative effect of perceived complexity, a positive effect of deviation from expectation and a positive effect of comprehension. The studies by Van Mulken et al. (2014) and Van Mulken et al. (2010) indicate that comprehension is an important moderator for the appreciation of visual
metaphors. Therefore, it could be expected that visual metaphors that contain the right balance between complexity and comprehensibility will be appreciated most by consumers.

**High vs. low context cultures**

The previous paragraph discussed that comprehension is an important factor for the appreciation of visual metaphors. A previous study by Le Pair and Van Mulken (2008) found that an important factor influencing comprehension is cultural background. The study by Le Pair and Van Mulken (2008) showed that comprehension is different between consumers from various countries, with regard to the visual structure of visual metaphors. They studied the perceived complexity of the three visual structures of visual metaphors across three countries. The results showed that Dutch participants perceived the visual metaphors as more complex than the Spanish participants (Le Pair & Van Mulken, 2008). According to Le Pair and Van Mulken (2008) this can be explained by Hall’s (1976) Context Theory. Context Theory is based on the amount of information and the degree of context used in a culture’s everyday communication. It is a dimension that distinguishes cultures with a low-context communication style (e.g. Dutch) from cultures with a high-context communications style (e.g. Spanish).

People from cultures with a low-context communication style tend to communicate in an explicit way, using mainly straightforward verbal communication (Hall, 1976). Western countries in Northern Europe, Scandinavia and the United States of America have a low-context communication style (Nam, 2015). People from cultures with a high-context communication style, on the other hand, tend to communicate in an implicit way. They use fewer verbal messages and less detail and extract most information from non-verbal cues (Hall, 1976). This communication style is largely seen in the Middle East, Africa, Asia and Latin-America (Nam, 2015). People from high-context cultures are used to processing non-verbal communication. As a result, it can be argued that people from high-context cultures have a better comprehension of images and symbols than people from low-context cultures (Xie, Rau, Tseng, Su & Zhao, 2008). Hence, it can be expected that people from high-context cultures can comprehend complex visual metaphors better, resulting in higher appreciation from this group (Hornikx & Le Pair, 2017).

A recent empirical study by Hornikx and Le Pair (2017) also confirms the difference in comprehension and appreciation between people from high-context and low-context cultures, with regard to the visual structure of visual metaphors. In this study, visual metaphors with the three different visual structures (juxtaposition, fusion and replacement)
were shown to Belgian (high-context) and Dutch (low-context) participants. The results show that the Belgian participants scored lower on perceived complexity, and higher on the appreciation for the more complex visual metaphors.

**The current study**

As mentioned before, visual metaphors are constructed on two dimensions: the visual structure and the meaning operation. The above-mentioned literature shows that several previous studies have focused on the comprehension of and appreciation for visual metaphors with regard to the visual structure. However, few studies have focused on the effect of the various meaning operations of visual metaphors. Phillips and McQuarrie (2004) stated that the meaning operation of a visual metaphor determines its ambiguity, and therefore the cognitive effort required to comprehend the visual metaphor. To the author’s knowledge, it has not been empirically tested if a visual metaphor containing a comparison for opposition is indeed more complex to comprehend than a comparison for similarity. Only these two levels of meaning operation are studied, as adding a third level goes beyond the scope of this thesis. In addition, these two levels share similar characteristics (i.e. both comparisons) and are therefore better comparable than the meaning operation of a connection.

The current study aims at gaining insight into the difference between visual metaphors containing a comparison for similarity and a comparison for opposition, with regard to the consumer’s comprehension and consumer reaction. Additionally, the current study aims at testing for differences between participants from a high-context and low-context culture. As a comparison for opposition requires more cognitive effort than a comparison for similarity, it can be expected that participants from a high-context culture comprehend these better than participants from low-context cultures, resulting in a more positive consumer reaction. In the current study participants from Mexico (high-context) are compared to participants from the Netherlands (low-context).

This leads to the following research question: **How does the meaning operation of a visual metaphor (comparison for similarity vs. comparison for opposition) in Dutch (low-context culture) and Mexican (high-context culture) advertisements influence the comprehension and consumer reaction?** This research question is split into four questions. Question 1 focuses on the effects of the meaning operation in visual metaphors on comprehension and consumer reaction, question 2 focuses on the effects of high/low-context culture on the comprehension of and consumer reaction towards visual metaphors and
question 3 focuses on the influence of comprehension. Various hypotheses were created for each question:

RQ1: Is there a difference between visual metaphors containing a comparison for similarity and a comparison for opposition on the consumer’s comprehension and consumer reaction?  
   H1: Visual metaphors containing a comparison for opposition are more difficult to comprehend than visual metaphors containing a comparison for similarity. 
   H2: Visual metaphors containing a comparison for opposition lead to a more positive consumer reaction, due to the more cognitive effort needed. 

RQ2: Is there a difference between low-context cultures and high-context cultures concerning their comprehension of, and consumer reaction towards, visual metaphors containing a comparison for similarity and a comparison for opposition?  
   H3: High-context cultures have a better comprehension of visual metaphors than low-context cultures (regardless of meaning operation). 
   H4: High-context cultures have a more positive consumer reaction towards visual metaphors than low-context cultures (regardless of meaning operation). 
   H5: Low-context cultures have a more positive consumer reaction towards visual metaphors containing a comparison for similarity than a comparison for opposition. 
   H6: High-context cultures have a more positive consumer reaction towards visual metaphors containing a comparison for opposition than a comparison for similarity. 

RQ3: What is the influence of comprehension of visual metaphors on the consumer reaction?  
   H7: Higher comprehension will lead to a more positive consumer reaction.
2. Method

To study the influence of meaning operation in visual metaphors on the comprehension and consumer reaction of both Dutch and Mexican participants, several product advertisements containing visual metaphors were created. A pre-test and main experiment were executed in order to answer the research questions. This method section will define both the pre-test and experiment.

2.1 Materials

The independent variables of this study are the meaning operation of visuals metaphors (comparison for similarity vs. comparison for opposition) and the nationality of the participants (the Netherlands / low-context vs. Mexico / high-context). Both of the independent variables are nominal.

A total of six sets of product advertisements were created by the author in Adobe Photoshop. Each set consisted of two advertisements: one with a comparison for similarity and one with a comparison for opposition. The following six products were advertised: gum, women’s razor, fabric softener, energy bar, body cream and toothpaste. Six different products were chosen with the aim to minimize the influence of personal product preference of the participants. All advertisements were created on a similar neutral background, with the visual metaphor in the centre of the advertisement, and an image of the product and brand the name below. The advertisements contained a fictional brand name, translated to Dutch and Spanish (e.g. ‘Grainz energiereep’ and ‘Grainz barra energética’). The visual structure of the visual metaphors was kept constant at juxtaposition level, as this visual structure is easiest to comprehend (Phillips & McQuarrie, 2004) and therefore least likely to have a significant influence on the outcome. Aside from the differences in meaning operation and product choice, the advertisements were kept as similar as possible (i.e. equal background colour, font and object placement). Figure 7 shows an example of two advertisements for one product, for the Dutch and Mexican respondents. The remaining advertisements can be found in appendix A.

The second independent variable, nationality, consisted of two levels (Dutch vs. Mexican). The participants received the questionnaire in their own language. The questionnaire was initially created in English, and was translated into Dutch and Spanish with the translation-back translation method.
2.1.1 Pre-test

Since the stimuli were newly created, it was necessary to execute a pre-test to test for the consistency of multiple variables among the stimuli. The pre-test was performed with a questionnaire using Qualtrics. A within-subjects design was used. A total of 18 participants completed the pre-test. For practical reasons the pre-test was completed by 17 Dutch participants, and one Mexican. Six males and twelve females participated in the pre-test, with a mean age of 32.5 years old ($SD = 14.39$). Participants were approached online, in the personal network of the researcher (i.e. via WhatsApp). The duration of the questionnaire in the pre-test was roughly 20 minutes.

