Quantifiers: Their Semantic Type (Part 3)

Heim and Kratzer

Chapter 6

6.7 Presuppositional quantifier phrases

6.7.1 “Both” and “neither”

(1a) Neither cat has stripes.
(1b) Both cats have stripes.

- (1a) and (1b) presuppose that there are exactly two cats.

- Hence, it seems that we should define the denotations of “neither” and “both” accordingly.

(2) $f_{neither} = \lambda A : A \in Pow(D)\ \&\ |A| = 2\ .\ [\lambda B \in Pow(D)\ .\ A \cap B = \emptyset]$.

(3) $f_{both} = \lambda A : A \in Pow(D)\ \&\ |A| = 2\ .\ [\lambda B \in Pow(D)\ .\ A \subseteq B]$.

6.7.2 Presuppositionality and the relational theory (SKETCH)

- The existence of presuppositional determiners is incompatible with the strictly relational theory of quantifiers: a given ordered pair either is or is not a member of a relation.

- An almost relational theory, on which determiner meanings are potentially partial functions from Pow(D) x Pow(D) to $\{0, 1\}$, would work fine:

(6a) $F_{both} = \lambda <A, B> : A \subseteq D \; \& \; B \subseteq D \; \& \; |A| = 2 \; . \; A \subseteq B.$
(6b) $F_{no} = \lambda <A, B> : A \subseteq D \; \& \; B \subseteq D \; . \; A \cap B = \emptyset.$
(9) $F_{neither} = \lambda <A, B> : A \subseteq D \; \& \; B \subseteq D \; \& \; |A| = 2 \; . \; A \cap B = \emptyset.$

- Now we have to change the definitions of the mathematical properties. C.f. the definitions on p. 157.

6.8 Presuppositional quantifier phrases: controversial cases

6.8.1 Strawson's reconstruction of Aristotelian logic

- The relational definitions of quantifying determiners that we have adopted were the ones promoted by the founders of modern logic:

(1a) $R_{every} = \{<A, B> : A \subseteq B\}$
(1b) $R_{some} = \{<A, B> : A \cap B \neq \emptyset\}$
(1c) $R_{no} = \{<A, B> : A \cap B = \emptyset\}$

- But these definitions are not consistent with certain assumptions about the semantics of these quantifying determiners that were part of (at least some versions of) Aristotelian logic.

- In that tradition, generalizations such as those in (2) were considered valid.

6.8.1 Strawson's reconstruction of Aristotelian logic (cont.)

(2) For any predicates α, β:

(i) **every** α β **and no** α β is a contradiction.

(ii) **some** α β **or no** α β is a tautology.

(iii) **every** α β entails **some** α β.

(iv) **no** α β entails **some** α **not** β.

(3a) Every first-year student in this class did well and no first-year student in this class did well.

- Aristotelian logic: (3a) is contradictory.
  Modern logic: (3a) is contingent: It is true when there are no first-year students in the class.

6.8.1 Strawson's reconstruction of Aristotelian logic (cont.)

(3b) Some cousin of mine smokes, or some cousin of mine doesn't smoke.

- Aristotelian logic: (3b) is a tautology.
  Modern logic: (3a) is contingent: It is false when the speaker has no cousins.

(3c) Every professor at the meeting was against the proposal.
$\therefore$ Some professor at the meeting was against the proposal.

- Aristotelian logic: (3c) is a valid inference.
  Modern logic: the premise in (3c) does not entail the conclusion: The former is true but the latter false when there were no profesors at the meeting.

6.8.1 Strawson's reconstruction of Aristotelian logic (cont.)

(3d) No student presentation today was longer than an hour.
$\therefore$ Some student presentation today wasn't longer than an hour.

- Aristotelian logic: (3d) is a valid inference.
  Modern logic: the premise is true, but its conclusion false if there were no student presentations today.

6.8.1 Strawson's reconstruction of Aristotelian logic (cont.)

- The empirical evidence bearing on the question as to which is correct is surprisingly difficult to assess.

- Strawson proposed that the Aristotelian laws in (2) are correct, i.e. that the determiners have the semantics in (4).

(4a) $F_{every} = \lambda < A, B > : A \neq \emptyset \,.\, A \subseteq B.$
(4b) $F_{some} = \lambda < A, B > : A \neq \emptyset \,.\, A \cap B \neq \emptyset.$
(4c) $F_{no} = \lambda < A, B > : A \neq \emptyset \,.\, A \cap B = \emptyset.$

6.8.1 Strawson's reconstruction of Aristotelian logic (cont.)

- These entries validate the Aristotelian generalizations in (2), provided that we have suitable definitions of the semantic properties.

