Three kinds of metaphor-in-language and how we can use them to synthesize theories of metaphor

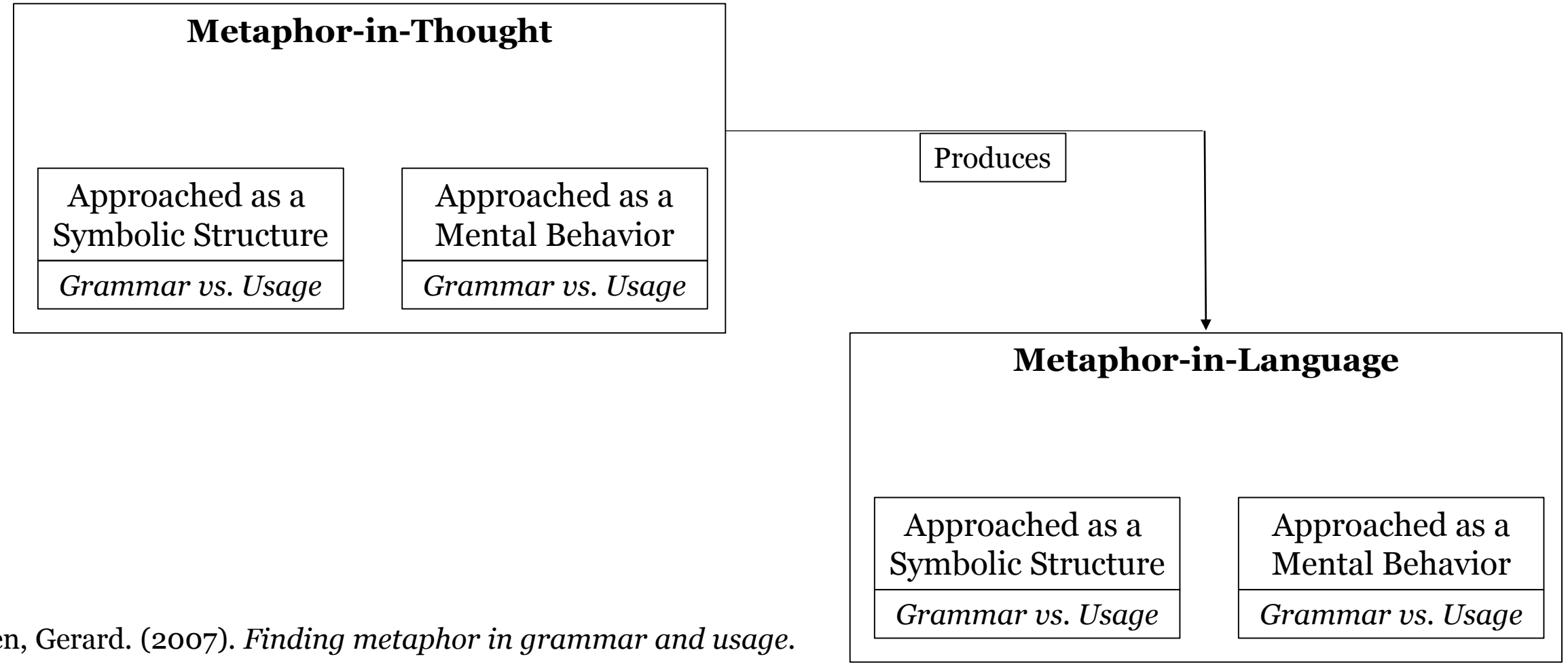
Jonathan Dunn

PURDUE
UNIVERSITY

Outline

1. **Rationale [15 minutes remaining]**
2. Three kinds of metaphor-in-language
3. Meta-study: Focus of theories of metaphor
4. Insights from computational modelling
5. Synthesizing theories of metaphor-in-thought

