

Visual and Verbal metaphoric eConceptualization

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Abstract. In three tasks (similarity rating, feature production, sentence judgment), respondents were asked to exploit the metaphoric potential of either visual or verbal object pairs. The results showed that respondents rated the similarity of visual pairs higher than verbal pairs. Respondents also produced more perceptual and conceptual correspondences between the objects in the visual than in the verbal version. These results suggest that the metaphoric potential of pictures is probably at least as high as that of words.

Keywords: visual metaphor; text – picture; metaphoric conceptualization; similarity.

Metaphoric conceptualization in words and pictures

Metaphoric conceptualization is ubiquitous. Humans think and learn by comparing new concepts, situations, and processes with familiar ones and by mentally grouping them into familiar categories; they understand abstract concepts in terms of concrete multisensory experiences (Bowdle & Gentner, 2005; Lakoff & Johnson, 1980; Zhong & Liljenquist, 2006) the use of metaphoric conceptualization in human communication. Humans often instruct, persuade, entertain, and inform each other by analogy, comparison, and categorization. Language is a privileged communicative code to represent metaphoric conceptualization, but other communicative systems, like pictures, gesture, or music enable metaphoric communication, too.

Comparing the metaphoric potential of words and pictures is tricky. Are words intrinsically better suited to express metaphor than pictures, or is it a matter of scholarly tradition, knowing that, over the past millennia, rhetoricians put almost all their effort in studying figures of ‘speech’, thereby largely neglecting the rhetorical potential of pictures? Studying the metaphorical potential of images is faced with the problem that we do not have a reliable identification procedure, despite the available fine-grained grammatical analyses of visual communication (e.g., Kress & Van Leeuwen, 2006). Does language provide us with more stable form-meaning templates (X is (like) Y) than pictures (juxtaposition of two objects), or do we simply have a more sophisticated scholarly understanding of the verbal communicative code? Scholars in the field of metaphor conclude that about one out of 5 words can be interpreted as metaphorical (Pragglejaz, 2007). How about pictures? When do we interpret visual elements in terms of metaphor? We hardly have any reliable identification procedure for visual metaphor.

Research shows that both simple and complex mappings are involved in the processing of metaphor. Simple mappings are based on attributes of target and source and can be phrased as predicates with one argument (e.g., *a camera lens and an eye have a round shape*). More complex mappings are based on similar relational structures in target and source domain, which can be expressed in multi-argument predicates (e.g., *a camera lens and an eye are able to register visual experiences*). Metaphor interpretation is a matter of mapping relational structures rather than individual attributes (Gentner, 1983; Gentner & Kurtz, 2005), but the perceptual presence of source and target domain may elicit more perceptual-attributive mappings in the visual condition than in the verbal condition. Furthermore, visual richness may result in higher similarity ratings, as well as in more direct comparisons between objects, and thus in a higher preference for comparison expressions (simile: *a camera lens is like an eye*) than in the verbal condition. So, although current theories

suggest that relational more than attributive features govern the interpretation of metaphor, it remains an empirical question whether this holds for the visual domain, as well.

In this study¹, we compare the metaphoric potential of objects/concepts in their verbal and visual form in three experimental tasks, borrowed and adapted from studies in which different linguistic manifestations of metaphor were compared, that is, constructions of *metaphor* (target X is source Y, *a camera lens is an eye*) and *simile* (target X is like source Y, *a camera lens is like an eye*) (Aisenman, 1999; Utsumi, 2007). We presented respondents with objects either in their verbal form (*Verbal* condition) or in their visual form (*Visual* condition), and asked them to give a similarity rating (task 1), as much similarities as possible (task 2), and an evaluation of the appropriateness of their use in a metaphor (*a soldier is a pawn*) and a simile expression (*a soldier is like a pawn*) (task 3).

Measuring the metaphoric potential of words and pictures

Materials

24 pairs were constructed of words and pictures, like *camera lens - eye*. The pictures were black and white line drawings (height: 489 pixels, width: 449 pixels). Proper identification of the pictures was established in a naming experiment with 30 undergraduate students at Tilburg University. This resulted in the deletion of two pairs that had a naming agreement of 50% or less. The same participants judged the 24 corresponding sentence pairs (*a camera lens is (like) an eye; an eye is (like) a camera lens*) on their naturalness. Four pairs were omitted because they did not obtain a preference of 60% or more for either one of the sentences. The resulting 18 pairs of pictures and the related pairs of words were used in the experiment in their preferred order (*camera - eye*).