In order to test the consistency of the new stimuli, the pre-test measured four dependent variables: comprehension, attractiveness, perceived complexity and comparability. The participants were shown all twelve advertisements, followed by two questions per variable for each advertisement. First, participants were asked about their perceived comprehension of the visual metaphor on a 7-point Likert scale (completely don’t understand – completely understand). Participants were asked to explain the intended message of the
advertisement, which was later translated into a score by the researcher (i.e. the actual comprehension score). Attractiveness was measured by two questions on a 7-point Likert scale (This advertisement is: not attractive – attractive, badly chosen – well chosen). As were perceived complexity (The intended message is: difficult to understand – easy to understand, complex – simple) and comparability (The two objects being compared are: not connected – connected, not compatible – compatible). The reliability was tested for all four variables for all twelve advertisements and was sufficient (Cronbach’s Alpha between $\alpha = .75$ and $\alpha = .99$). A table with all Cronbach’s Alpha of the pre-test can be found in appendix B. The complete questionnaire can be seen in appendix C.

Of the six sets of advertisements, three sets with the highest mean scores per variable were eventually used in the main experiment. The tables below show an overview of the mean scores of the variables for the advertisements containing a comparison for similarity (table 1) and opposition (table 2). In total, the advertisements for the women’s razor and body cream both had the highest mean score seven times. Both the advertisements for the energy bar and toothpaste scored highest three times. As the advertisement for the energy bar had a higher total mean score, this product was chosen. Therefore, the three product advertisements that were used in the main experiment are: women’s razor, body cream and energy bar. The advertisements used in the main experiment can be found in appendix A.

<table>
<thead>
<tr>
<th>Product (similarity)</th>
<th>Actual Comprehension M (SD)</th>
<th>Appreciation M (SD)</th>
<th>Perceived Complexity M (SD)</th>
<th>Comparability M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gum</td>
<td>2.94 (0.24)</td>
<td>4.88 (1.10)</td>
<td>6.06 (1.00)*</td>
<td>5.88 (1.04)*</td>
</tr>
<tr>
<td>Razor</td>
<td>3.00 (0.00)*</td>
<td>5.44 (1.38)*</td>
<td>6.50 (0.61)*</td>
<td>6.00 (1.53)*</td>
</tr>
<tr>
<td>Fabric softener</td>
<td>2.76 (0.56)</td>
<td>5.06 (1.46)*</td>
<td>5.44 (1.67)</td>
<td>5.09 (1.81)</td>
</tr>
<tr>
<td>Energy bar</td>
<td>3.00 (0.00)*</td>
<td>4.91 (1.80)</td>
<td>5.74 (1.08)</td>
<td>4.80 (1.89)</td>
</tr>
<tr>
<td>Body cream</td>
<td>2.82 (0.39)</td>
<td>5.53 (1.30)*</td>
<td>5.79 (1.47)*</td>
<td>5.59 (1.67)*</td>
</tr>
<tr>
<td>Toothpaste</td>
<td>3.00 (0.00)*</td>
<td>4.74 (1.82)</td>
<td>5.56 (1.82)</td>
<td>4.91 (1.95)</td>
</tr>
</tbody>
</table>

* Products with three highest means per variable.
Table 2. Mean scores and standard deviations of actual comprehension (scale 1-3), appreciation, perceived complexity and comparability (scale 1-7) for six visual metaphors containing a comparison for opposition in the pre-test.

<table>
<thead>
<tr>
<th>Product (opposition)</th>
<th>Actual Comprehension M (SD)</th>
<th>Appreciation M (SD)</th>
<th>Perceived Complexity M (SD)</th>
<th>Comparability M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gum</td>
<td>1.82 (0.81)</td>
<td>2.59 (1.35)</td>
<td>4.09 (2.00)</td>
<td>3.09 (2.46)</td>
</tr>
<tr>
<td>Razor</td>
<td>2.12 (0.78)*</td>
<td>3.06 (1.68)</td>
<td>4.15 (1.79)*</td>
<td>3.32 (2.22)*</td>
</tr>
<tr>
<td>Fabric softener</td>
<td>1.94 (0.97)</td>
<td>3.21 (1.69)*</td>
<td>3.71 (1.66)</td>
<td>3.06 (1.98)</td>
</tr>
<tr>
<td>Energy bar</td>
<td>2.12 (0.93)*</td>
<td>4.25 (1.60)*</td>
<td>4.12 (1.38)</td>
<td>3.24 (2.09)</td>
</tr>
<tr>
<td>Body cream</td>
<td>2.24 (0.90)*</td>
<td>3.50 (1.62)*</td>
<td>4.41 (1.86)*</td>
<td>3.65 (2.31)*</td>
</tr>
<tr>
<td>Toothpaste</td>
<td>2.12 (0.99)</td>
<td>2.65 (1.46)</td>
<td>4.59 (1.89)*</td>
<td>4.00 (2.17)*</td>
</tr>
</tbody>
</table>

* Products with three highest means per variable.

2.2 Subjects

A total of 62 Dutch participants and 64 Mexican participants completed the questionnaire. 29 Dutch participants and 33 Mexican participants were shown the visual metaphors containing a comparison for similarity. 33 Dutch participants and 31 Mexican participants were shown the visual metaphors containing a comparison for opposition. Of the participants, 35 were male (27.6%) and 91 were female (71.6%). The remaining participant (0.8%) answered ‘other’. The age of the participants ranged from 18 to 62 years old, with an average age of 27.5 (SD = 8.77). Of the 127 participants 60 were students (39.4%), 65 working (51.2%) and 12 participants answered ‘other’ (9.4%).

In order to check for equal distribution of gender and age between the two conditions several analyses were conducted. A Chi-square test showed no significant relation between condition and gender for the Dutch participants ($X^2 (2) = .955, p = .620$), and no significant relation between condition and gender for the Mexican participants ($X^2 (1) = 3.62, p = .057$). In addition, a one-way analysis of variance showed no significant difference in age between the two conditions for the Dutch participants ($F (1,60) = .09, p = .770$), and no significant difference in age between the two conditions for the Mexican participants ($F (1,63) = 2.87, p = .095$). It is therefore assumed that gender and age distributions were equal for both conditions.

In order to check for equal distribution of gender and age between the Dutch and Mexican participants several analyses were conducted. A Chi-square test showed no significant relation between culture and gender for condition 1 (comparison for similarity)
(X^2 (1) = .20, p = .658), and no significant relation between culture and gender for condition 2 (comparison for opposition) (X^2 (2) = 2.45, p = .294). In addition, a one-way analysis of variance showed no significant difference in age between the two cultures for condition 1 (F (1,60) = .17, p = .684), but a significant difference in age between the two cultures for condition 2 (F (1,63) = 7.00, p = .010).

2.3 Design

The experiment consisted of a 2 (comparison for similarity vs. comparison for opposition) x 2 (the Netherlands vs. Mexico) between subjects design. Each participant was randomly exposed to three advertisements from one meaning operation (comparison for similarity or opposition). The experiment was performed with a questionnaire using Qualtrics. A between-subjects design was chosen for the following reasons: to minimize the learning effect and to prevent participants from having to invest too much time in answering the questionnaire.

2.4 Instruments

The dependent variables are comprehension and consumer reaction. In this study consumer reaction was operationalized in terms of appreciation and intention to act. All three variables are at interval level, as they were measured via 7-point Likert scales.

The participants were asked to answer questions concerning comprehension, appreciation and intention to act for three advertisements of one construct. Comprehension was measured in two steps: estimated comprehension as reported by the participant on a 7-point Likert scale (completely don’t understand – completely understand) and actual comprehension as a score given by the researcher. Actual comprehension was rated on a scale of 1 to 3 for the degree of correctness after asking the participant for an explanation of the visual metaphor in his or her own words. A score 1 was given if the explanation of the metaphor was wrong (e.g. this razor makes your legs shiny). A score 2 was given if the intended effect of the product was mentioned, without mentioning of the source domain (e.g. this razor makes your legs soft). A score 3 was given if the intended effect of the product was mentioned, including the target and source domain (e.g. this razor makes your legs as soft as silk).