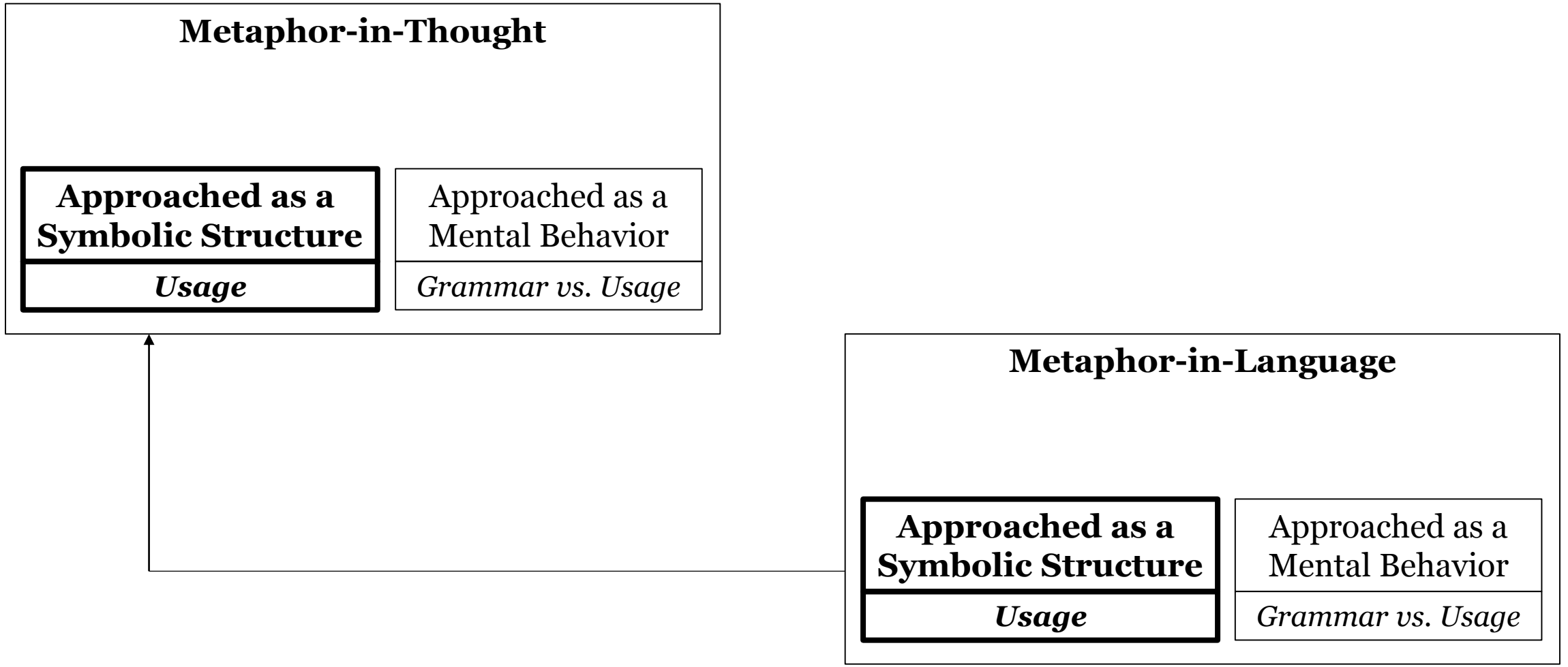
Aspects of Metaphor



Steen, Gerard. (2007). *Finding metaphor in grammar and usage.*

Purpose

Using Metaphor-in-Language
to limit the scope of theories about
Metaphor-in-Thought



The Problem

Many metaphoric utterances are left untouched by theories of metaphor-in-thought.

Note About Premises

"The crucial question for cognitive linguistics … is whether the cognitive-linguistic definition of metaphor as thought, that is, metaphor as always involving a mapping between two conceptual domains, can now be maintained."

Steen, Gerard. (2011). "Issues in collecting converging evidence: Is metaphor always a matter of thought?" In *Converging Evidence: Methodological and theoretical issues for linguistic research,* p. 42.

Note About Premises

Premise adopted here:

Some, but not all, instances of metaphor-in-language involve a mapping between two conceptual domains.

Thus, not all metaphoric utterances necessarily have a source and a target.

Outline

1. Rationale

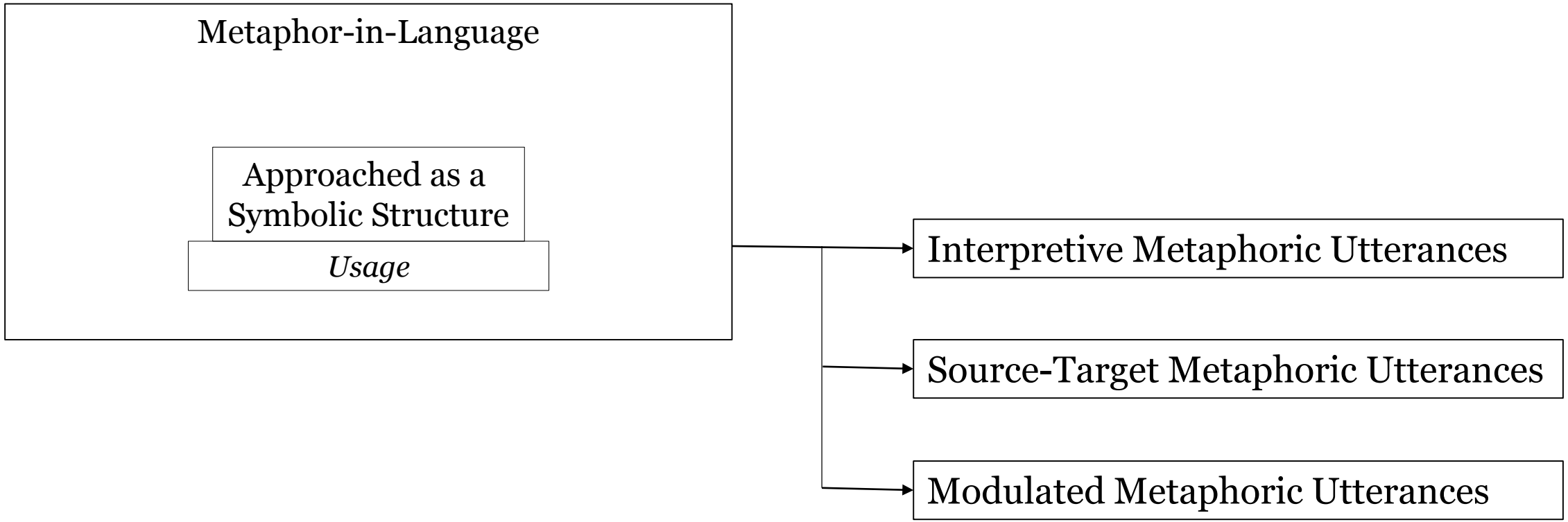
2. Three kinds of metaphor-in-language
[13 minutes remaining]

3. Meta-study: Focus of theories of metaphor

4. Insights from computational modelling

5. Synthesizing theories of metaphor-in-thought

Three Kinds of Metaphor-in-Language



Important Properties Metaphoric Utterances

(1) Does the utterance have a contextually stable interpretation?*

(2) Does the utterance contain (or reflect) a source-target mapping?

