

- **Semantics:**
Sentence meaning relations

Background reading:

- CL Ch 6, §1.2, "Semantic relations involving sentences"

1. Review: Sentence meaning and entailment

- When we know the **meaning** of a (declarative) sentence, we know the **circumstances** under which the sentence would be **true** or **false** — known as the **truth conditions** of the sentence
 - **Intension** of a sentence =
 - **Extension** of a sentence in a given situation =

1. Review: Sentence meaning and entailment

- When we know the **meaning** of a (declarative) sentence, we know the **circumstances** under which the sentence would be **true** or **false** — known as the **truth conditions** of the sentence
 - **Intension** of a sentence = **its truth conditions**
 - **Extension** of a sentence in a given situation = **its truth value** (*true or false*) in that situation

1. Review: Sentence meaning and entailment

- Once we have a way to think about sentence meaning, we can examine ways in which the meaning of one sentence **relates** to that of another
 - **entailment**
 - **paraphrase**
 - **contradiction**

1. Review: Sentence meaning and entailment

- From *CL*, p 222: “When the truth of one sentence guarantees the truth of another sentence, we say that there is a relation of **entailment**.”
 - What does “guarantees the truth” mean here?
→ Consider: This is about **truth conditions**
- A more explicit definition of **entailment**:
Sentence A entails sentence B if in all situations where sentence A is true, sentence B is also true
(examples in Monday’s outline slides)

2. Paraphrase

Paraphrase is another meaning relation between sentences

- From *CL*, p 221: “Two sentences that have essentially the same meaning are said to be **paraphrases** of each other.”
- Can we develop a more explicit definition of **paraphrase**, in terms of entailment?

2. Paraphrase

- A more explicit definition of **paraphrase**:
Sentences A and B are paraphrases of one another if A entails B and B entails A.
 - What kind of evidence do we have to provide to show that two sentences are *not* paraphrases of each other?

2. Paraphrase

- A more explicit definition of **paraphrase**:
Sentences A and B are paraphrases of one another if A entails B and B entails A.
 - What kind of evidence do we have to provide to show that two sentences are *not* paraphrases of each other?
 - Think of a situation in which one of A or B is true and the other is not

2. Paraphrase

- A more explicit definition of **paraphrase**:
Sentences A and B are paraphrases of one another if A entails B and B entails A.
- Try it: Are sentences (3) and (4) paraphrases?
(3) Lucy ate the last piece of pizza.
(4) The last piece of pizza was eaten by Lucy.

2. Paraphrase

- A more explicit definition of **paraphrase**:
Sentences A and B are paraphrases of one another if A entails B and B entails A.
- Try it: Are sentences (3) and (4) paraphrases? | **Yes**
(3) Lucy ate the last piece of pizza.
(4) The last piece of pizza was eaten by Lucy.
 - In all situations where (3) is true, (4) is also true
 - In all situations where (4) is true, (3) is also true

2. Paraphrase

- A more explicit definition of **paraphrase**:
Sentences A and B are paraphrases of one another if A entails B and B entails A.
- Try it: Are (1) and (2) (from Monday) paraphrases?
(1) Linus ate a sugar-covered doughnut.
(2) Linus ate something sweet.

2. Paraphrase

- A more explicit definition of **paraphrase**:
Sentences A and B are paraphrases of one another if A entails B and B entails A.
- Try it: Are (1) and (2) (from Monday) paraphrases? | **No**
(1) Linus ate a sugar-covered doughnut.
(2) Linus ate something sweet.
 - We showed on Monday that (2) does not entail (1), so these sentences are not paraphrases of each other

3. Contradiction

Contradiction is another meaning relation between sentences

- From *CL*, pp 222–3: “Sometimes, it turns out that if one sentence is true, then another sentence must be false. [...] When two sentences cannot both be true, we say that there is a **contradiction**.”
- Can we develop a more explicit definition for **contradiction**, inspired by the way we have defined entailment?

3. Contradiction

- A more explicit definition of **contradiction**:
Sentence A and B are contradictory if there is no situation in which both A and B can be true.
 - What kind of evidence do we have to provide to show that two sentences are *not* contradictory?

3. Contradiction

- A more explicit definition of **contradiction**:
Sentence A and B are contradictory if there is no situation in which both A and B can be true.
 - What kind of evidence do we have to provide to show that two sentences are *not* contradictory?
→ Think of a situation in which A and B are both true

3. Contradiction

- A more explicit definition of **contradiction**:
Sentence A and B are contradictory if there is no situation in which both A and B can be true.
- Are sentences (5) and (6) contradictory?
(5) The present king of France is bald.
(6) France is a republic.

3. Contradiction

- A more explicit definition of **contradiction**:
Sentence A and B are contradictory if there is no situation in which both A and B can be true.
- Are sentences (5) and (6) contradictory? | Yes
 - (5) *The present king of France is bald.*
 - (6) *France is a republic.*
 - Since a republic is a nation with no king, (5) and (6) can never be true in the same situation

4. Some real-world applications

- What is all this stuff good for? When might we care whether one sentence entails another, or one sentence contradicts another?

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- What is all this stuff good for? When might we care whether one sentence entails another, or one sentence contradicts another?
- How about situations such as...
 - legislation, contracts
 - testimony in court
 - claims of false advertising
 - ...

4. Some real-world applications

- One popular advertising technique is the use of language that tries to sound like it's making a stronger claim than it actually is
- It can be interesting to look carefully at the language of an advertisement and try to determine what claims are actually **entailed**

4. Some real-world applications

- Example:

*No other chewing gum keeps
your breath fresh longer!*

- What might the ad like you to **conclude**?
- Is this conclusion **entailed** by the language in the ad? Can you **prove** whether it is?

4. Some real-world applications

- Example:

Everything in the store is up to 75% off!

- What might the ad like you to **conclude**?
- Is this conclusion **entailed** by the language in the ad? Can you **prove** whether it is?

4. Some real-world applications

- How is it possible for people to use language in ways that communicate *more* than what is *said*?
- This is part of the linguistic subfield of **pragmatics**, the study of **language meaning in context**
 - Our next topic