

Week 3

- Set and function notation
- Quantifiers as relations between sets; Negative Polarity Items (NPIs)

Next:

- Propositional logic, logical connectives

Exercise (from Heim & Kratzer pages 9–10)

Consider the following equations. Are they always true, never true, or true under specific circumstances? Under what circumstances?

(1) a. $\{a\} = \{b\}$

b. $\{x : x = a\} = \{a\}$

c. $\{x : x \text{ is green}\} = \{y : y \text{ is green}\}$

d. $\{x : x \text{ likes } a\} = \{y : y \text{ likes } b\}$

e. $\{x : x \in A\} = A$

True or false:

$\{z : z \text{ read two books}\} \subseteq \{z : z \text{ read three books}\}$

(2) $every(A)(B) = 1$ iff $A \subseteq B$

returns the truth value for "Every A is B."

(3) $some(A)(B) = 1$ iff $A \cap B \neq \emptyset$

returns the truth value for "Some A is B."

(4) $no(A)(B) = 1$ iff $A \cap B = \emptyset$

returns the truth value for "No A is B."

Exercise: Take a quantifier in a sentence of the form “Quantifier A B.” For example, in “Every student is sleeping,” the quantifier is “every,” A = “student,” and B = “is sleeping.” Define the truth conditions of “Quantifier A B” in terms of the sets *A* and *B*. (We ignore number morphology and agreement here.)

1. a

2. two

3. more than two

4. more than half

5. most

6. not all

7. the (singular)

ex: ‘the dog’

8. the (plural)

ex: ‘the dogs’

Answers:

- (5) $every(A)(B) = 1$ iff $A \subseteq B$
- (6) $a/some(A)(B) = 1$ iff $A \cap B \neq \emptyset$
- (7) $no(A)(B) = 1$ iff $A \cap B = \emptyset$
- (8) $two(A)(B) = 1$ iff $|A \cap B| \geq 2$
- (9) $more-than-two(A)(B) = 1$ iff $|A \cap B| > 2$
- (10) $most(A)(B) = 1$ iff $|A \cap B| > |A \setminus B|$
- (11) $not\ all(A)(B) = 1$ iff $A \setminus B \neq \emptyset$
- (12) $the_{sg}(A)(B) = 1$ iff $|A| = 1$ and $A \subseteq B$