* cf. Dunn, Jonathan. (2013a). “How linguistic structure influences and helps to predict metaphoric meaning.” *Cognitive Linguistics,* 24(1): 33-66.

Types of Metaphoric Utterances

Type	Interpretations	Source-Target	Best Model
Interpretive	Unstable	No	Semantic Similarity
Source-Target	Stable	Yes	Source-Target Mapping
Modulated	Stable	No	Domain Interactions

Examples: Interpretive (1)

(1) But there is a puff of dust on the horizon.

(2) The female soil was possessed and misused by the masculine force of the Spanish invaders.

(3) I'll give it some paint.

Note: All examples are taken from VU Amsterdam Metaphor Corpus.

Examples: Interpretive (2)

(4) That girl is a dog.

(5) Visitors will have to look at these mechanical millipedes for years to come.

(6) The stains on the carpet have survived every name change.

Examples: Source-Target (1)

(7) In general our policy should be to proceed with building our state block by block.

(8) His long-term ambition to rule a large south Slav kingdom finally collapsed.

(9) These influences laid the foundations for his blend of the naive and the sophisticated.

Examples: Source-Target (2)

(10) The cost has gone through the barn roof.

(11) Now that would be a great leap forward.

(12) You can be miles ahead in the polls but when you get to the last three weeks things change.

Examples: Modulated (1)

(13) There are few things worse than being bludgeoned into reading a book you hate.

(14) An Arsenal team in peak health would have kept a grip on the match.

(15) She took out a handkerchief and mopped her eyes.

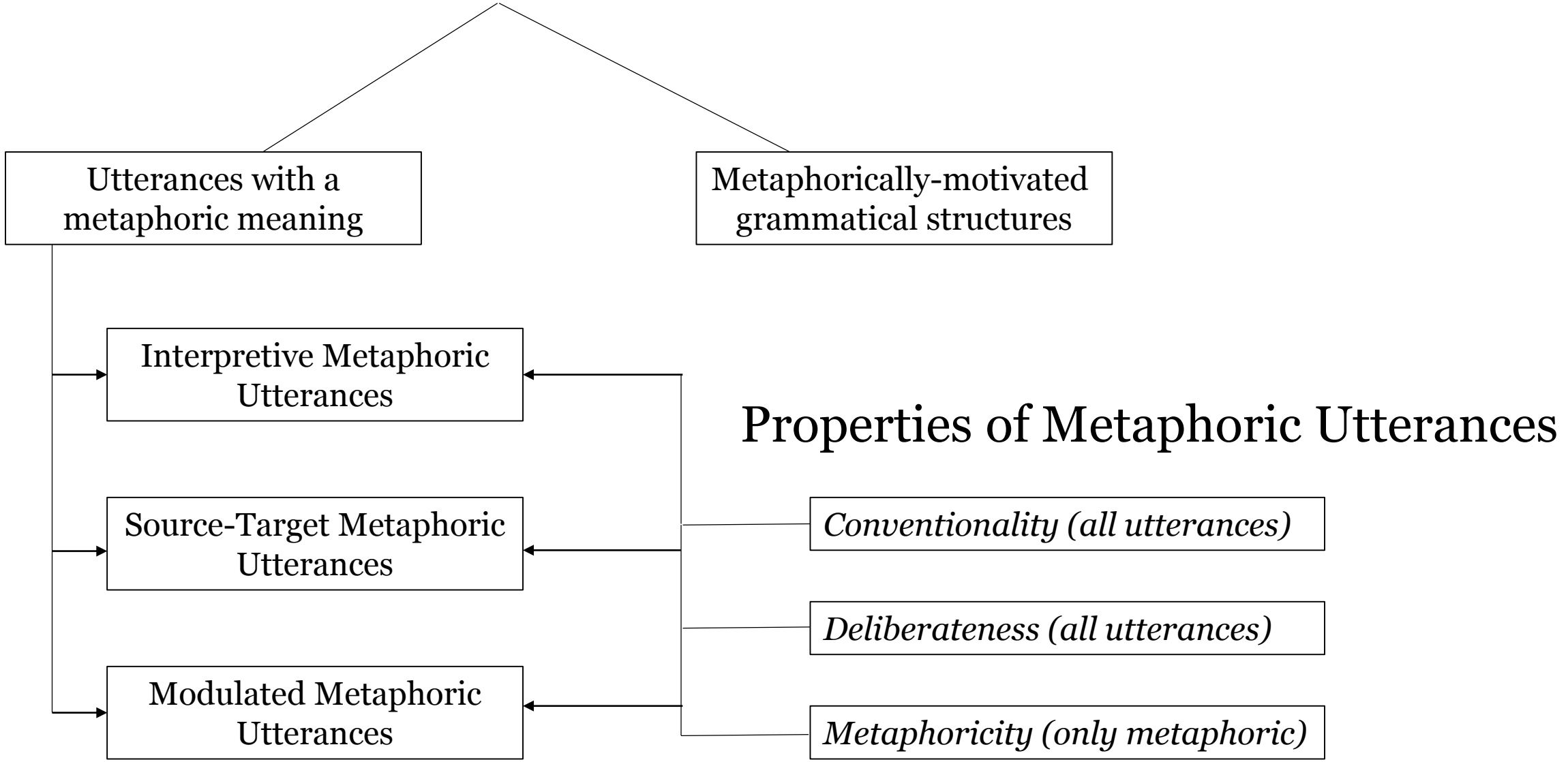
Examples: Modulated (2)