Appreciation was measured by three questions, using 7-point Likert scales: ‘This advertisement is: unattractive – attractive, badly chosen, well chosen, not enjoyable to look at – enjoyable to look at’ (based on Hornikx & Le Pair, 2017). Crombach’s Alpha for this scale
was measured for all six advertisements, resulting in $\alpha = .837$ in the lowest case. A table with all Cronbach’s Alpha for all variables can be found in appendix D.

Intention to act was also measured by three questions, using 7-point Likert scales: ‘I would consider buying this product’, ‘I would recommend this product to my friends’ (based on Van Mulken et al., 2014) and ‘This product could be something for me’ (based on Van Hooft et al., 2013). Cronbach’s Alpha for this scale was measured for all six advertisements, resulting in $\alpha = .808$ in the lowest case.

The control variables perceived complexity and comparability were again measured based on the 7-point Likert scales by Hornikx & Le Pair (2017) and Gkiouzepas and Hogg (2011). Perceived complexity was measured by the three questions: ‘The intended message is: hard to understand – easy to understand’, ‘complex – simple’, ‘unclear – clear’. Comparability was measured by the three questions: ‘The two objects being compared are: unrelated – related’, ‘dissociated – connected’ and ‘illogical together – logical together’. Cronbach’s Alpha for this scale was measured for all six advertisements. The Cronbach’s Alpha for perceived complexity was $\alpha = .917$ in the lowest case. The Cronbach’s Alpha for comparability was $\alpha = .876$ in the lowest case. In addition, the control variable need for cognition was added. Need for cognition was measured according to the 17 questions by Cacioppo, Petty and Kao (2013), on a 7-point Likert scale. The Cronbach’s Alpha for this scale was $\alpha = .801$.

The high/low-context scores were checked according to the 17 questions by Richardson and Smith (2007), on a 7-point Likert scale. The Cronbach’s Alpha for this scale was $\alpha = .808$. The questionnaire ended with demographic questions (i.e. age, gender and occupation). The complete questionnaire in Dutch and Spanish language can be seen in appendix E.

2.5 Procedure

Participants were approached online. The Dutch participants were asked in the personal network of the researcher, via social media (i.e. WhatsApp and Facebook) and word-of-mouth. A total of six Mexican participants were approached through e-mail in the personal network of the researcher. Subsequently, the remaining Mexican participants were asked via snowball sampling. Of all participants that completed the questionnaire, the average duration to complete the questionnaire was 14 minutes. The Dutch participants were motivated by having a chance of winning a €15 Bol.com gift card.
The introduction of the questionnaire informed the participants about the aim of the research (i.e. ‘To evaluate the effect of various designs of product advertisements’), the expected duration and information about the procedure. Participants were informed that participation was completely voluntary and that they could withdraw from the questionnaire at any moment. Before being able to start the questionnaire, participants had to actively agree that they read and understood the provided information and were at least 18 years old. The full introduction text can be found in appendix E.

2.6 Statistical treatment

Two-way analysis of variance was used to statistically test the effect of meaning operation (comparison for similarity vs. opposition) and nationality (Dutch vs. Mexican) on comprehension, appreciation and intention to act. One-way analysis of variance was used to statistically measure the difference in high/low-context score between the two nationalities. Simple regression analysis was used to statistically test the effect of comprehension, need for cognition, perceived complexity and comparability on appreciation and intention to act.

2.7 Data preparation

After checking the reliability of the multiple questions per variable, various one-way analyses of variance were computed to measure whether the advertisements in the same condition lead to similar results. A one-way analysis of variance was computed for the variables appreciation and intention to act, for the three advertisements per condition (i.e. comparison for similarity and comparison for opposition). Both the variables appreciation (Dutch: $F(2,84) = 2.04, p = .136$, Mexican: $F(2,96) = 2.23, p = .113$) and intention to act (Dutch: $F(2,84) = 1.02, p = .363$, Mexican: $F(2,96) = 1.27, p = .287$) did not significantly differ from each other among the three advertisements containing a comparison for similarity. The variable appreciation also did not significantly differ among the three advertisements containing a comparison for opposition (Dutch: $F(2,96) = 1.98, p = .144$, Mexican: $F(2,93) = 2.92, p = .059$). However, the advertisements containing a comparison for opposition did significantly differ from each other on the variable intention to act ($F(2,93) = 8.87, p < .001$). The intention to act for advertisement ‘body cream’ ($M = 4.41, SD = 1.47$) was higher than the intention to act for advertisements ‘razor’ ($p < .001$, Bonferroni-correction; $M = 3.04, SD = 1.72$) and ‘energy bar’ ($p = .032$, Bonferroni-correction; $M = 3.68, SD = 1.59$). There was no significant difference between advertisements ‘razor’ and ‘energy bar’ ($p = .067$, Bonferroni-correction). For this reason, in the further analysis the variable intention to act
will be split into intention to act ‘razor + energy bar’, and intention to act ‘body cream’. Of the data of the variable appreciation for both comparison for similarity and opposition, and intention to act for comparison for similarity, the mean of the advertisements was used.

Both the estimated comprehension as reported by the respondent (on a 7-point Likert scale) and the actual comprehension as a given score by the researcher (on a scale of 1-3) were recorded. A simple linear regression analysis showed that the variable entered, estimated comprehension, explained 79% of the variance in actual comprehension ($F(1,378) = 33.56, p < .001$). Estimated comprehension was shown to be a significant predictor of actual comprehension ($\beta = .29, p < .001$). This means that when estimated comprehension increases with 1 standard deviation, actual comprehension will increase with 0.29 standard deviation. In the further analyses only estimated comprehension was used, as this was recorded on the same 7-point Likert scale as the other variables.
3. Results

This chapter is divided into four paragraphs. First, the context scores of the nationalities will be given. Then, the effects of the independent variables on the dependent variables are stated, followed by the influence of comprehension. The last paragraph provides the results of the control variables.

3.1 High/low-context cultures

A one-way analysis of variance showed a significant difference between Dutch and Mexican respondents with regard to context culture (high vs. low) \( F(1,125) = 22.11, p < .001 \). Mexican respondents scored significantly higher \( (M = 4.49, SD = 0.70) \) on the high vs. low context communication scale of Richardson and Smith (2007) than Dutch respondents \( (M = 3.90, SD = 0.71) \). Table 3 shows an overview of the mean, minimum and maximum context score of respondents from both cultures. Therefore, the Mexican respondents can be classified as high-context (HC) and the Dutch respondents as low-context (LC). In the further analyses nationality and high/low-context communication style will be seen as equivalent constructs.

<table>
<thead>
<tr>
<th>Culture</th>
<th>Context score M (SD)</th>
<th>Minimum context score</th>
<th>Maximum context score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-context</td>
<td>3.90 (0.71)</td>
<td>2.41</td>
<td>5.53</td>
</tr>
<tr>
<td>(Dutch)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High-context</td>
<td>4.49 (0.70)</td>
<td>3.00</td>
<td>6.35</td>
</tr>
<tr>
<td>(Mexican)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3.2 Dependent variables: comprehension, appreciation and intention to act

In order to study the effect of the meaning operation in visual metaphors between high and low context cultures, means of comprehension, appreciation and intention to act were investigated. Table 4 provides an overview of all means and standard deviations, split on meaning operation.
Table 4. Overview of mean scores on all three variables (comprehension, appreciation and intention to act) per culture, split on meaning operation.

