Lecture 10

LCD 306: Semantics & Pragmatics

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Tuesday 17 March 2015

Outline

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Group Project

- You are just replicating, which has an extremely important and often overlooked role in science
- The proposal should be pitched for a non-linguist
- The descriptions of the methodology should be clear enough that anyone could use your description and do exactly what you did

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Logical Connectives

- And: $\wedge$
  - $[[\phi \wedge \psi]] = 1$ iff $[[\phi]] = [[\psi]] = 1$
- Or: $\vee$
  - $[[\phi \vee \psi]] = 1$ iff $[[\phi]] = 1$ or $[[\psi]] = 1$
- Exclusive Or: $\oplus$
- Entailment, Material Implication: $\rightarrow$
  - $[[\phi \rightarrow \psi]] = 1$ iff $[[\phi]] = 0$ or $[[\psi]] = 1$
- Mutual entailment, biconditional: $\leftrightarrow$
  - $[[\phi \leftrightarrow \psi]] = 1$ iff $[[\phi]] = [[\psi]]$
- Brackets: ( )

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Conjunction

- A conjunction of two propositional expressions is True iff the two propositional expressions are individually True
- $[[\phi \wedge \psi]] = 1$ iff $[[\phi]] = [[\psi]] = 1$

Truth Values

- For the statements:
  - r: "It is raining outside"
  - c: "It is cold"
  - $r \wedge c$: "It is raining outside and it is cold"

r	c	$r \wedge c$
1	1	1
1	0	0
0	1	0
0	0	0

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Disjunction

- A disjunction of two propositional expressions is True iff at least one of the two expressions is individually True
- $[[\phi \vee \psi]] = 1$ iff $[[\phi]] = 1$ or $[[\psi]] = 1$

Truth Values

- For the statements:
  - r: "It is raining outside"
  - c: "It is cold"
  - $r \vee c$: "It is raining outside or it is cold"

r	c	$r \vee c$
1	1	1
1	0	1
0	1	1
0	0	0

Assignment No. 7

Exercise 2.23

Draw a truth table for the statements:

1. 'John is home and Mary is happy'
2. 'John is home or Mary is happy'

Truth Values

- For the statements:
  - r: "It is raining outside"
  - c: "It is cold"
  - $r \oplus c$: "Either it is raining outside or it is cold"

r	c	$r \oplus c$
1	1	0
1	0	1
0	1	1
0	0	0

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Conditional

- A 'conditional' consisting of two propositional expressions is True iff the antecedent expression is False or the consequent expression is True
- $[[\phi \rightarrow \psi]] = 1$ iff $[[\phi]] = 0$ or $[[\psi]] = 1$

Truth Values

- For the statements:
  - k: "Karen went to the party"
  - g: "Gita went to the party"
  - $k \rightarrow g$: "If Karen went to the party, then Gita went to the party"

k	g	$k \rightarrow g$
1	1	1
1	0	0
0	1	1
0	0	1

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Conditional

- A ‘biconditional’ consisting of two propositional expressions is True iff the antecedent expression and the consequent expression are both True
- $[[\phi \leftrightarrow \psi]] = 1$ iff $[[\phi]] = [[\psi]]$

Truth Values

- For the statements:
  - s: "Sarah went to the party"
  - d: "Dani went to the party"
  - $k \leftrightarrow d$: "Sarah went to the party if and only if Dani went to the party"

s	d	$s \leftrightarrow d$
1	1	1
1	0	0
0	1	0
0	0	1