Syntax & Semantics WiSe 2022/2023
Lecture 19: Lexical Semantics (Word Meaning)

19/01/2023, Christian Bentz

Overview

Recap of Lecture 18

Lexical Semantics (Word Meaning)
    Ambiguity
    Ambiguity: A Different Perspective
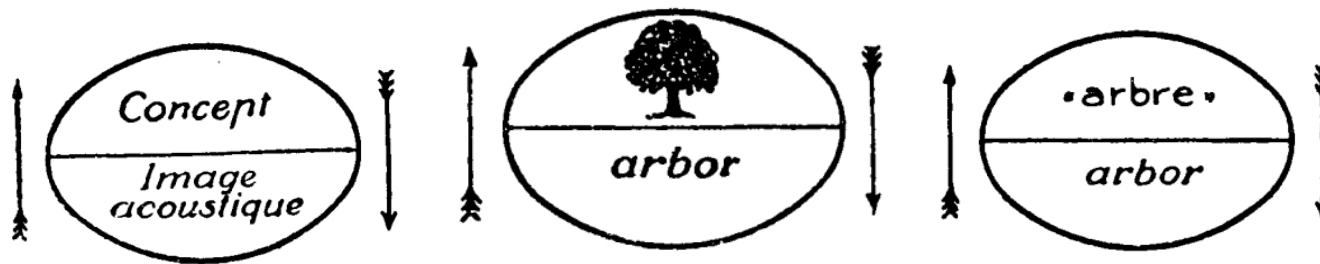   Indeterminacy
    Vagueness

Summary

References

Recap of Lecture 18

Form and Meaning: The Roots

"Signifié et signifiant" at three levels:

Level 1: Abstract Relation

Level 2: Concrete Mapping (Denotation)

Level 3: Metalanguage (Translation)

Saussure (1995). Cours de linguistique générale, p. 99.

Core Concept: **Arbitrariness**

"For most words, the relation between the form (i.e. phonetic shape) of the word and its meaning is **arbitrary**. This is not always the case. Onomatopoetic words are words whose forms are intended to be imitations of the sounds which they refer to."
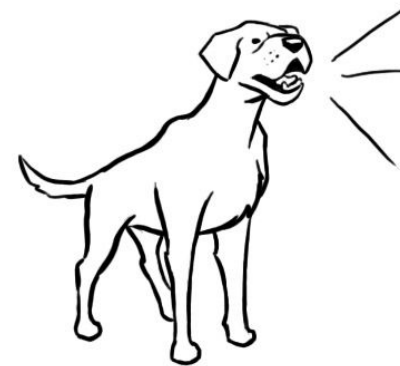
Kroeger (2019). Analyzing meaning, p. 6.

Arbitrary:

dog (English)
shun (Armenian)
cicing (Balinese)
gae (Korean)
aso (Tagalog)
etc.

Onomatopoetic:

bow-wow (English)
haf-haf (Armenian)
kong-kong (Balinese)
mung-mung or
wang-wang (Korean)
etc.

© 2012 Universität Tübingen
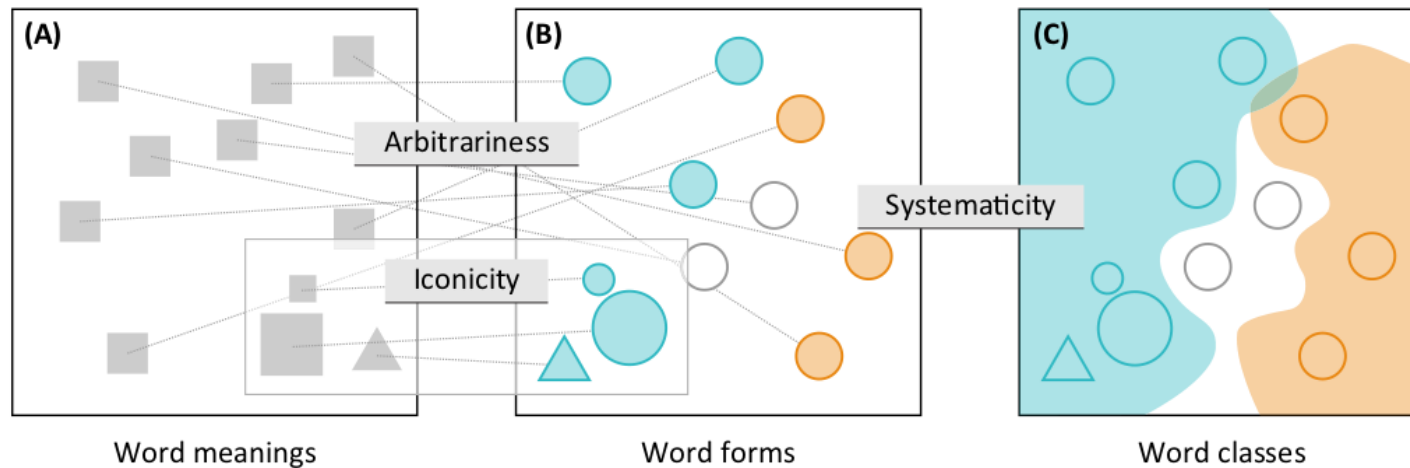
However: Iconicity and Systematicity

(A) Word meanings (B) Word forms (C) Word classes

Arbitrariness · Iconicity · Systematicity

"Figure 1. (A,B) Words show **arbitrariness** when there are conventional associations between word forms and meanings. Words show **iconicity** when there are perceptuomotor analogies between forms and meanings, here indicated by shape, size, and proximity (inset). (B,C) Words show **systematicity** when statistical regularities in phonological form, here indicated by color, serve as cues to abstract categories such as word classes. For example, blue and orange might correspond to cues indicative of English nouns and verbs."

Dingemanse, Blasi, Lupyan, Christiansen, & Monaghan (2015). Arbitrariness, iconicity, and systematicity in language.

Core Concept: **Compositionality**

Two words might be productively combined to yield a new, predictable meaning. *Compositionality* is a hallmark of human language (and other communication systems) as it enables the *infinite use of finite means*.