<table>
<thead>
<tr>
<th>Meaning operation</th>
<th>Culture</th>
<th>Comprehension M (SD)</th>
<th>Appreciation M (SD)</th>
<th>Intention to act ‘razor + energy bar’ M (SD)</th>
<th>Intention to act ‘body cream’ M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Similarity</td>
<td>Dutch</td>
<td>5.80 (0.69)</td>
<td>4.49 (1.10)</td>
<td>4.13 (1.41)</td>
<td>3.92 (1.37)</td>
</tr>
<tr>
<td></td>
<td>Mexican</td>
<td>5.63 (0.89)</td>
<td>4.53 (1.51)</td>
<td>4.66 (1.03)</td>
<td>4.59 (1.48)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>5.71 (0.80)</td>
<td>4.51 (1.32)</td>
<td>4.41 (1.21)</td>
<td>4.27 (1.46)</td>
</tr>
<tr>
<td>Opposition</td>
<td>Dutch</td>
<td>5.33 (1.34)</td>
<td>3.92 (1.20)</td>
<td>3.10 (1.26)</td>
<td>3.98 (1.44)</td>
</tr>
<tr>
<td></td>
<td>Mexican</td>
<td>5.22 (1.29)</td>
<td>3.28 (1.31)</td>
<td>3.74 (1.47)</td>
<td>4.84 (1.39)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>5.28 (1.30)</td>
<td>3.61 (1.29)</td>
<td>3.42 (1.40)</td>
<td>4.41 (1.47)</td>
</tr>
</tbody>
</table>

### 3.2.1 Comprehension

A two-way analysis of variance with meaning operation (similarity vs. opposition) and culture (high vs. low context) as factors for comprehension showed a significant main effect of meaning operation on comprehension \((F(1,122) = 5.13, p = .025)\). Irrespective of culture, visual metaphors containing a comparison for similarity \((M = 5.71, SD = 0.80)\) were comprehended better than visual metaphors containing a comparison for opposition \((M = 5.28, SD = 1.30)\). Culture was not found to have a significant main effect on comprehension \((F(1,122) = 0.58, p = .448)\). The interaction effect between meaning operation and culture was not statistically significant \((F(1,122) = 0.02, p = .878)\).

### 3.2.2 Appreciation

A two-way analysis of variance with meaning operation (similarity vs. opposition) and culture (high vs. low context) as factors for appreciation showed a significant main effect of meaning operation on appreciation \((F(1,123) = 15.72, p < .001)\). Irrespective of culture, visual metaphors containing a comparison for similarity \((M = 4.51, SD = 1.32)\) were shown to lead to greater appreciation than visual metaphors containing a comparison for opposition \((M = 3.61, SD = 1.29)\). Culture was not found to have a significant main effect on appreciation \((F(1,123) = 1.72, p = .192)\). The interaction effect between meaning operation and culture was not statistically significant \((F(1,123) = 2.18, p = .142)\).
### 3.2.3 Intention to act (razor + energy bar)

A two-way analysis of variance with meaning operation (similarity vs. opposition) and culture (high vs. low context) as factors for intention to act (razor + energy bar) showed a significant main effect of meaning operation on intention to act ($F(1,123) = 17.79, p < .001$). Irrespective of culture, visual metaphors containing a comparison for similarity ($M = 4.41$, $SD = 1.24$) were shown to lead to greater intention to act than visual metaphors containing a comparison for opposition ($M = 3.42$, $SD = 1.40$). A second main effect was found for culture on intention to act ($F(1,123) = 6.47, p = .012$). Irrespective of meaning operation, respondents from Mexico (HC) ($M = 4.21$, $SD = 1.34$) have shown a greater intention to act than respondents from the Netherlands (LC) ($M = 3.58$, $SD = 1.42$). The interaction effect between meaning operation and culture was not statistically significant ($F(1,123) = 0.048, p = .826$).

### 3.2.4 Intention to act (body cream)

A two-way analysis of variance with meaning operation (similarity vs. opposition) and culture (high vs. low context) as factors for intention to act (body cream) showed no significant main effect of meaning operation on intention to act ($F(1,123) = 0.394, p = .531$). A significant main effect was found for culture on intention to act ($F(1,123) = 9.12, p = .003$). Irrespective of meaning operation, respondents from Mexico (HC) ($M = 4.71$, $SD = 1.44$) have shown a greater intention to act than respondents from the Netherlands (LC) ($M = 3.95$, $SD = 1.40$). The interaction effect between meaning operation and culture was not statistically significant ($F(1,123) = 0.152, p = .697$).

### 3.3 The influence of comprehension

To test if comprehension is a predictor for the consumer reaction several regression analyses were conducted. A simple linear regression analysis showed that the variable entered, comprehension, explained 11% of the variance in appreciation ($F(1,124) = 16.61, p < .001$). Comprehension was shown to be a significant predictor of appreciation towards visual metaphors ($\beta = .34, p < .001$). This means that when comprehension increases with 1 standard deviation, appreciation will increase with 0.34 standard deviation. A second simple regression analysis showed that comprehension explained 15% of the variance in intention to act (razor + energy bar) ($F(1,124) = 22.52, p < .001$). Comprehension was shown to be a significant predictor of intention to act ($\beta = .39, p < .001$). When comprehension increases
with 1 standard deviation, intention to act will increase with 0.39 standard deviation. A third simple regression analysis showed that comprehension explained 13% of the variance in intention to act (body cream) \((F(1,124) = 20.02, p < .001)\). Comprehension was shown to be a significant predictor of intention to act \((\beta = .37, p < .001)\). This means that when comprehension increases with 1 standard deviation, intention to act will increase with 0.37 standard deviation. A model with the findings is visualized in Figure 8.

Figure 8. Model of relations (\(\beta\)) between comprehension and appreciation and intention to act.

3.4 Control variables: need for cognition, perceived complexity and comparability

Three control variables were used to test for additional influences of the participants on their appreciation and intention to act: need for cognition, perceived complexity and comparability. First, multiple one-way analyses of variance were executed to compare the means of the two cultures on all three control variables. Next, one-way analyses of variance were conducted to compare the means of the two conditions on all three control variables. Finally, multiple regression analyses were conducted to test if the control variables are predictors for the consumer reaction.

3.4.1 Control variables per culture

In order to compare the means of the two cultures on need for cognition, perceived complexity and comparability, one-way analyses of variance were executed. A one-way analysis of variance showed no significant difference between the Dutch and Mexican respondents with regard to need for cognition \((F(1,125) = 2.06, p = .154)\). In addition, a one-way analysis of variance showed no significant difference between the Dutch and Mexican respondents with regard to perceived complexity \((F(1,125) = 22.11, p = .751)\). Finally, a one-way analysis of variance showed no significant difference between the Dutch and Mexican respondents with regard to comparability \((F(1,125) = 0.403, p = .527)\).
3.4.2 Control variables per condition

A one-way analysis of variance showed no significant difference between the two conditions regarding need for cognition ($F(1,125) = .049, p = .825$). A one-way analysis of variance showed a significant difference between the two conditions with regard to perceived complexity ($F(1,125) = 4.64, p = .037$), regardless of culture. The advertisements with a visual metaphor containing a comparison for opposition ($M = 4.79, SD = 1.36$) were perceived as more complex than a comparison for similarity ($M = 5.32, SD = 1.46$) (as the Likert scale went up from complex to easy, a higher mean score implies a lower perceived complexity). A one-way analysis of variance showed no significant difference between the two conditions for the comparability of the target and source domain ($F(1,125) = 3.02, p = .085$). The comparability of the visual metaphors containing a comparison for similarity ($M = 4.71, SD = 1.47$) was perceived as similar to the comparability of the visual metaphors containing a comparison for opposition ($M = 4.30, SD = 1.25$).