(16) His final task was to weed out of the calendar all the rowing courses made unfair by the wind.

(17) The police driver shot Jamie a look of enquiry.

(18) The few straggling trees struggled to keep their precarious hold in the uncompromising soil.

Overview of Metaphor-in-Language



Outline

1. Rationale
2. Three kinds of metaphor-in-language
3. **Meta-study: Focus of theories of metaphor [8 minutes remaining]**
4. Insights from computational modelling
5. Synthesizing theories of metaphor-in-thought

Meta-Study: What Kind of Examples?

- What types of metaphor-in-language are used as examples in different schools of metaphor research?

- What linguistic forms (e.g., A is B) do the examples take?

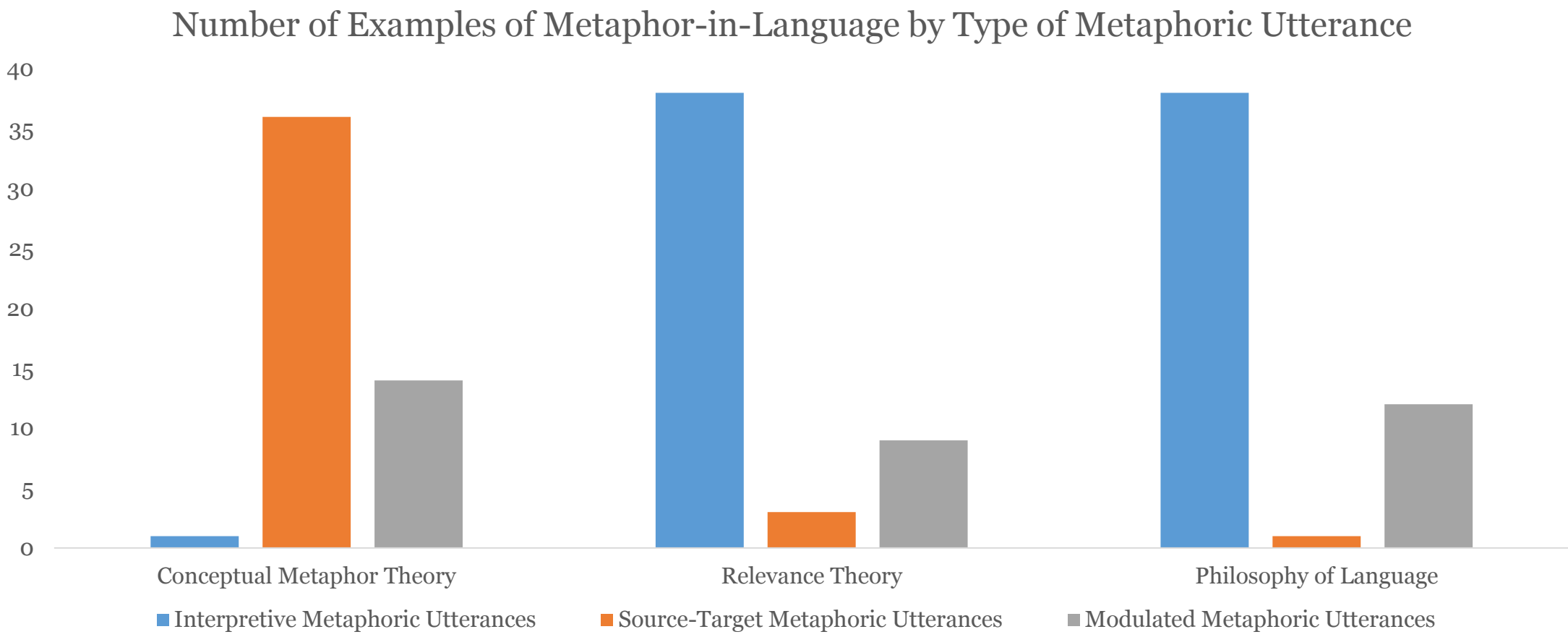
    - Conceptual Metaphor Theory
    - Relevance Theory
    - Philosophy of Language