Amharic (amh, Afro-Asiatic)

(1) **zaf**   **tələq'** näw[1]
     tree.NOM.SG **big**   be.N.3SG
     [NOUN ADJ VERB]
     "The tree is big."
     $big'(tree')$[2]

---

[1] Amharic is normally written in Ge'ez script. This is a transliteration into Latin script based on Leslau (1995).

[2] This is the notation in Müller (2019). The notation in Kroeger (2019) for this example would be BIG(t) – this notation will be used in the semantics part of this course.

However: Idioms

(2) Kim ha-t   de-n   Wald vor   lauter
     kim have-PRS.3SG ART-ACC.SG forest because.of all.the
     Bäum-en   nicht ge-seh-en
     tree\-DAT.PL not   PTCP-see-PTCP
     literal translation: "Kim hasn't seen the forest because of all the
     trees."
     actual meaning: Kim was so concerned with the details that s/he
     didn't see the overall picture.

In the case of idioms (e.g. *kicking the bucket*), the intended
meaning of the sentence is not a *linear combinatorial*
derivation of its parts. Rather, a complex meaning is
assigned to the whole phrase.

Three "levels" of meaning

1. **Word meaning**: Meaning assigned to individual words.

   Example: kick; bucket

2. **Sentence meaning**: Meaning derived via combination of word meanings (compositional). "The term **sentence meaning** refers to the semantic content of the sentence: the meaning which derives from the words themselves, regardless of context."

   Example: KICK(j,b), literally "John kicks the bucket."

3. **Utterance meaning** ("speaker" meaning): "The term **utterance meaning** refers to the semantic content plus any pragmatic meaning created by the specific way in which the sentence gets used." Another definition is: "The totality of what the speaker intends to convey by making an utterance."

   Example: *John passes away*.

Kroeger (2019). Analyzing meaning, p.5.

© 2012 Universität Tübingen

Semiotic Triangle (Triangle of Reference/Meaning)

"**Semiotics** is the study of the relationship between **signs and their meanings**. In this book we are interested in the relationship between forms and meanings in certain kinds of symbolic systems, namely human languages. The diagram is a way of illustrating how speakers use language to describe things, events, and situations in the world."
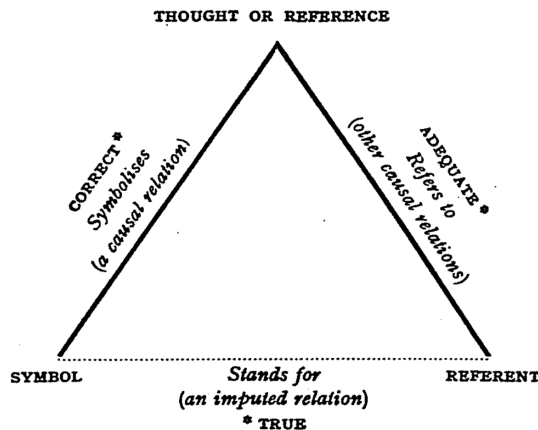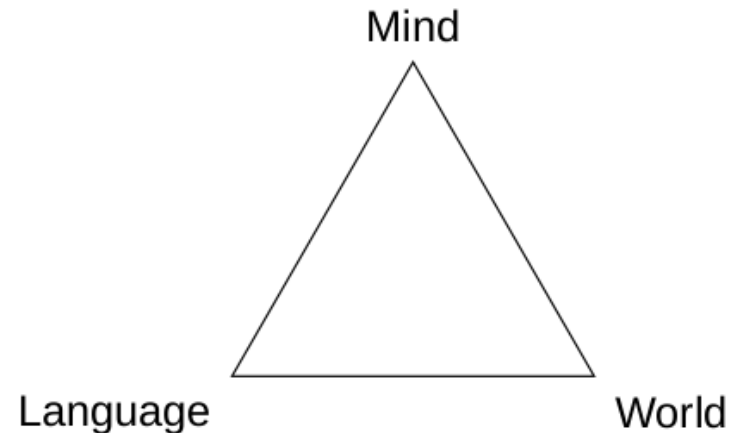
Kroeger (2019). Analyzing meaning, p. 16.

Ogden & Richards (1923). The meaning of meaning, p. 11.

Kroeger (2019). Analyzing meaning, p. 16.

© 2012 Universität Tübingen

Denotational vs. Cognitive Semantics

"The basic approach we adopt in this book focuses on the link between linguistic expressions and the world. This approach is often referred to as **denotational semantics** [...] An important alternative approach, **cognitive semantics**, focuses on the link between linguistic expressions and mental representations."
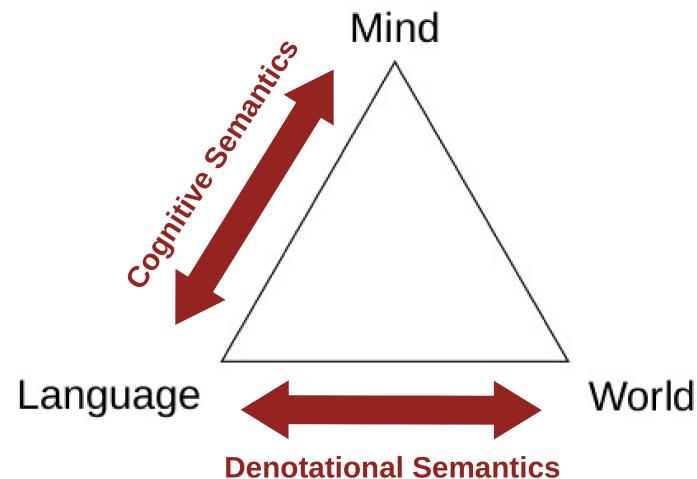
Kroeger (2019). Analyzing meaning, p. 17.

© 2012 Universität Tübingen

Denotational Semantics:
Types of Referring Expressions

"A **referring expression** is an expression (normally some kind of noun phrase) which a speaker uses to refer to something. The identity of the referent is determined in different ways for different kinds of referring expressions."