3.4.3 Control variables as predictors for the consumer reaction

Single regression analyses for appreciation showed that perceived complexity ($\beta = .63, p < .001$) and comparability ($\beta = .68, p < .001$) of visual metaphors are significant predictors of appreciation. Perceived complexity explains 40% of the variance of appreciation ($F(1,125) = 83.90, p < .001$), and comparability explains 45% of the variance in appreciation ($F(1,125) = 105.00, p < .001$). If perceived complexity increases (i.e. perceived as less complex) with 1 standard deviation, appreciation will increase with about two thirds of a standard deviation, given that all other factors are kept constant. Also, if comparability increases (i.e. the target and source domain are perceived as more comparable) with 1 standard deviation, appreciation will increase with about two thirds of a standard deviation, given that all other factors are kept constant. Need for cognition ($\beta = .02, p = .812$) is not a significant predictor for appreciation ($F(1,125) = 0.057, p = .812$).

Single regression analysis showed that comparability explains 3% of the variance in intention to act (razor + energy bar) ($F(1,125) = 4.30, p = .040$). Comparability was shown to be a significant predictor of intention to act ($\beta = .18, p = .040$). This means that if comparability increases with 1 standard deviation, intention to act will increase with .18 standard deviation. Need for cognition ($\beta = .00, p = .964$) is not a significant predictor for intention to act (razor + energy bar) ($F(1,125) = .002, p = .964$). Also, perceived complexity
(β = .09, p = .324) is not a significant predictor for intention to act (razor + energy bar) \( F(1,125) = .982, p = .324 \).

Single regression analyses for intention to act (body cream) showed that perceived complexity (β = .18, p = .049) and comparability (β = .28, p = .002) of visual metaphors are significant predictors of intention to act. Perceived complexity explains 2% of the variance of intention to act \( F(1,125) = 3.97, p = .049 \), and comparability explains 7% of the variance in intention to act \( F(1,125) = 10.37, p = .002 \). If perceived complexity increases with 1 standard deviation, intention to act will increase with .18 standard deviation, given that all other factors are kept constant. If comparability increases with 1 standard deviation, intention to act will increase with .28 standard deviation, given that all other factors are kept constant. Need for cognition (β = .02, p = .861) is not a significant predictor for intention to act (body cream) \( F(1,125) = .031, p = .861 \). Figure 9 and 10 visualize the significant findings for perceived complexity and comparability.

Figure 9. Model of relations (β) between perceived complexity and appreciation and intention to act.

```
Perceived complexity
  \( \beta = .63 \)
  \( \beta = .18 \)
  \( \beta = .18 \)

Appreciation

Intention to Act (body cream)
```

Figure 10. Model of relations (β) between comparability and appreciation and intention to act.

```
Comparability
  \( \beta = .68 \)
  \( \beta = .18 \)
  \( \beta = .28 \)

Appreciation

Intention to Act (razor + energy bar)

Intention to Act (body cream)
```
4. Conclusion and discussion

The use of visual metaphors in advertisements has become increasingly popular for international brands (Phillips & McQuarrie, 2002). Previous studies have shown that the use of visual metaphors in advertisements has a positive effect on the consumer reaction (Van Mulken et al., 2014; Van Mulken et al., 2010). However, the consumer reaction towards visual metaphors is also proven to be different across cultures (Le Pair & Van Mulken, 2008; Hornikx & Le Pair, 2017). Therefore, advertisers should be aware of the preferences consumers from various cultures have regarding the use of visual metaphors. The current study aimed to contribute to previous studies into the use of visual metaphors in advertisements by investigating the effect meaning operation. The study compared the consumer reaction of participants from two countries, the Netherlands and Mexico, as they significantly differed from each other with regard to Hall’s (1976) high/low-context scale.

The central question in this study was: How does the meaning operation of a visual metaphor (comparison for similarity vs. comparison for opposition) in Dutch (low-context culture) and Mexican (high-context culture) advertisements influence the comprehension and consumer reaction? This question was divided into multiple research questions: (RQ1) Is there a difference between visual metaphors containing a comparison for similarity and a comparison for opposition on the consumer’s comprehension and consumer reaction? (RQ2) Is there a difference between low-context cultures and high-context cultures concerning their comprehension of, and consumer reaction towards, visual metaphors containing a comparison for similarity and a comparison for opposition? (RQ3) What is the influence of comprehension of visual metaphors on the consumer reaction? This chapter has been divided into three parts, which will each discuss one research question and its hypotheses.

Difference between meaning operation

Firstly, it was expected that there is a difference in the consumer’s comprehension of visual metaphors containing a comparison for similarity and a comparison for opposition. Hypothesis 1 stated that visual metaphors containing a comparison for opposition would be more difficult to comprehend than visual metaphors containing a comparison for similarity. This hypothesis was supported, as comprehension was significantly lower for the advertisements with a visual metaphor containing a comparison for opposition than for a comparison for similarity (regardless of culture). In addition, hypothesis 2 stated that visual metaphors containing a comparison for opposition would lead to a more positive consumer
reaction. This hypothesis was rejected. On the contrary, visual metaphors containing a comparison for similarity significantly lead to higher appreciation and intention to act (razor + energy bar) than visual metaphors containing a comparison for opposition (regardless of culture). Only the intention to act for the advertisement for body cream did not significantly differ for similarity or opposition.

The typology by Phillips and McQuarrie (2004) predicted that the visual structure of a visual metaphor determines the level of complexity, and therefore the level of difficulty to comprehend the metaphor. According to the table by Phillips and McQuarrie (2004) the meaning operation of a visual metaphor determines its ambiguity. The results of this study show that the meaning operation of a visual metaphor also determines the comprehension of the metaphor and the perceived complexity. The results of hypothesis 2 show that visual metaphors containing a comparison for similarity lead to a more positive consumer reaction than a comparison for opposition, which could be explained by Fluency Theory (Reber, Schwarz & Winkielman, 2004). As discussed in the theoretical framework, Fluency Theory proposes that stimuli that require less cognitive effort lead to higher appreciation. As visual metaphors containing a comparison for similarity are easier to comprehend (hypothesis 1), this could explain why they are overall appreciated better.

Another explanation could be that the stimuli in this study were not complex enough. After conducting the pre-test the three products that were chosen for the main experiment were based on the highest scores per variable. Therefore, the advertisements for the three chosen products were perceived as having relatively low complexity (i.e. a high score on perceived complexity implied a low perceived complexity, as the scale went up from complex to easy). Future studies could improve this by choosing the stimuli that were perceived as more complex after conducting a pre-test. Another limitation of this study is that only the visual structure juxtaposition was used, which is the easiest visual structure. The complexity could also be increased by means of the visual structure. Previous studies have shown that the more complex visual structure fusion is appreciated better than juxtaposition (Van Mulken et al., 2010; Van Mulken et al., 2014). It would be interesting to measure the effect of meaning operation with visual metaphors consisting of the visual structure fusion or to compare the various visual structures with the various meaning operations.

In conclusion, a difference between visual metaphors containing a comparison for similarity and a comparison for opposition was found. Visual metaphors containing a comparison for similarity significantly lead to higher consumer’s comprehension. In contrary to the expectation that more complex stimuli lead to higher appreciation, a visual metaphor
containing a comparison for similarity significantly lead to higher appreciation than a comparison for opposition.

**Difference between high and low context culture**

First, as participants from the Netherlands and Mexico were being compared because of their difference high/low-context communication, it was measured if the groups significantly differed from each other. The results showed that the Dutch participants could indeed be classified as low-context and the Mexican participants as high-context. This is in line with the expectation of Hall (1976), who predicted that Latin-American countries are on the high-context side of the scale, and Northern European countries on the low-context side. Hypothesis 3 stated that, regardless of meaning operation, high-context cultures would have a better comprehension of visual metaphors than low-context cultures. This hypothesis was rejected, as there was no significant difference between the comprehension of the Dutch and Mexican respondents. Hypothesis 4 stated that, regardless of meaning operation, high-context cultures would have a more positive consumer reaction towards visual metaphors than low-context cultures. This hypothesis was rejected for appreciation but accepted for intention to act. The Mexican participants had a significantly higher intention to act after seeing the visual metaphors than the Dutch participants. Appreciation did not significantly differ between the two cultures.

