

1 Reference and sense

(1) Expressions of natural language typically display **two levels** of meaning. One level is **reference** (or denotation). References are the parts of the world that give the expression informational content. For many noun phrases, like proper names and definite descriptions, their reference is an individual.

(2) a. Homer denotes




b. The president of the U.S. denotes



(3) A second level of meaning is referred to as **sense**. Let's consider the expression 'the president of the U.S.' in (2b); the reference of this expression varies with time. In 1994, for example, it denoted Bill Clinton. The reason is that this expression has a sense – you can think of it as a rule that helps you pick out its reference in different situations.

(4) Synonyms for these levels of meaning are *extension* and *intension*. The **extension** is the object and the **intension** is the rule.

 **Activity 1: Extension and intension.** Determine for each of the following pairs of expressions whether the two expressions have the same current extension or the same intension or both.

- a. The NCAA women's college basketball champion
The UConn women's basketball team
- b. The president of the United States
The commander in chief of the United States
- c. The king of France
The male monarch of France
- d. The UConn President
Susan Herbst

2 Implication relations: entailment, implicature, presupposition

(5) An important reflection of speakers' semantic competence is their knowledge about **implication relations** between sentences. We often say that a sentence, or an utterance of a sentence, *implies* something – often expressible as another sentence. Or we might say that sentence A *suggests* or *conveys* sentence B. We identify **two dimensions**. The first dimension has to do with whether the implication derives from the truth conditions of the sentence (*entailment*), or if it derives from principles of conversation (*implicature*). The second dimension has to do with the status of the implication. If the implication is part of the information given by the speaker, we talk about an *assertion*; if the implication is something the speaker knows to share some mutual knowledge with the hearer, we talk about a *presupposition*.

2.1. Entailment

(6) A group of sentences G **entails** a sentence S if and only if whenever every member of G is true, S is also true:

- (7) Piper Chapman saw all the prisoners.
- (8) Suzanne 'Crazy Eyes' is one of the prisoners.
- (9) Piper Chapman saw Suzanne 'Crazy Eyes'.

In all situations in which (7) and (8) are true, (9) must also be true.
Another example:

- (10) Sheldon dislikes actresses.
- (11) Penny is an actress.
- (12) Sheldon dislikes Penny.

Another example:

- (13) Walter White is a chemist.
- (14) Walter White is bold.
- (15) Walter White is a bold chemist.

Question: What if Piper Chapman did not see 'Crazy Eyes' in the real world, if Penny is not an actress in the real world, and if Walter White is not bold in the real world? Do these relations still hold?

→ Answer: It doesn't matter. In reasoning about entailment relations, we are not concerned with the actual truth values of the propositions. We are only concerned about the truth conditions.

(16) Entailments are **non-defeasible**: the implication relation between A and B cannot be canceled. If A entails B, then whenever A is true, B must be true. A speaker can't deny or cancel an entailment without contradicting herself:

- (17) John is married to Mary.
(18) #In fact, John is not married.

(19) Entailments are **non-reinforceable**; in fact, if we try to make an entailment stronger, it sounds like very weird.

- (20) Christos smokes and drinks.
(21) # And he still smokes!

2.2. Implicature


(22) An **implicature** is something a speaker might reasonably mean by uttering a sentence, something she can expect to convey.

- (22) I used to swim at least four times a week.

(24) Implicatures are:

- **calculable**. This means there is a reasonable explanation for the implicature based on general rules of conversation.
- **defeasible**. This means they rely on inferences that are reasonable but not iron-clad.
- **reinforceable**. Since implicatures rely on defeasible reasoning, it is perfectly okay to make an implicature explicit. This is a way of reinforcing the implicature. By comparison it is very odd to reinforce an entailment.

- (25) a. I used to swim at least four times a week. **And I still do!**
b. I used to swim at least four times a week. **#In fact, I used to swim.**

 **Activity 2: Implicatures.** For each of the pairs below show that the relation between sentence a) and sentence b) is both defeasible and reinforceable.

- i) a. Joan likes some of her presents.
b. Joan doesn't like all of her presents.
- ii) a. Mary doesn't believe that John will come.
b. Mary believes that John won't come.
- iii) a. If you finish your vegetables, I will give you dessert.
b. If you don't finish your vegetables, I won't give you dessert.

2.3. Presupposition

(26) Let's consider the following sentences:

- (27) The president of the US has two daughters.
(28) The US has a president.
(29) The president of the US has exactly two daughters.

(28) is a special kind of entailment. It is called a presupposition. A **presupposition** is a background assumption. It's something we take for granted before we utter the relevant sentence. It is infelicitous to utter (27) without the assumption that the US has a president.

(29) Presupposition *projects through negation*, i.e. **the entailment-like relation still holds even if we negate the original sentence.**

(30) The president of the US doesn't have two daughters

(31) [Presupposition:] The US has a president.

(32) A fun way to test for presupposition is the 'wait-a-minute' test:

(33) a. The president of the US has two daughters

(presupposes: The US has a president)

b. Wait a minute - I didn't know the US has a president!

→ It is possible for A to both entail and presuppose B. This is because a presupposition is just a *special kind of entailment*.

→ So **when A presupposes B, it also entails it.**