- Proper names (*Mao Zedong*)
- "Natural kind" terms (*the octopus*, *humans*, *methane*)
- Deictic elements (indexicals: *you*, *here*, *now*)
- Anaphoric elements (*George$_i$ ... he$_i$ ...*)
- Definite descriptions (*this book*, *the sixteenth president*)
- Indefinite descriptions (*a cowboy*)

Kroeger (2019). Analyzing meaning, p. 18.

Lexical Semantics (Word Meaning)

Three "levels" of meaning

1. **Word meaning**: Meaning assigned to individual words.

2. **Sentence meaning**: Meaning derived via combination of word meanings (compositional).

3. **Utterance meaning** ("speaker" meaning): "The term **utterance meaning** refers to the semantic content plus any pragmatic meaning created by the specific way in which the sentence gets used."

Kroeger (2019). Analyzing meaning, p.5.
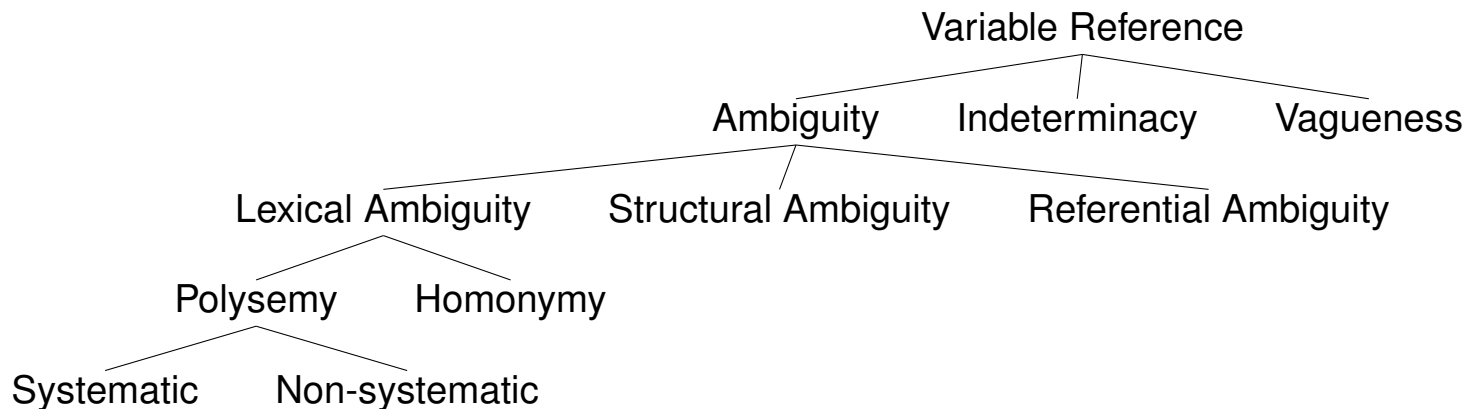
Variable Reference

Even if we assume that reference between forms and meanings is generally possible (i.e. denotational semantics), then there is still the problem of **variable reference**, i.e. *ambiguity*, *indeterminacy* and *vagueness*.

Variable Reference
- Ambiguity
  - Lexical Ambiguity
    - Polysemy
      - Systematic
      - Non-systematic
    - Homonymy
  - Structural Ambiguity
  - Referential Ambiguity
- Indeterminacy
- Vagueness

Ambiguity

Lexical Ambiguity

"It is possible for a single word to have more than one sense. [...] Words that have two or more senses are said to be **ambiguous** (more precisely, **polysemous** [...])."
Kroeger (2019). Analyzing meaning, p. 23

(3) A boiled egg is hard to *beat*.

(4) The farmer allows walkers to cross the field for free, but the bull *charges*.

beat, verb
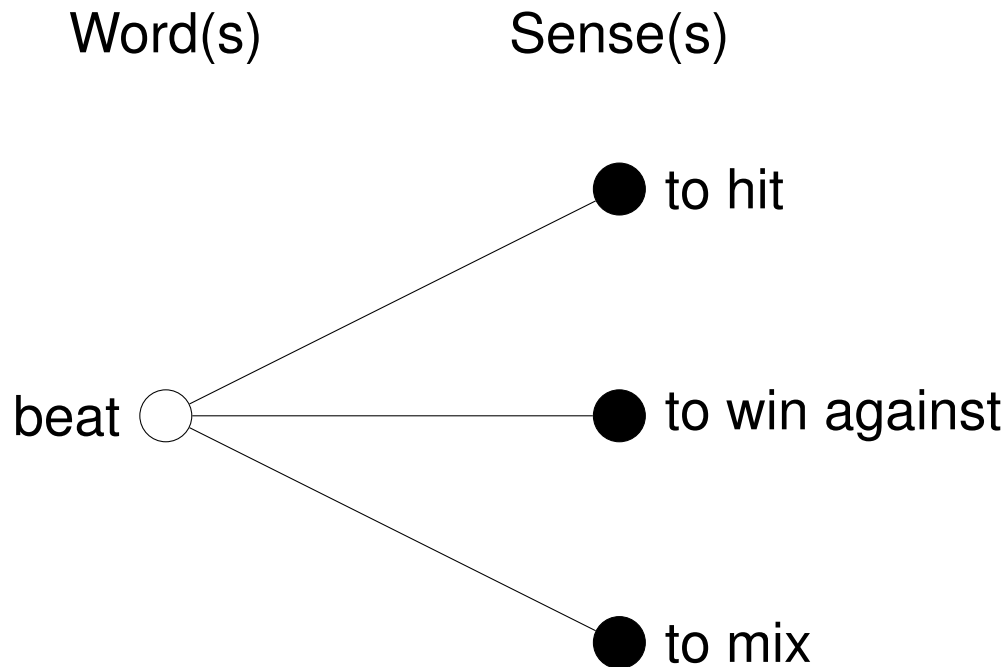Sense 1: to strike or hit repeatedly
Sense 2: to win against
Sense 3: to mix thoroughly
etc.

https://dictionary.cambridge.org/dictionary/english-german/beat

© 2012 Universität Tübingen

Ambiguity

Word(s)   Sense(s)

© 2012 Universität Tübingen

Structural Ambiguity

In the case of **structural ambiguity**, "the two senses (or readings) arise because the grammar of the language can assign two different structures to the same string of words, even though none of those words is itself ambiguous. [...] syntactic structure makes a crucial contribution to the meaning of an expression. "

Kroeger (2019). Analyzing meaning, p. 23-24.