It was expected that the high-context participants would have a higher comprehension of visual metaphors (hypothesis 3), due to their familiarity with processing non-verbal communication (Xie et al., 2008). Previous studies by Le Pair and Van Mulken (2008) and Hornikx and Le Pair (2017) did find a significant difference in comprehension between high-context and low-context cultures, with regard to comprehension of visual metaphors with various visual structures. One possible explanation for not finding a difference in the current study could be that the difference in high/low-context was not big enough between the Dutch and Mexican participants. According to the scale by Hall (1976) Latin-American countries are on the high-context side, but not on the extreme of the scale. Despite the difference being significant, the context scores found in this study confirm that there is not a big difference between the countries. The Dutch respondents had a mean score of 3.90 and the Mexican respondents 4.49 (on a scale of 1 to 7), which is fairly small. Future studies could compare countries that are more on the extremes of the scale, such as Germany (low-context) and Japan (high-context).
A reason for not finding a difference between the Dutch and Mexican respondents concerning their appreciation for visual metaphors (hypothesis 4) is in line with not finding a difference in comprehension (hypothesis 3). It was expected that high-context respondents would appreciate the visual metaphors more, due to their higher comprehension of the visual metaphors. Therefore it is surprising to find a significant difference in the Dutch and Mexican participants’ intention to act. A possible explanation could be that all the products portrayed in the advertisements are luxury products (razor, energy bar and body cream). According to a study by Bian and Forsythe (2011) consumers from collectivistic countries (e.g. Mexico) have a higher need for uniqueness, resulting in a higher purchase intention of luxury products than consumers from individualistic countries (e.g. the Netherlands). It would be interesting for future research to compare the intention to act of consumers from high/low-context countries between visual metaphors for necessity and luxury products.

Next, the two cultures were compared with regard to their preference in meaning operation. It was expected that the participants from low-context and high-context cultures would differ concerning their consumer reaction towards visual metaphors containing a comparison for similarity or a comparison for opposition. Hypothesis 5 stated that low-context cultures would have a more positive consumer reaction towards visual metaphors containing a comparison for similarity than a comparison for opposition, due to their familiarity with more straightforward communication. This hypothesis was partially supported, as the Dutch participants had a higher appreciation and intention to act (razor + energy bar) for the visual metaphors containing a comparison for similarity. Their intention to act for the body cream advertisement did not significantly differ between the two conditions. In addition, hypothesis 6 stated that high-context cultures would have a more positive consumer reaction towards visual metaphors containing a comparison for opposition than a comparison for similarity, due to their familiarity with more complex non-verbal communication (e.g. images). This hypothesis was fully rejected, for both appreciation and intention to act. On the contrary, the Mexican participants had a significantly higher appreciation and intention to act (razor + energy bar) for the visual metaphors containing a comparison for similarity. Similar to the Dutch participants, the intention to act for the body cream advertisement of the Mexican participants did not significantly differ between the two conditions.

Low-context cultures having a more positive consumer reaction towards visual metaphors containing a comparison for similarity could be explained by Hall’s (1976) context theory. As mentioned in the theoretical framework, low-context cultures
communicate in an explicit way, using mainly straightforward communication. It was therefore expected that the Dutch participants would prefer the more straightforward meaning operation of a comparison for similarity \((A = \text{like} B)\) than a comparison for opposition \((A = \text{not like} B)\). For similar reasons it was expected that high-context cultures would have a more positive consumer reaction towards visual metaphors containing a comparison for opposition. However, contrary to the expectation the Mexican respondents preferred the comparison for similarity. As mentioned earlier, this could be explained by the fact that the visual metaphors with the lowest perceived complexity were used in this study. More complex visual metaphors could increase the cognitive challenge and therefore the appreciation. It is also interesting that there is a difference between the product advertisements for intention to act. Both cultures do have a significant preference for the visual metaphors containing a comparison for similarity for the razor and energy bar advertisements, but no significant difference between the two conditions for the advertisement for body cream. A limitation of this study is that merely three products were used. Future studies could improve this by using more different products in the advertisements.

In conclusion, no difference was found between low-context and high-context cultures regarding their comprehension of and appreciation for visual metaphors (regardless of meaning operation). The only difference found between the two cultures was their intention to act, which was higher for the high-context participants. In addition, there was no difference between low-context and high-context cultures regarding their consumer reaction towards visual metaphors containing a comparison for similarity or a comparison for opposition. Both the low-context and high-context culture had a more positive consumer reaction for visual metaphors containing a comparison for similarity, with the exception of the intention to act for the advertisement for body cream.

**Comprehension as a predictor**

The final research question looked at the influence of comprehension. Hypothesis 7 stated that a higher comprehension of visual metaphors would lead to a more positive consumer reaction. This hypothesis was supported, as the comprehension of visual metaphors was a significant predictor for appreciation and intention to act. These results are in line with the study by Van Mulken et al. (2010), who also found that comprehension was a predictor for appreciation. In addition to comprehension, Van Mulken et al. (2010) found that perceived complexity also was a predictor for appreciation. The current study found similar results in the control variables: perceived complexity and comparability. Perceived
complexity was found to be a significant predictor for appreciation and intention to act (body cream), and comparability was found to be a significant predictor for appreciation and intention to act (razor + energy bar + body cream).

In conclusion, comprehension, perceived complexity and comparability of visual metaphors are predictors for the consumer reaction. Higher comprehension and comparability, and lower perceived complexity, will lead to a more positive consumer reaction.

**Overall conclusion**

The research question for this study was: How does the meaning operation of a visual metaphor (comparison for similarity vs. comparison for opposition) in Dutch (low-context culture) and Mexican (high-context culture) advertisements influence the comprehension and consumer reaction? It can be concluded that the results of this study mainly support Fluency Theory by Reber et al. (2004). In line with the theory by Phillips and McQuarrie (2004) visual metaphors containing a comparison for similarity were comprehended better than visual metaphors containing a comparison for opposition. In addition, both participants from the Netherlands and Mexico had a more positive consumer reaction towards visual metaphors containing a comparison for similarity than a comparison for opposition. Comprehension, as well as perceived complexity and comparability, were found to be predictors for the consumer reaction. The higher the comprehension and comparability, and lower perceived complexity, the more positive the consumer reaction is. No differences were found between the low-context and high-context cultures regarding their comprehension of and consumer reaction towards visual metaphors. An implication for the field of product advertising is that the safe option is to use visual metaphors containing a comparison for similarity rather than a comparison for opposition, as both low-context and high-context cultures seem to prefer this meaning operation. However, it is necessary for additional research to compare cultures that differ from each other on other aspects than context communication, and to focus more on implementing different levels of complexity in visual metaphors.
References


Appendices

Appendix A: Stimuli

Dutch advertisements
Mexican advertisements
## Appendix B: Cronbach’s Alpha pre-test

<table>
<thead>
<tr>
<th>Meaning Operation</th>
<th>Product</th>
<th>Appreciation α</th>
<th>Perceived Complexity α</th>
<th>Comparability α</th>
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<td>0.75</td>
<td>0.80</td>
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<td>Toothpaste</td>
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<td>0.95</td>
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</table>
Appendix C: Questionnaire pre-test

Beste deelnemer,

U bent uitgenodigd om deel te nemen aan een onderzoek dat wordt gedaan door een student van de Radboud Universiteit. Deze pre-test bestaat uit een enquête die ongeveer 20 minuten zal duren. Uw deelname aan het onderzoek is volledig vrijwillig en u mag de enquête op elk gewenst moment afraken. De data zal anoniem verwerkt worden.