Meta-Study: Methodology

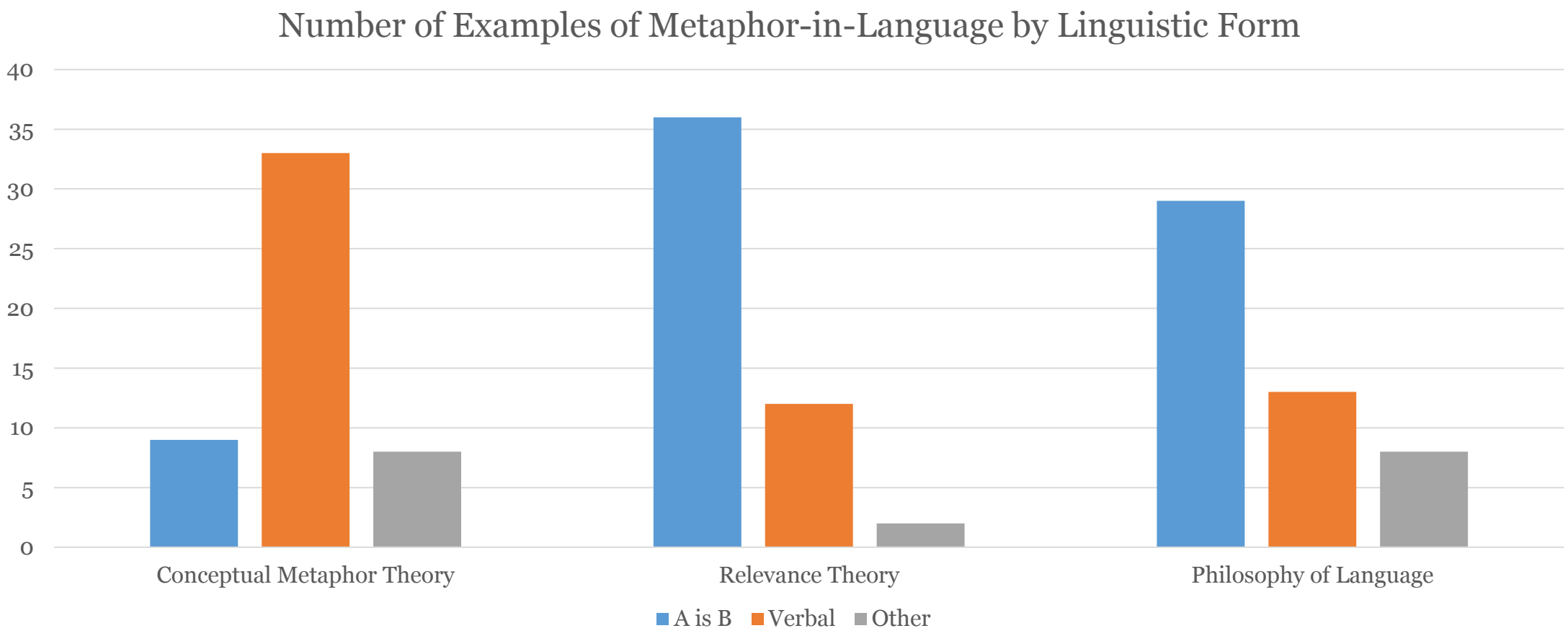
50 metaphoric utterances were taken from three different schools of metaphor research:

- Conceptual Metaphor Theory
  - *Metaphors We Live By* (Lakoff & Johnson, 1980)
- Relevance Theory
  - *Relevance: Communication and Cognition* (Sperber & Wilson, 1995)
  - (Wilson & Carston, 2006; Sperber & Wilson, 2008; Pilkington, 2000; Song, 1998)
- Philosophy of language
  - (Davidson, 1979; Searle, 1979; Martinich, 1984)

Meta-Study Results



Meta-Study Results



Meta-Study Conclusions

- Relevance Theory and Philosophy of Language use similar examples
- Little overlap between these two approaches and Conceptual Metaphor Theory
- Very different theories based on very different metaphoric utterances

Outline

1. Rationale
2. Three kinds of metaphor-in-language
3. Meta-study: Focus of theories of metaphor
4. **Insights from computational modelling [6 minutes remaining]**
5. Synthesizing theories of metaphor-in-thought

Models of Metaphor-in-Language

- Metaphor identification systems are computational models of metaphor-in-language
  - Given a symbolic representation of a linguistic utterance,
  - What are the properties or features of a linguistic utterance which characterize metaphor-in-language?

Metaphor Identification Systems

Four systems based on four different models of metaphor-in-language were evaluated on the VU Amsterdam Metaphor Corpus (Steen, et al. 2010)

(1) Semantic Similarity (Sporleder & Li, 2009; Li & Sporleder, 2010)

(2) Abstractness (Turney & Littmann, 2003; Turney, et al., 2011)

(3) Source-Target Mappings (Shutova, et al., 2010; Shutova, et al., 2013)

(4) Domain Interactions (Dunn, 2013b, 2013c)

The Systems

- Full coverage, non-toy systems which take natural language text as input
- All systems use computational annotations to produce features
- Evaluate features using machine learning algorithms

For technical details of the implementations, see:

Dunn, Jonathan. (2013b). “Evaluating the premises and results of four metaphor identification systems.” *CICLING 2013:* 471-486.

Dunn, Jonathan. (2013c). “What metaphor identification systems can tell us about metaphor-in-language.” *NAACL 2013: 1st Workshop of Metaphor in NLP*: 1-10.