(5) Two cars [were reported stolen] [by the Groveton police] yesterday.

(6) Two cars [were reported] [stolen by the Groveton police] yesterday.

(7) One morning I [shot an elephant] [in my pajamas].

(8) One morning I shot [an elephant in my pajamas].

Referential Ambiguity

The usage of anaphoric expressions (or other types of NPs) with ambiguous antecedents is called **referential ambiguity**.

Kroeger (2019). Analyzing meaning, p. 24.

(9) Adams$_{i(?)}$ wrote frequently to Jefferson$_{i(?)}$ while he$_i$ was in Paris.

(10) [$_{NP}$ My student] has won a Rhodes scholarship.

© 2012 Universität Tübingen

Lexical Ambiguity: Polysemy versus Homonymy

"Two types of lexical ambiguity are traditionally distinguished: **polysemy** (one word with multiple senses) vs. **homonymy** (different words that happen to sound the same). Both cases involve an ambiguous word form; the difference lies in how the information is organized in the speaker's mental lexicon."

Kroeger (2019). Analyzing meaning, p. 89.

Ambiguity (Polysemy)

Word(s)   Sense(s)

beat ○ ————————— ● to hit

beat ○ ————————— ● to win against

beat ○ ————————— ● to mix

© 2012 Universität Tübingen
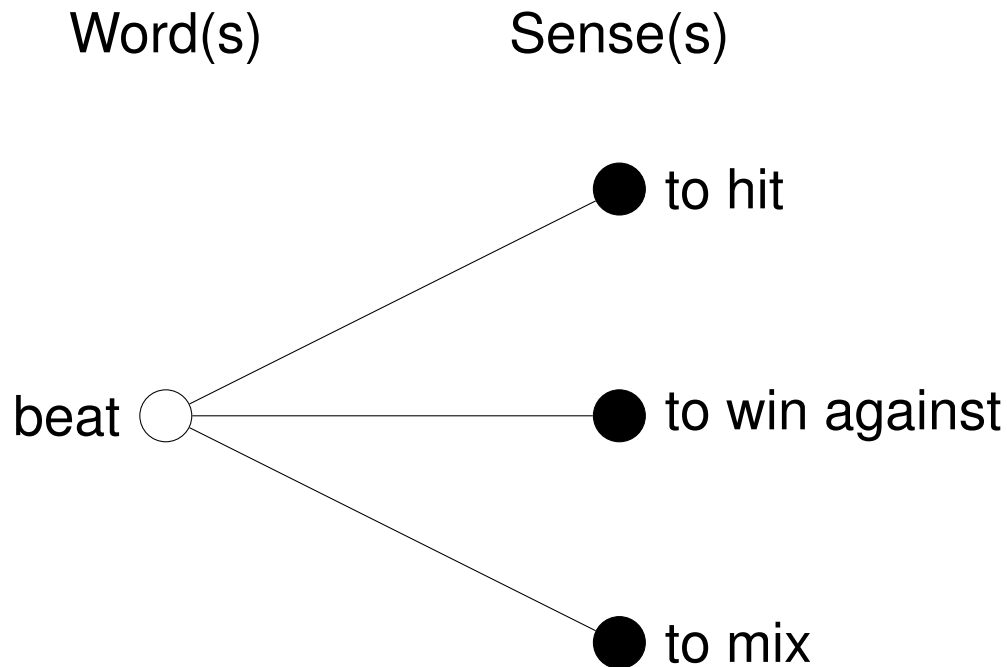
Ambiguity (Homonymy)

Word(s)   Sense(s)

can ○───────────────● to be able to

can ○───────────────● a type of container
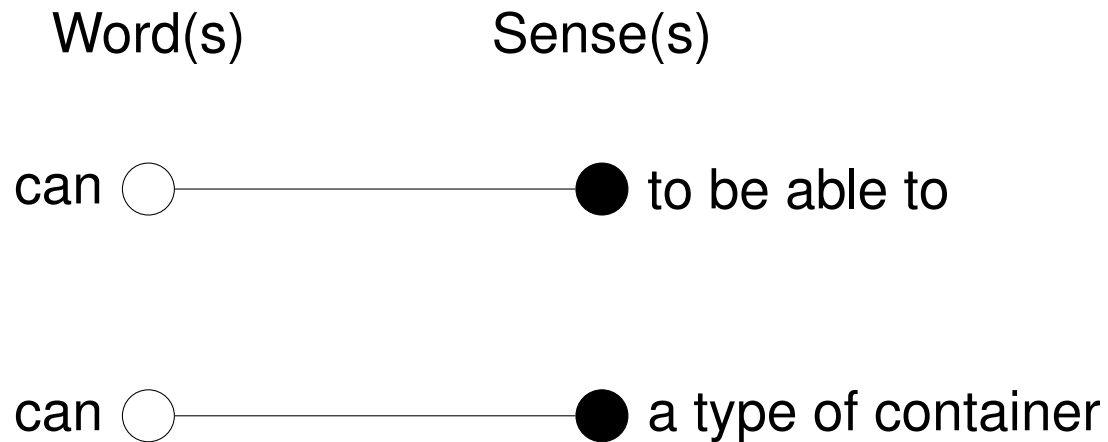
Distinguishing Polysemy and Homonymy

"The basic criterion for making this distinction is that in cases of **polysemy**, the two senses are felt to be "related" in some way; there is "an intelligible connection of some sort" between the two senses. In cases of **homonymy**, the two senses are unrelated; that is, the semantic relationship between the two senses is similar to that between any two words selected at random."

