Practice midterm exam

Chris Potts, Ling 130a/230a: Introduction to semantics and pragmatics, Winter 2025

This handout provides model answers to questions like those on the midterm. For model answers to questions about quantifier properties, see ‘Some formal analyses of determiners’ [link].

1 What kind of modifier is this?

Consider the following hypothetical adjective meaning:

$[\![\mathit{dax}]\!] = \lambda X \Bigg(\Bigg\{$  $\Bigg\} \cup X \Bigg)$

What is the classification of this adjective according to the Partee typology?

Model answer

This adjective meaning is **non-subsective**. (That is the required part. Here is some optional explanation:) For example, where $A = \{[\![\mathit{lisa}]\!]\}$, we have that $[\![\mathit{dax}]\!](A) \nsubseteq A$ because $[\![\mathit{dax}]\!](A) = \{[\![\mathit{maggie}]\!], [\![\mathit{lisa}]\!]\}$. More generally, for any X where $\{[\![\mathit{Maggie}]\!]\} \nsubseteq X$, we have that $[\![\mathit{dax}]\!](X) \nsubseteq X$, because in those situations $[\![\mathit{dax}]\!](X) \supset X$. (Note: I don’t think adjectives like this can exist in natural languages.)

2 Novel compounds

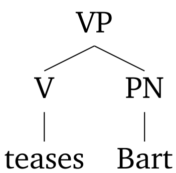
In Levin et al.’s free-response comprehension experiment, 19/20 responses for *salad glove* were coded as ‘Purpose’. (The one other response was ‘Color’.) Is this expected under their account? Say why or why not. In writing your answer, make sure to (1) classify the modifier, the head, and the compound itself as artifact or natural kind, and (2) make meaningful use of the relevant core hypothesis from their paper. (3–4 sentences should suffice.)

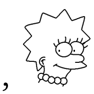
Model answer

In the compound *salad glove*, both the head and the modifier are artifacts, and the entire compound likely refers to an artifact as well – it seems like some kind of wearable cooking item. The 19 responses that classified the head–modifier relation as ‘Purpose’ are in-line with Levin et al’s hypotheses. In particular, ‘Purpose’ is an event-related modifier designation, just as the event-related modifier hypothesis predicts for artifacts. By contrast, the one ‘Color’ case is not aligned with their hypotheses, since this is one of the Perceptual categories, a subtype of relations we expect for compounds referring to natural kinds. Overall, though, the response distribution seems consistent with Levin et al’s proposal. After all, they are not claiming that compound head–modifiers relations are fully predictable or determined by their parts.

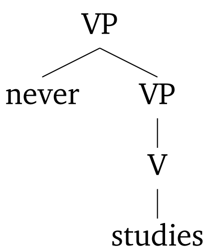
3 Compositional analysis

For each of the top (root) nodes in the following trees, provide (i) the name of the rule you used to derive that meaning from its constituent parts, according to the handout ‘Semantic composition’, and (ii) the meaning itself after all the allowable substitutions from function applications. Thus, for example, given the tree on the left, either answer at right would be complete and accurate:



Rule (TV) derives $\{$  ,  $\}$

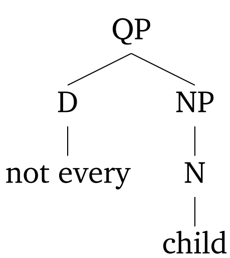
3.1



Model answer

Rule N derives $U - [\![\textit{studies}]\!] = \{[\![\textit{Bart}]\!], [\![\textit{Homer}]\!], [\![\textit{Maggie}]\!]\}$

3.2



Model answer

Rule Q1 derives $\lambda Y(\mathsf{T}$ if $[\![\textit{child}]\!] \nsubseteq Y$, else $\mathsf{F})$

4 Extra functional application practice

Reduce the following expressions by applying the necessary application and substitution steps. You should reduce the expressions as far as is possible, including subexpressions.

i. $\big(\lambda x(4)\big)(5)$

Model answer

4

ii. $\big(\lambda y\big(\lambda x(x > y)\big)\big)(4)$

Model answer

$\lambda x(x > 4)$

iii. $\Big(\Big(\lambda f\big(\lambda x(x < f(4))\big)\Big)\big(\lambda y(1 + y)\big)\Big)(2)$

Model answer

Optionally showing intermediate steps. Only the last line is required, and the lines before it would not earn full credit on their own due to lingering unconverted lambdas:

$$\Rightarrow \Big(\lambda x\big(x < \big(\lambda y(1 + y)\big)(4)\big)\Big)(2)$$
$$\Rightarrow \big(\lambda x(x < (1 + 4))\big)(2)$$
$$\Rightarrow 2 < (1 + 4)$$

5 Quantifier entailment

In the context of our semantic grammar, we can say that a determiner D entails a determiner D' if and only if, whenever $D(A)(B) = \mathsf{T}$, it holds that $D'(A)(B) = \mathsf{T}$, for all sets A and B. Does $[\![\textit{not every}]\!]$ entail $[\![\textit{some}]\!]$ in this sense? Either prove that this entailment relation holds or prove that it does not hold by presenting a counterexample and articulating why it is a counterexample. The meanings for $[\![\textit{not every}]\!]$ and $[\![\textit{some}]\!]$ are given in (11) and (5) of the 'Quantifier properties' handout.

Model answer

According to this theory, $[\![\textit{not every}]\!]$ does not entail $[\![\textit{some}]\!]$. Consider $A = \{1, 2\}$ and $B = \{3, 4\}$. $[\![\textit{not every}]\!](A)(B) = \mathsf{T}$; since A and B are disjoint, A is not a subset of B. But in virtue of these sets being disjoint, we have that $A \cap B = \emptyset$ and thus $[\![\textit{some}]\!](A)(B) = \mathsf{F}$.

6 Intersective?

Consider the hypothetical quantificational determiner *uneq*:

$$[\![hartig]\!] = \lambda X\Big(\lambda Y\big(\mathsf{T} \text{ if } |X| = |Y, \text{ else } \mathsf{F}\big)\Big)$$

Is this hypothetical determiner intersective (in the sense of our theory of quantificational determiners)? Either show that it is intersective or present a counterexample and explain why it is a counterexample.

Model answer

This determiner is intersective. This follows directly from the fact that the equality relation is order independent: if $|A| = |B|$, then $|B| = |A|$ for all A and B. Thus, $[\![hartig]\!](A)(B) = [\![hartig]\!](B)(A)$.

7 Monotonicity

Here is our usual definition of the quantificational determiner $[\![\textit{not every}]\!]$:

$$[\![\textit{not every}]\!] = \lambda X\Big(\lambda Y\big(\mathsf{T} \text{ if } X \nsubseteq Y, \text{ else } \mathsf{F}\big)\Big)$$

Diagnose the first (restriction) argument as upward, downward, or nonmonotone, and explain why this holds using $[\![\textit{not every}]\!]$. (Note: this isn't a question about your intuitions, but rather about what we are predicting with $[\![\textit{not every}]\!]$.)

Model answer

The first argument of $[\![\textit{not every}]\!]$ is upward monotone. To see this, assume that $[\![\textit{not every}]\!](A)(B) = \mathsf{T}$ for some A and B. This means that there is some x such that $x \in A$ but $x \notin B$. Any X such that $A \subseteq X$ will also contain this element x, and thus $X \nsubseteq B$, which means $[\![\textit{not every}]\!](X)(B) = \mathsf{T}$.