Als u vragen heeft of meer informatie wenst over het onderzoek kunt u de student contacteren via f.reijnders@student.ru.nl

INFORMATIE OVER DE PROCEDURE
Het doel van deze pre-test is het onderzoeken van diverse ontwerpen van product advertenties. U krijgt zo 12 product advertenties te zien, die elk een metafoor bevatten. Na elke advertentie worden er een aantal vragen gesteld over de aantrekkelijkheid, complexiteit, vergelijkbaarheid en begrijpelijkheid van de advertentie.

TOESTEMMINGSVERKLARING
Door “akkoord” te selecteren verklaard u dat u:
- bovenstaande informatie heeft gelezen en volledig heeft begrepen
- vrijwillig meedoet aan dit onderzoek
- 18 jaar of ouder bent

Indien u niet akkoord gaat kunt u nu uw browser sluiten.
* Akkoord

Advertentie 1:

(Begrijpelijkheid)
1. Ik heb de boodschap van de advertentie:
   o Helemaal niet begrepen 1-2-3-4-5-6-7 Helemaal begrepen
2. Leg uit wat de boodschap van de advertentie is.

(Aantrekkelijkheid)
1. De advertentie is:
   o Niet aantrekkelijk 1-2-3-4-5-6-7 Aantrekkelijk
2. De advertentie is:
   o Slecht bedacht 1-2-3-4-5-6-7 Goed bedacht
(Complexiteit)
1. De bedoelde boodschap is:
   o Moeilijk te begrijpen 1-2-3-4-5-6-7 Makkelijk te begrijpen
2. De bedoelde boodschap is:
   o Complex 1-2-3-4-5-6-7 Simpel

(Vergelijkbaarheid)
1. De gemaakte vergelijking is:
   o Niet verwant 1-2-3-4-5-6-7 Verwant
2. De gemaakte vergelijking is:
   o Niet samenhangend 1-2-3-4-5-6-7 Samenhangend

Herhalen per advertentie

(Demografie)
1. Geslacht
   o Man
   o Vrouw
   o Anders of geen antwoord
2. Leeftijd
## Appendix D: Cronbach’s Alpha main experiment

<table>
<thead>
<tr>
<th>Meaning operation</th>
<th>Product</th>
<th>Appreciation $\alpha$</th>
<th>Intention to Act $\alpha$</th>
<th>Perceived Complexity $\alpha$</th>
<th>Comparability $\alpha$</th>
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<td>Opposition</td>
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<td>Body cream</td>
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<td>0.96</td>
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</tbody>
</table>
Appendix E: Questionnaire main experiment

Dutch questionnaire

U bent uitgenodigd om deel te nemen aan een onderzoek dat wordt gedaan door een student van de Radboud Universiteit. Het onderzoek bestaat uit een enquête die ongeveer 10 minuten zal duren. Uw deelname aan het onderzoek is volledig vrijwillig en u mag de enquête op elk gewenst moment afbreken. De data zal anoniem verwerkt worden.

Als u vragen heeft of meer informatie wenst over het onderzoek kunt u de student contacteren via f.reijnders@student.ru.nl

INFORMATIE OVER DE PROCEDURE
Het doel van dit onderzoek is het evalueren van diverse ontwerpen van product advertenties. U krijgt zo 3 product advertenties te zien. Na elke advertentie worden er een aantal vragen gesteld over de advertentie. De meeste vragen worden beantwoordt op een schaal van 7 punten. Selecteer de optie die uw mening het beste weergeeft. De enquête eindigt met een aantal vragen over uw karakter.

TOESTEMMINGSVERKLARING
Door “akkoord” te selecteren verklaard u dat u:
- bovenstaande informatie heeft gelezen en volledig heeft begrepen
- vrijwillig meedoet aan dit onderzoek
- 18 jaar of ouder bent
Indien u niet akkoord gaat kunt u nu uw browser sluiten.
* Akkoord

Advertentie 1:

(Begrijpelijkheid)
In hoeverre bent u het eens met deze uitspraak?
1. Ik heb de boodschap van deze advertentie begrepen.
   - Zeer oneens, oneens, een beetje oneens, neutraal, een beetje mee eens, mee eens, zeer mee eens
2. Leg in uw eigen woorden uit wat de boodschap van deze advertentie is.

(Gedrag)
In hoeverre bent u het eens met deze uitspraken?
1. Ik zou overwegen om dit product te kopen.
o Zeer oneens, oneens, een beetje oneens, neutraal, een beetje mee eens, mee eens, zeer mee eens
2. Ik zou dit product aanbevelen aan mijn vrienden.
   o Zeer oneens, oneens, een beetje oneens, neutraal, een beetje mee eens, mee eens, zeer mee eens
3. Dit product zou iets voor mij kunnen zijn.
   o Zeer oneens, oneens, een beetje oneens, neutraal, een beetje mee eens, mee eens, zeer mee eens

(Waardering)
Deze advertentie is:
1. Onaan trekkelijk 1-2-3-4-5-6-7 Aantrekkelijk
2. Slecht bedacht 1-2-3-4-5-6-7 Goed bedacht
3. Niet leuk om naar te kijken 1-2-3-4-5-6-7 Leuk om naar te kijken

(Complexiteit)
De bedoelde boodschap is:
1. Moeilijk te begrijpen 1-2-3-4-5-6-7 Makkelijk te begrijpen
2. Complex 1-2-3-4-5-6-7 Simpel
3. Onduidelijk 1-2-3-4-5-6-7 Duidelijk

(Vergelijkbaarheid)
De twee objecten die vergeleken worden zijn:
1. Niet verwant 1-2-3-4-5-6-7 Verwant
2. Niet samenhangend 1-2-3-4-5-6-7 Samenhangend
3. Onlogisch samen 1-2-3-4-5-6-7 Logisch samen

Herhalen per advertentie.

(Context cultuur)
1. Luisteraars moeten in staat zijn om te begrijpen wat een spreker probeert uit te drukken, zelfs als de spreker niet alles zegt wat hij wilde communiceren.
2. Sprekers mogen niet verwachten dat mensen wel zullen uitvinden wat bedoeld wordt, dit mag alleen als de bedoelde boodschap precies wordt verklaard.*
3. Een luisteraar moet de intentie van de spreker begrijpen door middel van de manier waarop de spreker praat.
4. Het is beter om het risico te nemen en te veel te zeggen dan verkeerd begrepen te worden.*
5. Het is belangrijker om een boodschap kort en bondig uit te drukken in plaats van zeer gedetailleerd
6. Zelfs als de intentie van een spreker niet exact wordt uitgesproken, zal deze maar zelden verkeerd begrepen worden.
7. De beoogde inhoud van een boodschap is belangrijker dan hoe een boodschap gecomuniceerd wordt.
8. Mensen zouden in staat moeten zijn om de betekenis van een boodschap te begrijpen door tussen de regels door te lezen.
9. Intenties die niet expliciet worden gemaakt kunnen vaak wel worden achterhaald door de context van een boodschap.
10. Een spreker mag aannemen dat toehoorders wel weten wat echt bedoeld wordt.
11. Mensen begrijpen veel dingen die niet uitgesproken worden.
12. Minder woorden leiden vaak tot beter begrip.
13. De context waarin iets gezegd wordt geeft evenveel of zelfs meer informatie dan de boodschap zelf.
14. Misverstanden worden vaker veroorzaakt door verkeerde interpretaties van de luisteraars dan het vermogen van de spreker om duidelijk te communiceren.
15. Je kunt vaak meer informatie overbrengen wanneer je minder woorden gebruikt.
16. Sommige ideeën worden beter begrepen wanneer ze onuitgesproken blijven.
17. De betekenis van een boodschap hangt vaak meer af van de context of situatie dan de gebruikte woorden.