Kroeger (2019). Analyzing meaning, p. 89.

Criteria for Polysemy

1. Semantic **feature/component sharing** (e.g. *foot* as bodypart and length measurement)
2. **Figurative extension** (e.g. *a road runs*)
3. Existence of a **primary sense** (e.g. the primary sense of *foot* is the body part)
4. **Etymology** (i.e. reconstructing the lexical sources, a method mostly used in dictionaries)

Kroeger (2019). Analyzing meaning, p. 90.

A note on the "Etymological Fallacy"

"A particular manifestation of the failure to respect the distinction of the **diachronic** and the **synchronic** in semantics ... is what might be called the **etymological fallacy**: the common belief that the meaning of words can be determined by investigating their origins. The etymology of a lexeme is, in principle, synchronically irrelevant."

Kroeger (2019). Analyzing meaning, p. 91, citing Lyons (1977: 244).

Comment: It is true that "speakers may or may not know where certain words come from historically, and their ideas about such questions might be mistaken". However, for deciding the question of whether we are dealing with homonymy or polysemy when word forms are ambiguous, historic information (if available) is probably the only hard evidence to decide the question, and this is why lexicographers use etymological information.

Example: Etymology

Old English   Modern English

cunnan (to know) ◯————————● can (auxiliary)

canne (cup) ◯————————● can (type of container)

Systematic or Regular Polysemy

"A number of authors have distinguished between **regular** or **systematic polysemy** vs. **non-systematic polysemy**. Systematic polysemy involves senses which are related in recurring and predictable ways. [...] The kinds of patterns involved in systematic polysemy are similar to patterns which are associated with derivational morphology in some languages."

Kroeger (2019). Analyzing meaning, p. 91.

English nouns	English verbs	German nouns	German verbs
hammer	to hammer	Hammer	hämmer-n
saw	to saw	Säge	säge-n
paddle	to paddle	Paddel	paddel-n
plow	to plow	Pflug	pflüge-n
chain	to chain	Kette	an-ketten

Disambiguation:
The "one sense at a time" principle

"The **context**[3] of the utterance usually singles out ... the *one* sense, which is intended, from amongst the various senses of which the word is potentially capable."

Kroeger (2019). Analyzing meaning, p. 94, citing Cotterell & Turner (1989: 175).

					steep (unreasonable)	banks (institution)
rare (uncommon)	ferns	grow	on	the	steep (slope)	banks (river)
rare (slightly cooked)					steep (soak thoroughly)	banks (row of instruments) etc.

---

[3]Note: We might further distinguish between **co-text** and **context**, where the former refers to the words preceding or following the word to be disambiguated, whereas the latter refers more generally to our knowledge about the world.

Ambiguity: A Different Perspective

Ambiguity in Communication

Terms such as *ambiguity*, *vagueness*, *indeterminacy* are often associated with negative connotations. However, from an information-theoretic point of view these might be necessary aspects of human communication.
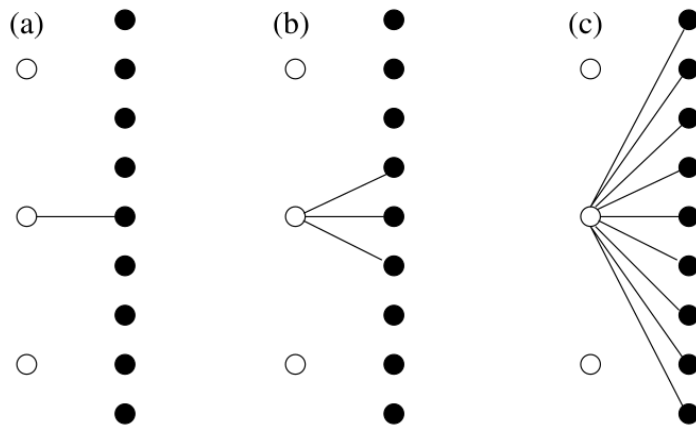
Figure 1. Some mappings between signals (white circles) and stimuli (black circles) that are minima of $H(S)$ and $H(S|R)$ with $n = 3$ signals and $m = 9$ stimuli. (a)–(c) are minima of model A while (c) is the only valid minima of model B.

Ferrer-i-Cancho & Diaz-Guilera (2007). The global minima of the communicative energy of natural communication systems.

© 2012 Universität Tübingen

Ambiguity in Communication

Imagine a language that always maps exactly one word with exactly one sense, this would require a potentially infinite number of words to cover all senses. Ambiguity, on the other hand, allows for re-usage of the same word forms, and hence reduces the load of learning different forms.
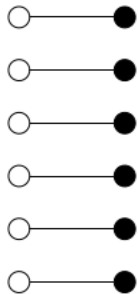

Figure 3. A one-to-one mapping between $n = 6$ signals (white circles) and $m = 6$ stimuli (black circles). This configuration achieves maximum $I(S, R)$.

Ferrer-i-Cancho & Diaz-Guilera (2007). The global minima of the communicative energy of natural communication systems.

Iterated Learning

"We show that languages transmitted culturally evolve in such a way as to maximize their own transmissibility: over time, the languages in our experiments become easier to learn and increasingly structured. Furthermore, this structure emerges purely as a consequence of the transmission of language over generations [...]"

Fig. 3. An example evolved language in the first experiment. This language exhibits systematic underspecification, enabling learners to reproduce the whole language from a fragment.
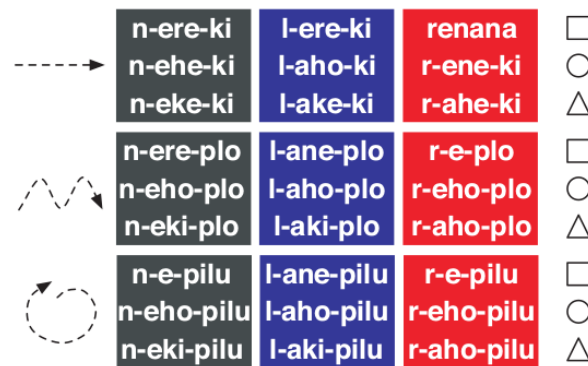
Fig. 5. An example evolved language in the second experiment. The language is structured: the string associated with a picture consists of substrings expressing color, shape, and motion, respectively. The hyphens represent 1 way of analyzing the substructure of these strings and are added purely for clarity; participants in the experiment always produced strings of characters without spaces or any other means of indicating substructure.

