

# Priming the Interpretation of Noun Compounds: Evidence against Relation-based Models

**Claudine Raffray (C.N.Raffray@sms.ed.ac.uk)**

Psychology, School of Psychology, Philosophy and Language Sciences, University of Edinburgh  
7 George Square, Edinburgh, EH8 9JZ UK

**Martin Pickering (Martin.Pickering@ed.ac.uk)**

Psychology, School of Psychology, Philosophy and Language Sciences, University of Edinburgh  
7 George Square, Edinburgh, EH8 9JZ UK

**Holly Branigan (Holly.Branigan@ed.ac.uk)**

Psychology, School of Psychology, Philosophy and Language Sciences, University of Edinburgh  
7 George Square, Edinburgh, EH8 9JZ UK

## Introduction

Interpreting relations between constituent parts is a core element of language comprehension. From the perspective of research on concepts, conceptual combination provides rich evidence for this, with everyday examples ranging from well-established noun compounds such as *computer chip* to relatively temporary novel combinations such as *castle tourist*; as listeners we are able to interpret combined concepts from all points along this continuum with ease.

## Theoretical Background

Two theoretical models dominate the recent relevant literature. The most striking difference between the two approaches concerns the roles of head noun and modifier in online processing. Schema-based approaches (e.g. Murphy, 1990; Smith et al., 1988, Wisniewski, 1996) hold that combined concepts are interpreted by modifying the dimensions or attributes in the representation of the head noun. Gagné & Shoben (1997; Gagné, 2001) propose an alternative relation-based model known as the competition-among-relations-in-nominals (CARIN) theory, according to which conceptual combination involves assigning a thematic relation between the head noun and its modifier; this relational information is stored with the modifier concept.

## Experiments

We report two experiments that examined the effects of semantic priming on the interpretation of ambiguous noun-noun compounds to investigate whether modifier concepts are associated with relational information as the CARIN model proposed. Using a picture verification (forced choice) paradigm, participants were presented with depictions of ambiguous novel combinations such as *frog hat* (where the possible interpretations were restricted by the picture alternatives to 'a frog wearing a hat' and 'a hat with pictures of frogs on it'). The primes in the first experiment were in four conditions (1a-d), crossing lexical overlap (N1- versus

N2-repeated) with semantic relation (POSSESSOR versus DESCRIPTIVE).

## Results and Discussion

Results showed a reliable main effect of semantic relation: Relation priming occurred regardless of whether N1 or N2 was repeated between prime and target;  $p < .01$ . This goes against the prediction made by the CARIN model, according to which relation availability is uniquely associated with the modifier (N1) and therefore unaffected by the head noun (Gagné & Shoben, 1997; Gagné, 2001). A second experiment investigated the effect of a zero-lexical-overlap condition. Results showed a significant priming effect even without repetition of either noun;  $p < .05$ . Our results therefore argue against the CARIN model, but are compatible with schema-based theories of conceptual combination.

- 1a. *frog*<sub>[POSS]</sub> *boat*
- 1b. *frog*<sub>[DES]</sub> *boat*
- 1c. *baby*<sub>[POSS]</sub> *hat*
- 1d. *baby*<sub>[DES]</sub> *hat*

## References

- Gagné, C.L. & Shoben, E.J. (1997). Influence of thematic relations on the comprehension of modifier-noun combinations. *Journal of Experimental Psychology: Learning, Memory and Cognition*, 23, 71-87.
- Gagné, C.L. (2001). Relation and lexical priming during the interpretation of noun-noun combinations. *Journal of Experimental Psychology: Learning, Memory and Cognition*, 27, 236-254.
- Murphy, G.L. (1988). Comprehending complex concepts. *Cognitive Science*, 12, 529-562.
- Smith, E.E., Osherson, D.N., Rips, L.J. & Keane, M. (1988). Combining prototypes: A selective modification model. *Cognitive Science*, 12, 485-527.
- Wisniewski, E.J. (1996). Construal and similarity in conceptual combination. *Journal of Memory and Language*, 35, 434-453.