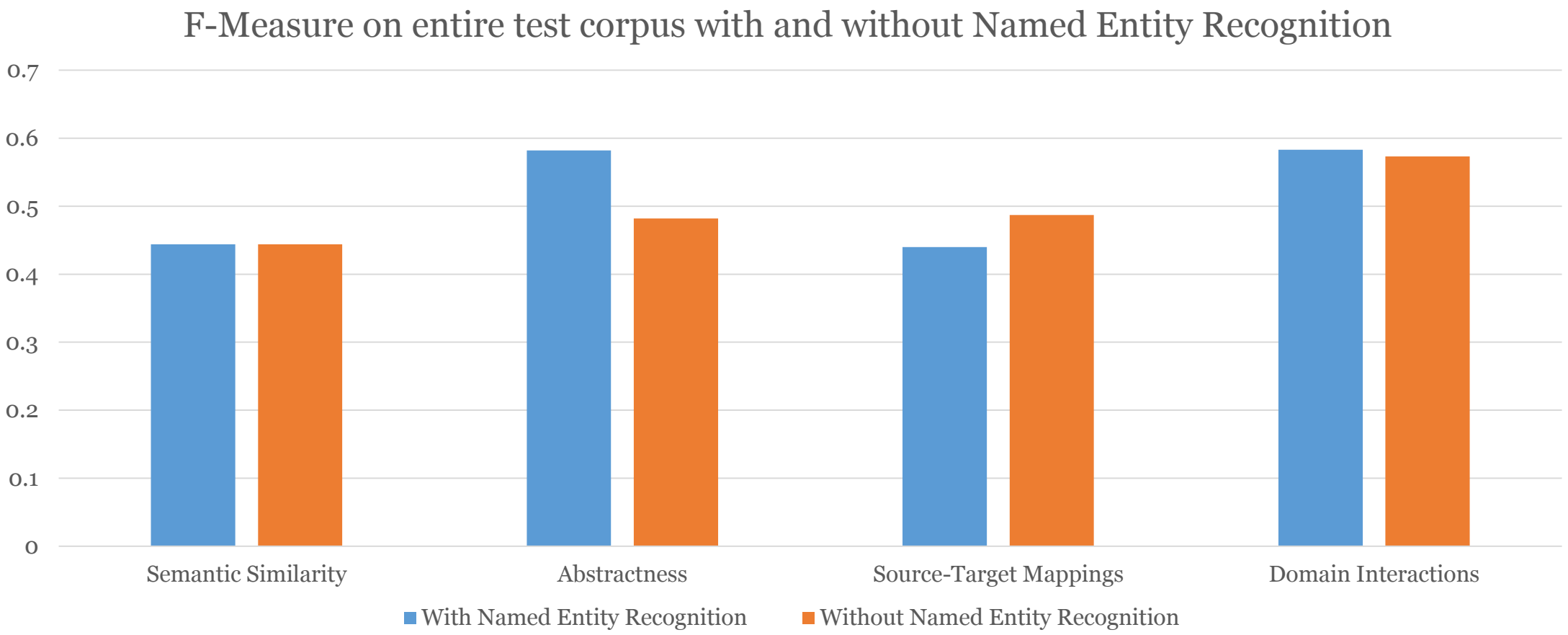
Justification

(1) Each of the systems is focused on a particular set of properties of metaphor-in-language

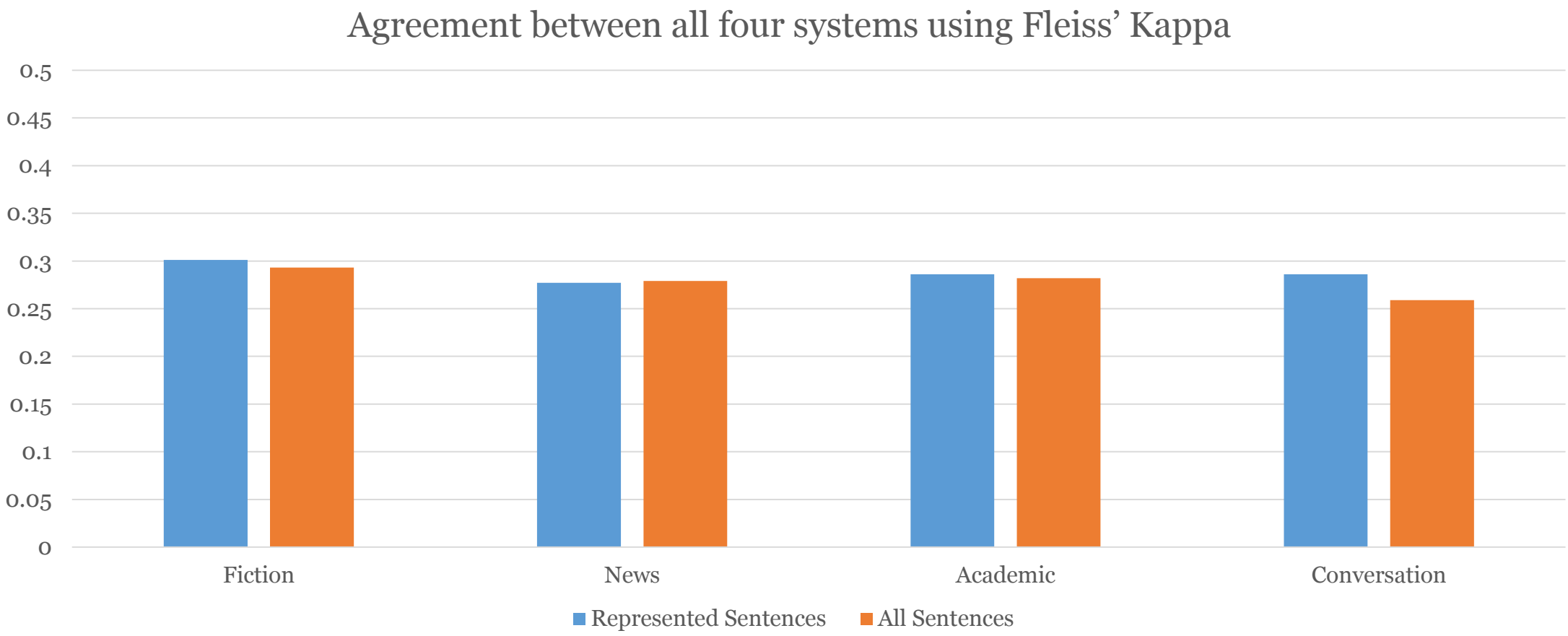
(2) The VU Amsterdam Metaphor Corpus annotates all instances of metaphor-in-language