Kirby et al. (2008). Cumulative cultural evolution in the laboratory: An experimental approach to the origins of structure in human language.

The Advantages of Ambiguity

"We present a general information-theoretic argument that all efficient communication systems will be ambiguous, assuming that context is informative about meaning. We also argue that ambiguity allows for greater ease of processing by permitting efficient linguistic units to be re-used. Our results and theoretical analysis suggest that ambiguity is a functional property of language that allows for greater communicative efficiency."
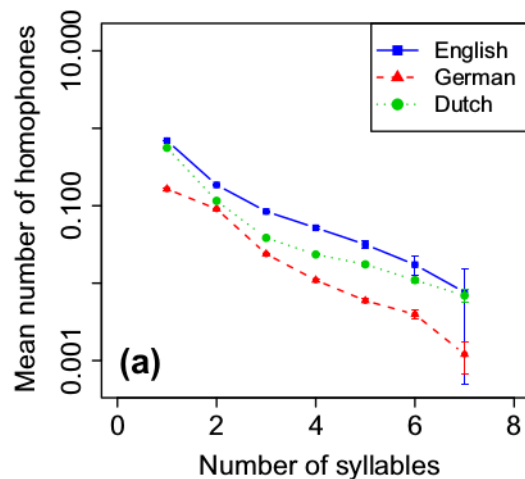
Piantadosi et al. (2012). The communicative function of ambiguity in language.

Indeterminacy

Indeterminacy

A type of variable reference, i.e. a word can have variability in its reference despite having a single defined sense. That is, the sense is **indeterminate** with regards to a particular dimension of meaning.

Kroeger (2019). Analyzing meaning, p. 81.

cousin, noun
Sense: a **son or daughter** of one's uncle or aunt.

https://dictionary.cambridge.org/dictionary/english-german/cousin

Note: The term *cousin* in English does not further specify the gender of the person referred to. Hence, it is indeterminate with regards to natural gender. In German, the natural gender is determined by the gender of the article and a suffix (*der Cousin/ die Cousin-e*).

Vagueness

Vagueness

A word is **vague** if the "limits of its possible denotations cannot be precisely defined."[4]

Kroeger (2019). Analyzing meaning, p. 81.

tall, adjective
Sense: (of people and thin or narrow objects such as buildings or trees) **higher than normal**

https://dictionary.cambridge.org/dictionary/english-german/tall

Note: The question here is "what is a *normal* height under which exact conditions?" In fact, this question can be answered precisely by statistics (e.g. more than two standard deviation above average), but humans do not necessarily use such words in a statistically precise way.

---

[4]Vagueness is sometimes also contrued as a cover term including indeterminacy as a sub-type. However, here the two are argued to be different concepts.

Example
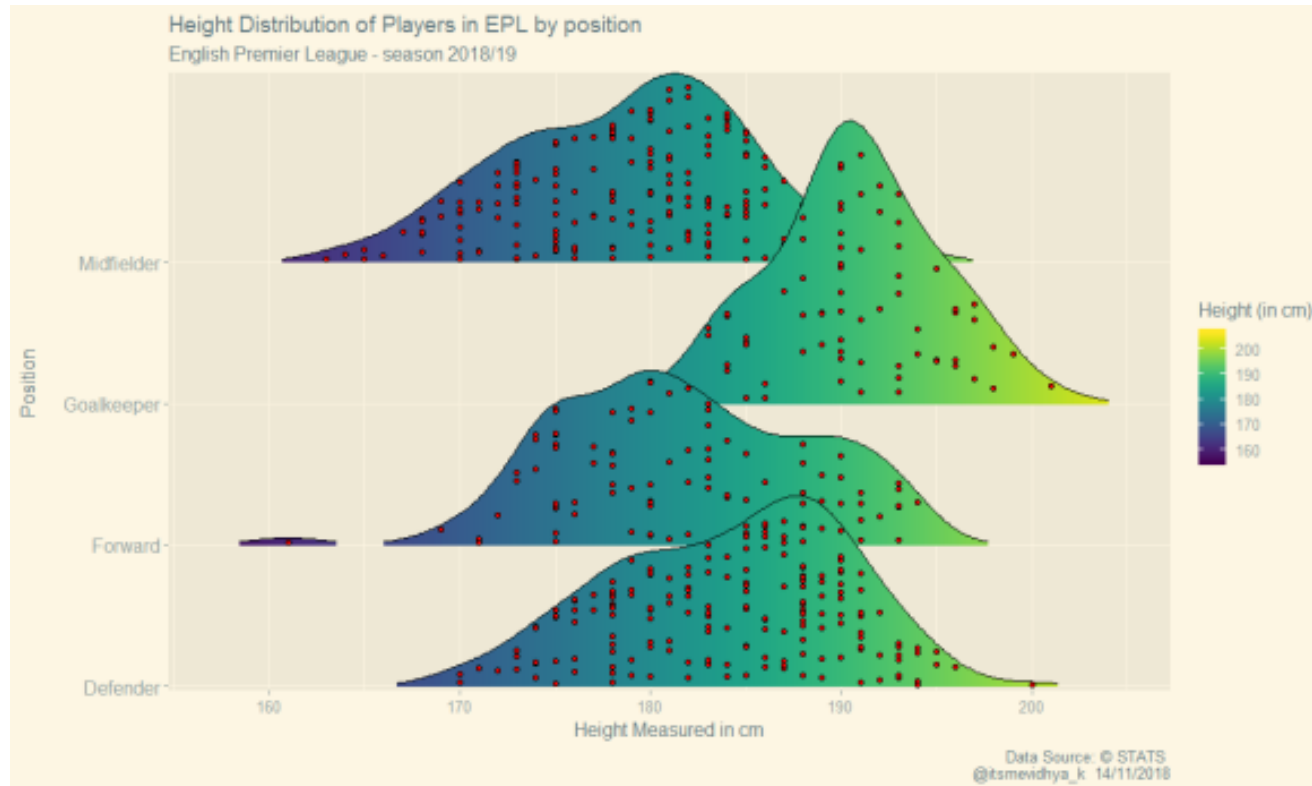
Note: A height of 190cm is relatively tall for an English Premier League midfielder, but only average for a English Premier League goalkeeper.