Basic semantic properties

ϕ is a *tautology* iff the semantic rules alone establish that, if ϕ is in the domain of $[\![\ ]\!]$, then $[\![\phi]\!] = 1$.

ϕ is a *contradiction* iff the semantic rules alone establish that, if ϕ is in the domain of $[\![\ ]\!]$, then $[\![\phi]\!] = 0$.

ϕ *entails* ψ iff the semantic rules alone establish that, if ϕ and ψ are both in the domain of $[\![\ ]\!]$ and $[\![\phi]\!] = 1$, then $[\![\psi]\!] = 1$.

6.8.2 Are all determiners presuppositional?

- A strong position was taken by McCawley 1972 and Diesing 1992:

(5) *Presuppositionality Hypothesis*
In natural languages, all lexical items with denotations of type $<< e,t >, << e,t >, t >>$ are *presuppositional*, in the sense of the following mathematical definition (where δ is a lexical item of the appropriate semantic type, such as determiner):

δ is *presuppositional* iff for all A $\subseteq$ D, B $\subseteq$ D : if A = $\emptyset$, then $<$A, B$>$ $\notin$ dom(F_δ).

6.8.2 Are all determiners presuppositional?

(11) In contingent contexts, strong determiners evoke judgments that conform to the presuppositional analysis, whereas weak determiners give rise to mixed judgments that conform sometimes to the presuppositional and sometimes to the standard analysis. (Lappin & Reinhart 1988)

PRESUPPOSITION FAILURE: (strong quantifiers)
(7a) All American kings lived in New York.
(7b) All unicorns have accounts at the Chase Manhattan Bank.

HALF TRUE (8a) OR FALSE (8b), and HALF PRESUPPOSITION FAILURES (weak quantifiers):
(8a) No American king lived in New York.
(8b) Two American kings lived in New York.

TRUE (generic, law-like statements):
(9a) Every unicorn has exactly one horn.
(9b) Every unicorn is a unicorn.

6.8.3 Nonextensional interpretations

(1) Every unicorn has one horn.
(2) Every unicorn has two horns.

- (1) seems definitely true, while (2) seems definitely false.
- Thus generic statements seem to require the non-presuppositional analysis.
- But generics are modal in nature, and involve quantifying over other possible worlds, including those possible worlds in which unicorns exist.
- Perhaps these sentences require the existence of "possible" unicorns.
- These sentences don't help us choose between a presuppositional and non-presuppositional treatment of quantifying determiners.

6.8.3 Nonextensional interpretations (cont.)

- But here's an argument from Kratzer that supports the presuppositional account of generic/law-like statements. It makes sense to think of living in a world where (19a,b) are true and (19c) is false.

The Samaritan Paradox

(19a) The town regulations require that there be no trespassers.
(19b) The town regulations require that all trespassers be fined.
(19c) the town regulations require that no trespassers be fined.

- (19a) says that there is no trespassing in any possible worlds in which no town regulation is violated. But then, on a non-presuppositional account, (19b) and (19c) would both be true.

- In understanding (19b,c), we temporarily suspend the regulation that there be no trespassers; i.e. the presupposition that there are trespassers is playing a role here.

6.8.4 Nonpresuppostional behavior in weak determiners

(20a) No phonologists with psychology degrees applied for our job. (TRUE if there aren't any)

(20b) Two UFOs landed in my backyard yesterday. (FALSE if there aren't any).

(8a) No American king lived in New York. (TRUE or PRESUPPOSITION FAILURE)

(21a) There were no American kings in New York (TRUE)

(8b) Two American kings lived in New York. (FALSE or PRESUPPOSITION FAILURE)

(21b) There were two American kings in New York (FALSE)

(22a) If you find every/most mistake(s), I'll give you a fine reward. (PRESUPPOSITIONAL)

(22b) If you find many/a/no/three mistake(s), I'll give you a fine reward (NON-PRESUPPOSITIONAL)

6.8.4 Nonpresuppostional behavior in weak determiners (cont.)

- Diesing 1990 proposed that subjects are generated inside the VP, and that strong DPs raise into SPEC-IP, whereas weak DPs may or may not raise–only if they do are they presuppositional (the Mapping Hypothesis). Those that don't raise are of type $< e, t >$.

- De Hoop 1992 proposed that the difference lies in case marking: i.e. [NH: something like] genitive or bare DPs do not raise; whereas nominative or accusative DPs do raise if topical. Those that don't raise are of type $< e, t >$.

- Others believe it has to do solely with topic and focus: topic DPs are presuppositional; whereas focus DPs aren't.