Question: Do these systems find all of the annotated instances?

Overall Performance

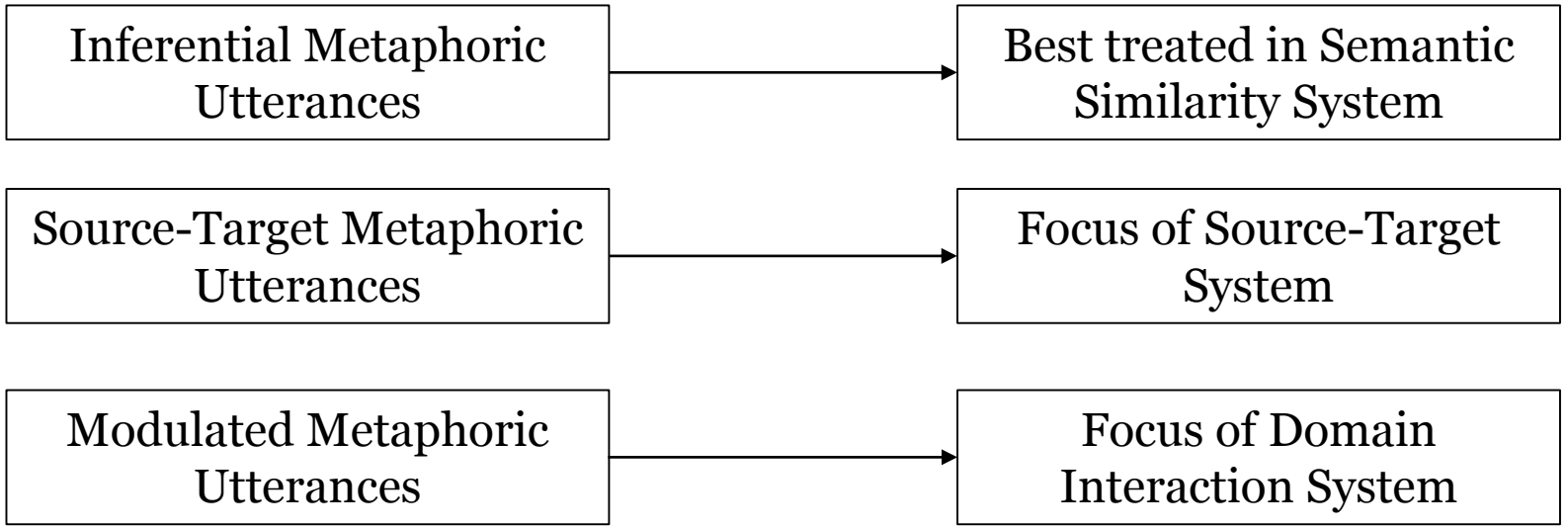


Low Agreement Between Systems



Conclusions

- The systems seem to be identifying distinctly different metaphoric utterances.



- But more works needs to be done to tailor the models to each type of metaphor-in-language and validate the results.

Outline

1. Rationale
2. Three kinds of metaphor-in-language
3. Meta-study: Focus of theories of metaphor
4. Insights from computational modelling
5. **Synthesizing theories of metaphor-in-thought**

[3 minutes remaining]