https://itsmevidhyak.wordpress.com/2018/11/14/height-distribution-of-players-in-epl/

Indeterminacy versus Vagueness

There are three charactersitics of vagueness which distinguish it from indeterminacy:

▶ **Context-dependence**: While the denotation of a vague word (e.g. *tall*) depends on the context (i.e. English Premier League Midfielder vs. Goalkeeper), the denotation of an indeterminate word does not depend on context (e.g. the family relationship indicated by *cousin* does not change according to context).

▶ **Borderline cases**: vague words display borderline cases due to their gradability (e.g. is 180cm tall for a EPL midfielder?), while for indeterminate words there is usually no disagreement (e.g. there is usually no disagreement about whether sb. is sb. else's cousin).

▶ **"Little-by-little" paradoxes**: due to the gradability of vague words, it is hard (impossible?) to determine when a certain denotation is justified (e.g. when exactly does a person with hair become a bald person?).

© 2012 Universität Tübingen

Indeterminacy versus Vagueness

"Another property which may distinguish vagueness from indeterminacy is the degree to which these properties are preserved in translation. Indeterminacy tends to be **language-specific**. There are many interesting and well-known cases where pairs of translation equivalents differ with respect to their degree of specificity."

Kroeger (2019). Analyzing meaning, p. 83.

English   Mandarin Chinese

○ bóbo (father's elder brother)

○ shushu (father's elder brother)

uncle ○   ○ guzhàng (father's sister's husband)

○ jiùjiu (mother's brother)

○ yízhàng (mother's sister's husband)

Another Example

English   Tzeltal (Mayan, Mexico)

cuch (carry on one's back)

q'uech (carry on one's shoulder)

pach (carry on one's head)

cajnuc'tay (carry over one's shoulder)

lats (carry under one's arm)

chup (carry in one's pocket)

tom (carry in a bundle)

pet (carry in one's arms)

nol (carry in one's palm)

jelup'in (carry across one's shoulder)

nop' (carry in one's fist)

etc.

carry
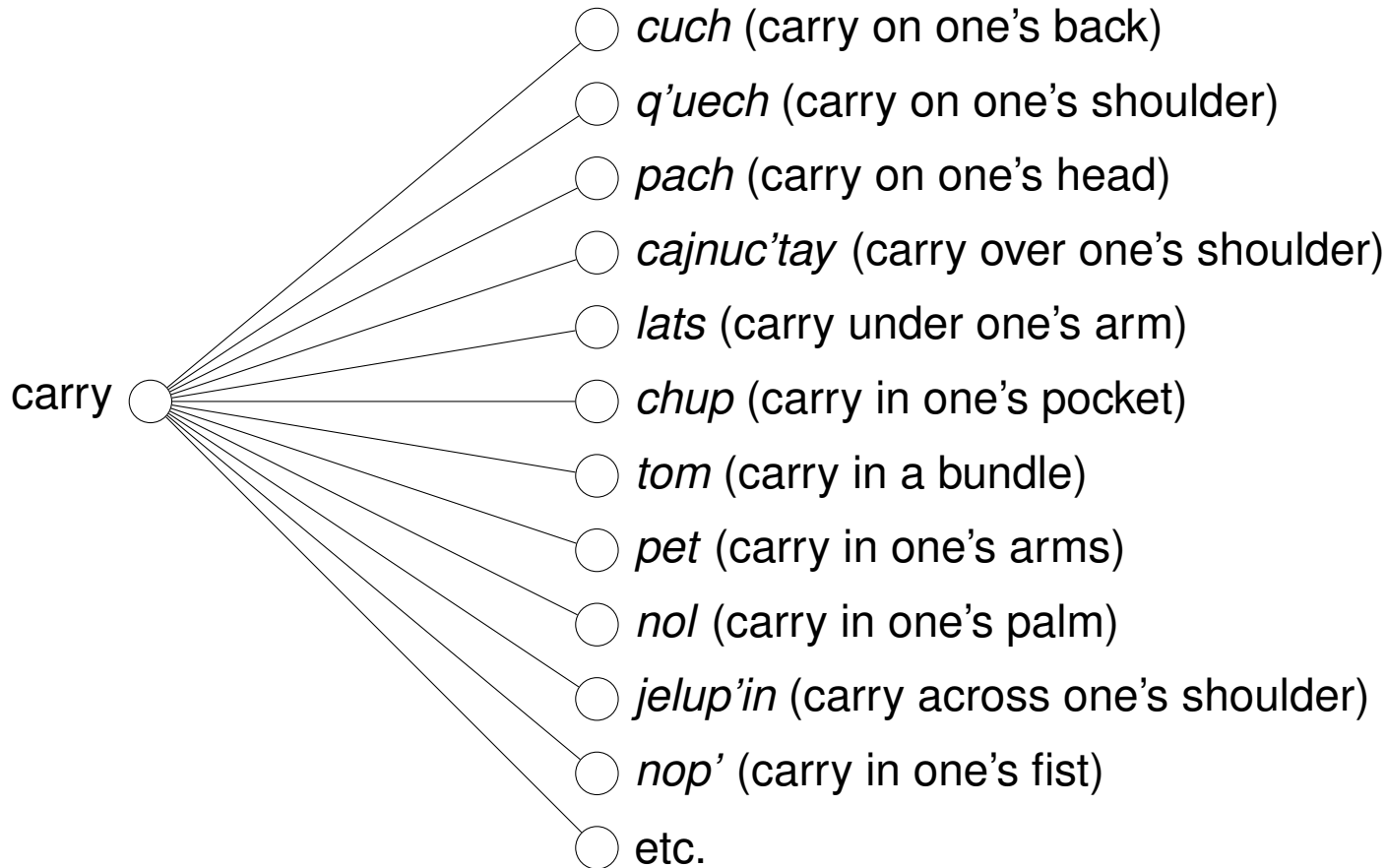
Tests for Types of Variable Reference