Participants, instrumentation and procedure

113 students (81 female, average age 21, range 17-42) at Tilburg University took part in the experiment. They carried out three tasks in front of a computer screen, in each of which they were presented with 18 pairs of objects in random order. Object modality (visual vs. verbal) was a between subject factor. Participants were assigned randomly to the visual (n=56) or the verbal (n=57) condition. The participants in the visual condition started with the naming task described above, and were shown the correct word each time they gave a wrong name. In the similarity rating task, the participants had to manipulate a vertical slider in between the two objects: The more they judged the objects to be similar, the more they had to move slider up the scale. The starting position of the slider was halfway the scale. Apart from the 18 experimental pairs, there were 18 filler pairs as a control, 9 verbal and 9 visual. In the feature production task, the participants had to list as many correspondences between the two objects as they could think of. Finally, in the sentence judgment task, the participants were asked to give their preference for one version of the sentence over the other by sliding a horizontal slider toward the version of their preference (metaphor or simile). Initially, the slider was in the middle position. The left-right order of the objects (task 1 and 2: target-source; source-target) and the sentence versions (task 3: simile-metaphor; metaphor-simile) was counterbalanced.

¹ We thank Stijn Jansen for helping us with constructing the materials, carrying out the experiment, and analyzing the data.

Data analysis and results

The slider scores in tasks 1 and 3 ranged on a scale from 0 to 100. Features in task 2 were coded as either perceptual or conceptual (entailing mostly relational characteristics). The results of the similarity rating task were analysed in an analysis of variance with modality as a between participants variable. See Table 1 for the corresponding means.

Participants rated the experimental pairs as more similar than the control pairs ($F(1,214) = 343,80$; $MSE = 155,882$; $p < .001$; $\eta^2 = ,61$) and visual pairs as more similar than verbal pairs ($F(1,107) = 8,39$; $MSE = 186,497$; $p < .01$; $\eta^2 = ,07$). Feature production showed an effect of modality as well: Visual pairs elicited more perceptual features than verbal pairs ($F(1,107) = 8,00$; $MSE = 0,015$; $p < .01$; $\eta^2 = ,07$), but unexpectedly also more conceptual features ($F(1,107) = 16,92$; $MSE = 0,121$; $p < .001$; $\eta^2 = ,14$). There were no preferences for simile or metaphor sentence versions ($F(1,107) < 1$).

Table 1: Mean similarity rating (range 0 – 100), mean number of perceptual and conceptual features, interpretative diversity score, and simile (0) – metaphor (100) score as a function of modality (visual-verbal). Standard deviations between brackets.

	visual	verbal	control
Similarity rating	56.65 (14.03)	48.98 (13.28)	21.41 (1.20)
Perceptual features	0.20 (0.15)	0.13 (0.08)	
Conceptual features	1.47 (0.38)	1.19 (0.31)	
Simile-metaphor preference	34.86 (9.35)	35.30 (10.12)	

Conclusions and Discussion

The results suggest that pictures are at least as suited to trigger metaphoric conceptualization as words. A similar suggestion can be found by a simple web search. Ask Google to find all co-occurrences of *bird* and *airplane* (3,21 million hits). Observe how difficult it is to find real cases of metaphor (stop after a few hundreds of hits). Ask the same again for images only (1,49 million hits), and notice that the first 20 hits contain a large variety of non-literal combinations of the two objects, like fused bird-airplane images and technical drawings showing similarities of bird and airplane wings. Not really conclusive, but at least suggestive evidence for the same conclusion that metaphoric (or, more broadly, associative) relations being at least as productive in pictures as they are in language

One factor that will be controlled in a follow-up experiment is the perceptual similarity between the two objects, as real life visual metaphors (for example in the genre of advertising) often exploit perceptual similarity between objects in an attempt to suggest metaphoric links between different concepts (Schilperoord, Maes, & Ferdinandusse, 2009).

References

- Aisenman, R. A. (1999). Structure-mapping and the simile-metaphor preference. *Metaphor and symbol*, 14(1), 45-51.
- Bowdle, B. F., & Gentner, D. (2005). The Career of Metaphor. *Psychological review*, 112(1), 193-215.
- Gentner, D. (1983). Structure-mapping: A theoretical framework for analogy. *Cognitive Science*, 7(2), 155-170.
- Gentner, D., & Kurtz, K. J. (2005). Relational categories. In W. K. Ahn, R. L. Goldstone, B. C. Love, A. B. Markman & P. W. Wolff (Eds.), *Categorization inside and outside the lab* (pp. 151-175). Washington DC: APA.
- Kress, G. R., & Van Leeuwen, T. (2006). *Reading images: the grammar of visual design*. London, New York: Routledge.
- Lakoff, G., & Johnson, M. (1980). *Metaphors we Live by*. Chicago [etc.]: University of Chicago Press.
- Pragglejaz. (2007). MIP: A method for identifying metaphorically used words in discourse. *Metaphor and symbol*, 22(1), 1-40.

- Schilperoord, J., Maes, A., & Ferdinandusse, H. (2009). Perceptual and conceptual visual rhetoric. The case of symmetric object alignment. *Metaphor and Symbol, 24*, 155-173.
- Utsumi, A. (2007). Interpretive Diversity Explains Metaphor-Simile Distinction. *Metaphor and symbol: a quarterly journal, 22*(4), 291-312.
- Zhong, C.-B., & Liljenquist, K. (2006). Washing away your sins: Threatened morality and physical cleansing. *Science, 313*(5792), 1451-1452.