Limiting the scope of theories of metaphor

"Different perspectives often focus on some

kinds of metaphor and ignore others,

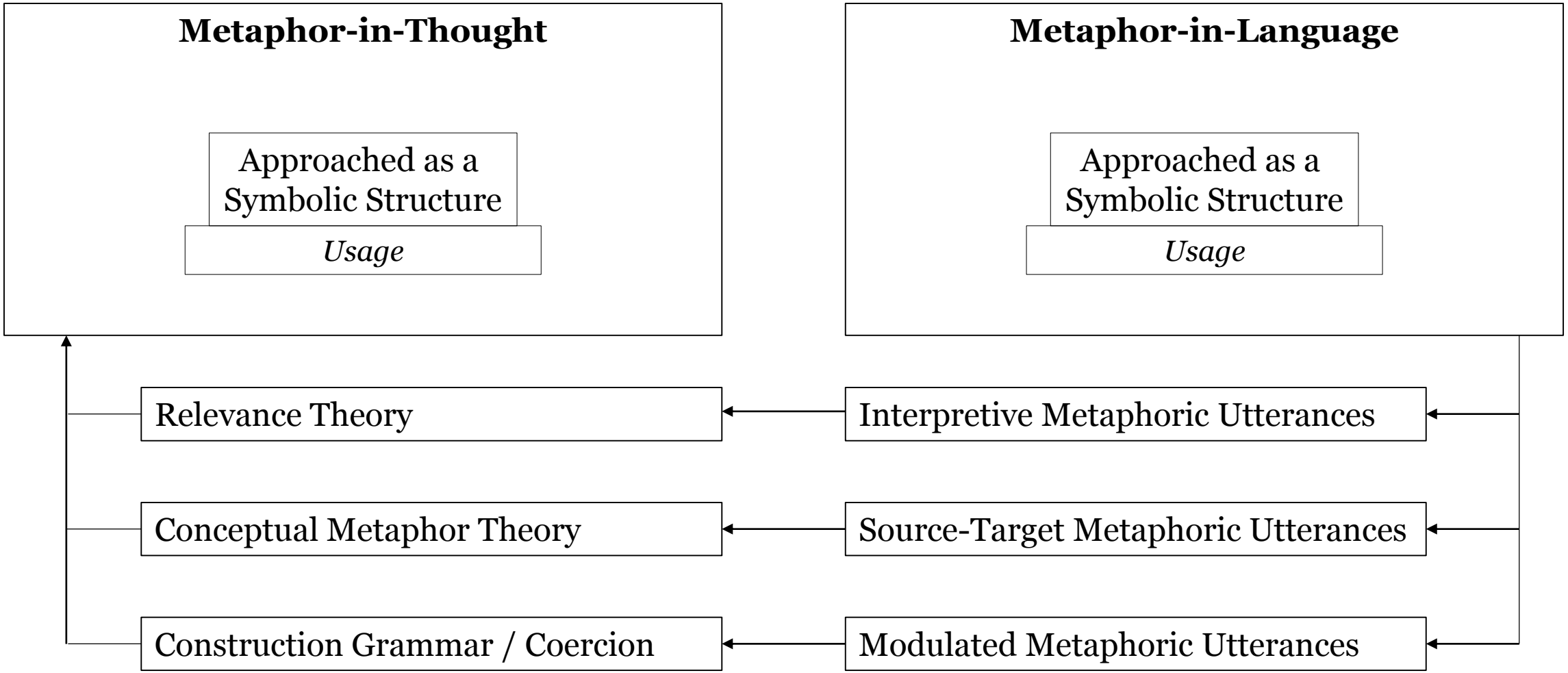
i.e. they only have a particular kind of metaphor

in mind and make generalized statements about

metaphor as a whole."

Tendahl, Markus. (2009). *A Hybrid Theory of Metaphor: Relevance Theory and Cognitive Linguistics*. *p*. 139

Limiting the scope of theories of metaphor



A Word of Caution

"We need to be careful to not assume that a listener…

hears a metaphorical utterance and then selects

a particular strategy (e.g., categorization)

in order to interpret it…"

Gibbs, Raymond & Colston, Herbert. (2012). *Interpreting Figurative Meaning*. p. 136-137

Response

Gibbs & Colston discuss metaphor as a mental behavior (136):

> "It is important not to confuse:
>
> **[1]** our consciously-held intuitions about metaphoric meaning, and
>
> **[2]** fast-acting cognitive processes that may give rise to those interpretations."

The focus here is on the properties of metaphor-in-language viewed as a symbolic representation.

Conclusions

(1) If we do not assume that all metaphoric utterances necessarily have a source-target mapping, then descriptive adequacy of metaphor-in-language improves.

(2) Existing theories of metaphor-in-thought are based on a sub-set of metaphoric utterances, using some and ignoring others.

(3) The proposed distinction between Interpretive, Source-Target, and Modulated metaphoric utterances, suggested by computational models of metaphor-in-language, can help to improve descriptive adequacy.

Thank you

Questions?

References

Dunn. (2013a). “How linguistic structure influences and helps to predict metaphoric meaning.” *Cognitive Linguistics,* 24(1): 33-66.

Dunn. (2013b). “Evaluating the premises and results of four metaphor identification systems.” *CICLING 2013:* 471-486.

Dunn. (2013c). “What metaphor identification systems can tell us about metaphor-in-language.” *NAACL 2013: 1st Workshop of Metaphor in NLP*: 1-10.

Gibbs & Colston. (2012). *Interpreting figurative meaning*. Cambridge University Press.

Steen (2007). *Finding metaphor in grammar and usage*. John Benjamins.

Steen. (2011). “Issues in collecting converging evidence: Is metaphor always a matter of thought?” In *Converging Evidence: Methodological and theoretical issues for linguistic research.*

Steen, et al. (2010). “Metaphor in usage.” *Cognitive Linguistics,* 21(4): 765-796.

Tendahl. (2009). *A Hybrid Theory of Metaphor: Relevance Theory and Cognitive Linguistics*. Palgrave Macmillan.