

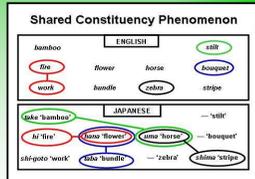
Morphology and Picture Relatedness

Koji Miwa, Sally Rice, & Gary Libben - University of Alberta

Background

Different languages use different words to express the same concept and thus have different shared constituency patterns.

e.g.
fireworks (English)
hanabi 'flower-fire' (Japanese)
yàn huǒ 'flame-fire' (Mandarin Chinese)



Baayen & Boroditsky (in press) revealed that morphological structural relatedness in Dutch (e.g. vrachtwagen & kindervagen) influenced Dutch speakers' perception and conceptualization of reality by means of picture comparison tasks.

The Linguistic Relativity Hypothesis (LRH), which holds that the languages people are normally exposed to influence their cognition of reality, has motivated several lines of research in psychology and linguistics, but the truth is not clear, due to methodological limitations (Lucy, 1997).

Morphology, especially compound representations in the mental lexicon has motivated intensive psycholinguistics research for the last 30 years.

Research Scheme

Research Question:

Does structural relatedness in morphology leads to perceptual similarity (picture relatedness) ?

Hypothesis 1:

There is morphological effect on picture relatedness.

YES consistent with Baayen & Boroditsky (in press)

Hypothesis 2:

Carrying more meaning, head constituents have more influence on picture relatedness than modifier constituents.

NO

Hypothesis 2:

The degree of word activations in the mind influences the picture relatedness ratings.

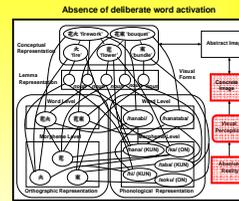
Experiment 1 Picture Comparison

Aim

To test the cross-language applicability of picture comparison tasks

Stimuli

- 20 pairs of pictures share a left constituent in Japanese translation equivalents, but not in English.
- 20 pairs of pictures share a right constituent in Japanese translation equivalents, but not in English.
- 20 pairs of control pictures were unrelated.



Participants

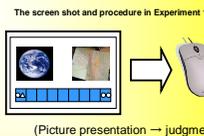
- 20 native speakers of Japanese
- 20 native speakers of English

Procedure

- Pairs of pictures were presented on a computer screen simultaneously by the PsyScope.
- The participants were told to judge the similarity between the two presented pictures and click an appropriate point on a 9-point scale.

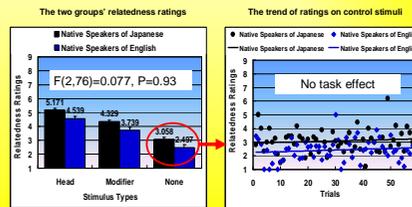
Three Types of Stimuli used

Shared Position	Key Morpheme	Word Pair	Morphological Structure	Literal Meaning	Translation Equivalent
Modifier	花 hana 'flower'	花火 hanabi / 花束 hanataba	hanabi / hanataba	flower-fire / flower-bundle	firework / bouquet
Head	魚 gyo 'fish'	金鱼 kingyo / 人鱼 ningyo	kingyo / ningyo	gold-fish / person-fish	gold fish / mermaid
None	∅	灰皿 haizara / 浮輪 ukwa	haizara / ukwa	ash-tray / float-ring	ashtray / life preserver



Results and Discussion

- Japanese speakers rated higher on target stimuli but also showed higher ratings on control stimuli.
- Difference on control stimuli could be attributed to inherent cultural difference, rather than task effects.
- The two groups showed identical rating patterns (p=0.93).



Experiment 2 Picture Comparison & Naming

Aim

To test if word activations in the mind influence picture comparison.

Stimuli

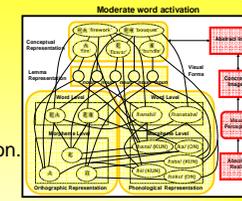
- The same as in Experiment 1

Participants

- 20 native speakers of Japanese
- 20 native speakers of English who did not participate in Experiment 1

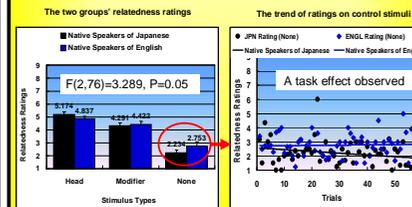
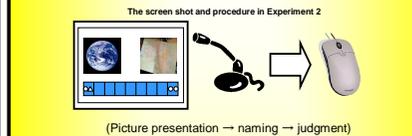
Procedure

- The same as in Experiment 1, except that participants named pictures before making picture relatedness judgments



Results

- The two groups' rating pattern became different (P < 0.05).



Experiment 3 Word Image Comparison

Aim

To test how maximum word activations in the mind influence picture comparison.

Stimuli

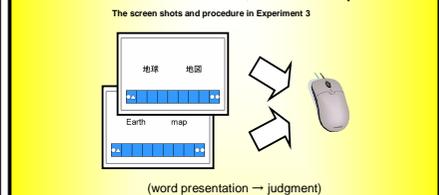
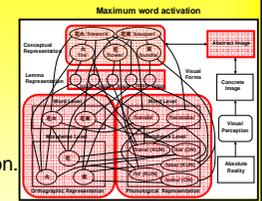
- The Japanese and English translated word equivalents of the picture stimuli used in Experiment 1 and Experiment 2

Participants

- The same as in Experiment 2

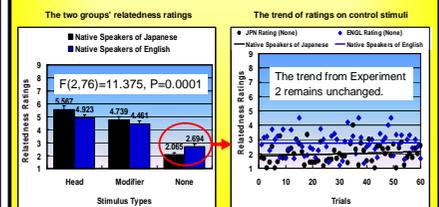
Procedure

- The same as in Experiment 1, except that word stimuli were used, instead of pictures



Results

- The two groups' rating pattern became significantly different (P < 0.0001).



General Discussion

- Contrary to Baayen and Boroditsky (in press) study, shared constituency phenomenon did not influence the target group's picture relatedness ratings significantly in the picture comparison paradigm.
- Picture Perception does not lead to automatic word activations in the mental lexicon (or very weak activation).
- Picture comparison could influence language performance (Ikeda, 1994), but not vice versa.
- Influence of language on picture relatedness is conditional
- Influence of shared constituency on picture relatedness ratings are positively correlated with the degree of word activation in the mind.

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