Ambiguity vs. Vagueness/Indeterminacy

There are a range of tests proposed in the literature which are based on the fact that senses of ambiguous words are **antagonistic**, meaning that they cannot apply simultaneously:

- ▶ Zeugma Test
- ▶ Identity Test
- ▶ Sense Relations Test
- ▶ Contradiction Test

Kroeger (2019). Analyzing meaning, p. 84.

Zeugma Test

> "A clash or incompatibility of senses for a single word in sentences containing a co-ordinate structure [...] is often referred to using the Greek term **Zeugma** (pronounced [ˈzugmə])."
>
> Kroeger (2019). Analyzing meaning, p. 85.

(11)   On his fishing trip he *caught* three trout and a cold.

Note: The fact that we can create a zeugma here with the two senses of *catch*, suggests that the senses are *antagonistic*, and hence catch is *lexically ambiguous*.

Identity Test

"This test makes use of the fact that certain kinds of **ellipsis** require **parallel interpretations** for the deleted material and its antecedent."

Kroeger (2019). Analyzing meaning, p. 85.

(12)   John saw her *duck*.

(13)   John saw her *duck*, and so did Bill.

(14)   John saw her *cousin*, and so did Bill.

Note: duck can mean here *lower her head* or *water fowl*. In the latter example, both interpretations are still possible, however, the interpretations have to be identical, i.e. either both John and Bill saw her *lower her head*, or both saw her *water fowl*. In the case of *cousin*, however, it could be (arguably?) two cousins with different genders.

Sense Relations Test

"Distinct senses will have different sets of synonyms, antonyms, etc. [...] this test is not always reliable, because contextual features may restrict the range of possible synonyms or antonyms for a particular use of a word which is merely vague or indeterminate."

Kroeger (2019). Analyzing meaning, p. 87.

(15)   It is *light*.

(16)   No, it is *dark*.

(17)   No, it is *heavy*.

Note: *light* can mean here *brightly coloured* or *has little weight*. The first sense is an antonym of *dark*, the second sense is an antonym of *heavy*.

Contradiction Test

"If a sentence of the form *X but not X* can be true (i.e. not a contradiction), then expression must be ambiguous."

Kroeger (2019). Analyzing meaning, p. 87-88.

(18)   They are not *children* any more, but they are still my *children*.

(19)   It is *light*, but not *light*.

(20)   He is my *cousin*, but not my *cousin*.

Note: *children* is used here in two distinct senses, i.e. *offspring* and *preadolescent person*, hence, there is no strict contradiction. The second example might be somewhat of a marked usage, but it is strictly speaking no contradiction, if we assume two distinct senses of *light*. Contrast this with the same structure for *cousin*, which now gives rise to a contradiction.

Summary

Summary

► There are different types of **variable reference**: ambiguity, indetermincay, vagueness.

► **Ambiguity** is further subdivided into **polysemy** and **homonymy**.

► **Vagueness** is sometimes summarized under **indeterminacy**, but they can be distinguished by context-dependence, borderline cases, and little-by-little paradoxes.

► Ambiguity might be distinguished from indeterminacy/vagueness by a test battery: **Zeugma test, identity test, sense relations test, contradiction test**.

References

References

Blasi, Damian E., Wichmann, Søren, Hammarström, Harald, Stadler, Peter F. & Christiansen, Morten H. (2016). Sound-meaning association biases evidenced across thousands of languages. *PNAS* (113), 39, pp. 10818-10823.

Dingemanse, Mark, Blasi, Damian E., Lupyan, Gary, Christiansen, Morten H. & Monaghan, Padraic (2015). Arbitrariness, iconicity, and systematicity in language. *Trends in Cognitive Sciences* (19), 10, pp. 603-615.

Ferrer-i-Cancho, Ramon, & Díaz-Guilera (2007). The global minima of the communicative energy of natural communication systems. *Journal of Statistical Mechanics: Theory and Experiment*.

Kirby, Simon, Cornish, Hannah, & Smith, Kenny (2007). Cumulative cultural evolution in the laboratory: An experimental approach to the origins of structure in human language. *PNAS* (105), 31, pp. 10681-10686.

Leslau, Wolf (1995). *Reference grammar of Amharic.* Wiesbaden: Harrassowitz.

Müller, Stefan (2019). *Grammatical theory: From transformational grammar to constraint-based approaches. Third revised and extended edition. **Volume I**.* Berlin: Language Science Press.

Ogden, C. K., & Richards, I. A. (1923). *The meaning of meaning.* Orlando, Florida: Harcourt Brace Jovanovich.

Piantadosi, Steven T., Tily, Harry, & Gibson, Edward (2012). The communicative function of ambiguity in language. *Cognition* (122), pp. 280-291.

Quine, Willard van Orman (1960). *Word and object*. Cambridge, Massachusetts: MIT Press.

de Saussure, Ferdinand (1995). *Cours de linguistique générale.* Publié par Charles Bailly et Albert Sechehaye avec la collaboration de Albert Riedlinger. Édition critique prepareé par Tullio de Mauro. Paris: Payot.

Thank You.

Contact:

Faculty of Philosophy
General Linguistics
Dr. Christian Bentz
SFS Wilhelmstraße 19-23, Room 1.24
chris@christianbentz.de
Office hours:
During term: Wednesdays 10-11am
Out of term: arrange via e-mail