

1. Correction to the Solution to Assignment 1. The solution to (4) should read:

(4a) entails (4b), as there is no situation in which (a) is true, but (b) is not. As a consequence, ‘*A and not B*’ is contradictory:

c. It’s not raining, and it’s raining hard.

(4b) is in addition an assertion, and not a presupposition, since it does not project:

- d. It’s raining. -/→ It’s not raining hard.
- e. Maybe it’s not raining. -/→ It’s not raining hard.
- f. If it’s not raining hard, we’re in luck. -/→ It’s not raining hard.

2. More Set Theory!

Translate the following expressions into ordinary English:

- (1) $\{x \mid \text{Mary Grace likes } x\}$ ‘the set of all individuals that M.G. likes’
- (2) $\{x \mid \{y \mid y \text{ likes } x\} = \emptyset\}$ ‘the set of all individuals that no one likes’
- (3) $\{x \mid \{y \mid x \text{ likes } y\} = \emptyset\}$ ‘the set of all individuals that like nothing’

3. Homework Problems

Assume that: $A = \{\text{Mars}, \emptyset, \text{Leo}\}$ $B = \{\{\text{Mars}\}, \{\emptyset\}\}$
 $C = \emptyset$ $D = \{\text{Mars}\}$

- (4) a. $C \in A$ b. $\text{Mars} \in D$ c. $\text{Mars} \in B$ d. $C \in B$
- e. $D \subseteq A$ f. $C \subseteq D$ g. $\{\emptyset\} \subseteq B$ h. $D \subseteq B$
- i. $D \in B$ j. $\{C\} \in B$ k. $(C \cap D) \in B$ l. $\{\{C\}, D\} \subseteq B$

(5) Assume that U is the union of A , B , C , and D . Specify the following sets:

- a. $C \cap A$ b. $A \cap B$ c. $A \cap D$ d. $(C \cup D) - D$
- e. D' f. $(A - C)'$ g. $A - \{C\}$ h. $A \cap B \cap D$
- i. $B - (\{\{C\}\} \cup \{D\})$ (6) What is $\wp(A)$?

4. Entailment

Given our semantics for sentences, we can now define entailment as follows:

(7) S_1 entails S_2 iff for every situation s , if $\llbracket S_1 \rrbracket^s = 1$ then $\llbracket S_2 \rrbracket^s = 1$.

5. Expanding the Grammar

Our grammar does not yet account for the following sentences:

- (8) Ezgi is not speaking.
- (9) Ezgi is not singing or dancing.
- (10) Alexandra is ecstatic.
- (11) Alexandra is around.
- (12) Alexandra is a student.

How can we revise it so that it does?

6. Semantically Vacuous Words. Certain lexical items are commonly assumed to make no semantic contribution to the structure in which they occur.

One case is the copula *be* in predicative sentences such as *Alexandra is ecstatic* and *Alexandra is around*. We would want the following equalities, for example:

(13) $\llbracket \text{is ecstatic} \rrbracket^s = \llbracket \text{ecstatic} \rrbracket^s$ (14) $\llbracket \text{is around} \rrbracket^s = \llbracket \text{around} \rrbracket^s$

Another case is the indefinite article *a* when it occurs in predicate nominals such as:

(15) Alexandra is a student. (16) Kaline is a cat.

Here too we want the following equalities:

(17) $\llbracket \text{a student} \rrbracket^s = \llbracket \text{student} \rrbracket^s$ (18) $\llbracket \text{a cat} \rrbracket^s = \llbracket \text{cat} \rrbracket^s$

We will assume then that the semantic component simply “doesn’t see” the copula *be* or the indefinite article *a*. As a result, a structure that is binary branching may be treated as non-branching by the semantic rules, in that a branch occupied by a vacuous item doesn’t count.