(Behoefte aan kennis)
1. Ik geef de voorkeur aan complexe problemen in plaats van simpele problemen.
2. Ik heb graag de verantwoordelijkheid om een situatie aan te pakken die veel nadenken vereist.
3. Denken is niet mijn idee van plezier.*
4. Ik doe liever iets waar weinig denkvermogen voor nodig is dan dat ik iets doe dat mijn denkvermogen uitdaagt.*
5. Ik haal voldoening uit hard en lang nadenken.
6. Ik denk alleen zo hard als nodig is.
7. Ik denk liever na over kleine alledaagse projecten dan over projecten op de lange termijn.
8. Ik vind taken leuk waar weinig denkvermogen voor nodig is zodra ik ze geleerd heb.
9. Het idee dat mijn denkvermogen me naar de top kan brengen spreekt mij aan.
10. Ik geniet van een taak waarbij nieuwe oplossingen voor problemen moeten worden bedacht.
11. Het leren van nieuwe manieren om na te denken prikkelt me niet.*
12. Ik geef de voorkeur aan een leven vol puzzels die ik moet oplossen.
14. Ik heb liever een taak die intellectueel, moeilijk en belangrijk is, dan een taak die enigszins belangrijk is en weinig denkvermogen vereist.
15. Ik voel verlichting in plaats van voldoening na het voltooien van een taak die veel mentale inspanning vereist.*
16. Het is genoeg voor mij dat iets de klus klaart; het maakt mij niet uit hoe of waarom het werkt.*
17. Ik eindig meestal met nadenken over problemen, ook al hebben ze geen gevolgen voor mij persoonlijk.

(Demografie)
1. Geslacht
   o Man, vrouw, anders of zeg ik liever niet
2. Leeftijd
3. Nationaliteit
4. Huidige positie
   o Werkend, studerend, anders
Mexican questionnaire

Ha sido invitado a participar en un proyecto de investigación que está siendo conducido por una estudiante de la Universidad de Radboud en Holanda. El proyecto de investigación consiste en un cuestionario que tomará aproximadamente 10 minutos. Su participación es completamente voluntaria y usted podrá abandonar el cuestionario a cualquier momento. La información obtenida será completamente anónima.

Si tiene alguna pregunta o le gustaría recibir más información acerca del proyecto, por favor contacte a la estudiante via email: f.reijnders@student.ru.nl

INFORMACIÓN ACERCA DE EL PROCESO
El propósito de este proyecto de investigación es evaluar varios diseños de anuncios de productos. Se le enseñará 3 anuncios de productos. En consecuencia, se le pedirá que responda preguntas sobre los anuncios. La mayoría de las preguntas incluye una escala de 7 puntos. Por favor seleccione la opción que mejor refleje su opinión. El cuestionario terminará con preguntas sobre sus características.

CONSENTIMIENTO
Seleccionando “si estoy de acuerdo” usted está confirmando que:

- Ha leído y entendido claramente la información que se le proveyó anteriormente.
- Acepta participar voluntariamente
- Tiene al menos 18 años

* Si usted no está de acuerdo, puede ahora cerrar la ventana de su navegador.

Anuncio 1:

(Comprensibilidad)
¿Está de acuerdo con esta afirmación?
1. Yo entendí el significado de este anuncio:
   o Muy en desacuerdo, desacuerdo, algo en desacuerdo, indeciso/a, parcialmente de acuerdo, de acuerdo, muy de acuerdo
2. Por favor explique el significado de el anuncio con sus propias palabras.

(Intención de actuar)
¿Estás de acuerdo con estas afirmaciones?
1. Yo consideraría comprar este producto.
o Muy en desacuerdo, desacuerdo, algo en desacuerdo, indeciso/a, parcialmente de acuerdo, de acuerdo, muy de acuerdo
2. Yo recomendaría este producto a mis amigos.
o Muy en desacuerdo, desacuerdo, algo en desacuerdo, indeciso/a, parcialmente de acuerdo, de acuerdo, muy de acuerdo
3. Este producto podría ser algo para mí.
o Muy en desacuerdo, desacuerdo, algo en desacuerdo, indeciso/a, parcialmente de acuerdo, de acuerdo, muy de acuerdo

(Apreciación)
En una escala del 1 al 7, este anuncio es:
1. No atractivo 1-2-3-4-5-6-7 Atractivo
2. Mal elegido 1-2-3-4-5-6-7 Elegido bien
3. No agradable a la vista 1-2-3-4-5-6-7 Agradable a la vista

(Complejidad percibida)
El mensaje deseado es:
1. Difícil de entender 1-2-3-4-5-6-7 Fácil de entender
2. Complejo 1-2-3-4-5-6-7 Simple
3. No claro 1-2-3-4-5-6-7 Claro

(Comparación)
Los dos objetos en la comparación que sé está haciendo son:
1. No relacionados 1-2-3-4-5-6-7 Relacionados
2. Disociados 1-2-3-4-5-6-7 Conectados
3. Ilógicos juntos 1-2-3-4-5-6-7 lógicos juntos

Repetir por anuncio.

(Context)
1. Los oyentes deben ser capaces de entender lo que un hablante está tratando de expresar, incluso cuando el hablante no dice todo lo que pretende comunicar.
2. Un hablante no debe asumir que los oyentes interpretan correctamente lo que él dice, a no ser que la intención del mensaje haya sido formulada de forma precisa.*
3. Un oyente debe entender la intención del interlocutor por la forma de hablar de esta persona.
4. Es mejor arriesgarse a decir mucho que ser malinterpretado.*
5. Es más importante que un mensaje sea efectivo a que tenga mucho detalle.
6. Incluso si no se indica exactamente, la intención de un orador rara vez será mal entendida.
7. El contenido de un mensaje es más importante que la forma en que un mensaje es comunicado.
8. La gente debería ser capaz de entender el significado de un mensaje leyendo entre líneas.
9. El contexto suele ayudar a interpretar las intenciones no manifestadas explícitamente.
10. Un hablante puede asumir que los oyentes sabrán lo que él realmente quiere decir.
11. La gente entiende muchas cosas que no se dicen.
12. Menos palabras suelen facilitar una mejor comprensión.
13. El contexto en el que se dice algo transmite tanta o más información que el propio mensaje.
14. Los malos entendidos se deben más a una mala interpretación del contenido del mensaje por parte de los oyentes que a la incapacidad de los hablantes de hablar claro. 
15. A menudo puedes decir más con menos palabras. 
16. Algunas ideas se entienden mejor cuando no se dicen. 
17. El significado de un mensaje depende más del contexto o situación que de las palabras utilizadas. 

(Necesidad de cognición) 
1. Prefiero problemas complejos a simples. 
2. Me gusta tener la responsabilidad de manejar una situación que requiera mucha reflexión. 
3. Pensar no es mi idea de diversión. 
4. Preferiría hacer algo que requiera poca reflexión que algo que seguramente desafíe mis habilidades de pensamiento. 
5. Encuentro satisfacción en deliberaciones duras y por largas horas. 
6. Solo pienso mucho si es que tengo que 
7. Prefiero pensar en pequeños proyectos diarios que proyectos a largo plazo. 
8. Prefiero tareas que requiera poca reflexión una vez que las he aprendido. 
9. La idea de confiar en el pensamiento para llegar a la cima me atrae. 
10. Realmente disfruto de una tarea que implica encontrar nuevas soluciones a los problemas. 
11. Aprender nuevas formas de pensar no me emociona mucho. 
12. Prefiero que mi vida esté llena de rompecabezas que debo resolver. 
13. La noción de pensar de manera abstracta me atrae. 
14. Preferiría una tarea que sea intelectual, difícil e importante a una que sea algo importante pero que no requiera mucha reflexión. 
15. Siento alivio en lugar de satisfacción después de completar una tarea que requiere mucho esfuerzo mental. 
16. Es suficiente para mí que algo haga el trabajo; No me importa cómo o por qué funciona. 
17. Normalmente termino deliberaando sobre problemas incluso cuando no me afectan personalmente. 

(Demografía) 
1. Género 
   □ Masculino, femenino, otro o prefiero no decir 
2. Edad 
3. Nacionalidad 
4. Ocupación 
   □ Trabajando, estudiante, otro.