Implicit Restrictors of Quantifiers and Definites, Continued

1. Overview of the main puzzles to be solved

1.1. How are quantifier domains restricted?

1.2. How are definite descriptions (and pronouns) interpreted?

Puzzles and problematic data.

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Puzzle 1: bound definites with implicit bound variables inside

Puzzle 2: The problem of indistinguishable participants – a problem for D-type.

Puzzle 3: The problem of the formal link (anaphoric islands). Problem for D-type.

Puzzle 4: The problem of “pronominal ambiguity”, i.e. wanting a “uniform” analysis. Problem for “old” D-type.

Puzzle 5, for dynamic theories: Disjunctive antecedents.

Puzzle 6, for dynamic theories: “Deep anaphora” – no linguistic antecedent.

Puzzle 7, for dynamic theories: “Neontological Pronouns”.

Puzzle 8: Weak and Strong readings of donkey sentences.

2. Do we need all three ingredients – implicit NP, relation variables, situation variables?

References.

Note: This handout can be downloaded (so that links to references can be clicked) from the course website, [http://people.umass.edu/partee/720_09/materials/index.html](http://people.umass.edu/partee/720_09/materials/index.html).

Readings

(Elbourne 2005) *Situations and Individuals* – Chapters 1-4 and 7

(Elbourne In Press) Implicit content and the argument from binding

(Elbourne 2008b) Implicit content and sloppy identity

(Roelofsen 2008) Anaphora Resolved

Additional readings

(Heim and Kratzer 1998) Chapter 11 on E-Type Anaphora (pp. 277-298)


(von Fintel 1999) Quantifier domain selection and Pseudo-scope

(Stanley 2000) Context and logical form

(Stanley and Szabó 2000) On quantifier domain restriction


Readings for Ana Aguilar’s presentation of Florian Schwarz’s work:

Suzi and Masashi’s handout from October 14 (Hashimoto and Lima 2009) and the first two chapters of Florian’s dissertation, (Schwarz 2009). Main content concerns (Schwarz 2008).

1. Overview of the main puzzles to be solved

I’ll annotate these examples with indications of which of the approaches we’ve been discussing has been or can be shown to be able to handle them, and for which they present problems, ideally also noting who has discussed them.
1.1. How are quantifier domains restricted?

The basic cases:

• In matrix sentences:

(1) *Every subject* was asleep.

Annotation: Most proposals have some way of handling this, including the purely pragmatic ones that just limit the universe of discourse.

• Under other quantifiers or operators – ‘bound’ domain restrictions:

(2) *Every time I looked in on an experiment, every subject* was asleep.

Annotation: This example eliminates the purely pragmatic approaches: since the domain restrictor is “bound”, there must be some variable somewhere in the semantics of *every subject* that can be bound by something connected with the previous clause. Both situation-variable and relation-variable could work, associated with *every* or with *student*.

Further issues.

• How (if at all) is the domain-restriction problem connected to the problem of “how many is many?” discussed by Westerståhl (1985), who provides example (3b); (3a) is from (Bennett 1974). I’ve added (3c) to put (3a) in a quantified context.

(3) a. Many men date many women. (possibly: thousands …. dozens)
   b. Sweden is a funny place. *Every tennis player* looks like Bjorn Borg, and more men than women watch tennis on TV. But *most people* really dislike foreign tennis players.
   c. In most Western countries, many men date many women.

I consider this an interesting problem, but we will probably leave it aside, unless it becomes especially relevant to choosing among alternative theories.

• More examples of “dynamic” influence of context on “anaphoric” domain restrictors, from (Gawron 1996):

   b. ? *A harbor seal* in California died last week. Most pups die in the first few weeks of life. (p. 248)

Example (4a) is easy to interpret as “Most Californian harbor seal pups”, but (4b) is somewhat hard to interpret as “Most Californian harbor seal pups” (Gawron’s report). (4b) is probably ok as “Most harbor seal pups”, but Gawron notes that simple indefinites don’t ‘contribute domains’ as easily as real quantificational NPs do. – But why? Is it because the semantics of the first sentence of (4a) involves a tripartite structure with “Operator – Restrictor – Nuclear Scope”, just the same as if it had the adverbial quantifier *rarely* in it, while the first sentence in (4b) has a simple more-or-less atomic structure? (Has anyone studied this explicitly? I don’t know if it would be a good research topic or not.)
An example from (Partee 1993), quoted by Gawron (1996, p.248) to illustrate the
dynamic behavior of quantificational domains. The (a) text sounds natural; in the second
and third sentences, the first conjunct contributes a natural restriction to the ‘travels’ that
are quantified with the adverb of quantification usually.

(5)  a. Henrik likes to travel. He goes to France in the summer and he usually travels by
car. He goes to England for the spring holidays and he usually travels by ferry.
b. Henrik likes to travel. He usually travels by car and he goes to France in the
summer. He usually travels by ferry and he goes to England for the spring
holidays.

The (a) text sounds natural; in the second and third sentences, the first conjunct
contributes a natural restriction to the ‘travels’ that are quantified with the adverb of
quantification usually. But the (b) text sounds contradictory: syntax constrains
accessibility of sources for domain restriction much as for anaphora. (Added note:
probably more like for anaphoric definite descriptions than for pronominal anaphora,
given what we have seen in the meantime. This should be checked – it could be a good
homework exercise.)

Gawron extends the example to illustrate the further interaction of anaphora and domain
restriction: the same material may provide ‘antecedents’ for both:

(6)  a. Every summer Henrik rents a car to go to France. He usually takes it on the
ferry.
b. Second sentence: Usually e, Henrik rents a car x to go to France in summer in e,
Henrik takes x on the ferry in e.

In the formula in (6), the unselective adverb of quantification usually is treated as a
quantifier over events, taking a restrictive clause and a nuclear scope. The restrictive
clause in this case is provided implicitly by the quantification expressed in the previous
sentence: events of Henrik renting a car in the summer to go to France. As Gawron notes
(p.249), the (indirectly) quantified-over cars can then be a “donkey-antecedent” for a
pronoun. This phenomenon is known as quantificational subordination, analogous to
modal subordination as in “A wolf might come in. It would eat you first.” (Landman’s, I
think, also discussed by Roberts and others.) Gawron uses such examples to motivate a
“logic for quantificational domains” involving information states, update functions, and
denotation, building on the work of (Chierchia 1988, Groenendijk and Stokhof 1990,
functions from contexts to contexts, as in Heim’s File Change Semantics; his main
innovation is in splitting contexts into two parts, one part representing an “Environment”
which specifies “alternatives under discussion” and the other part representing
“Information-state”.

I won’t go into details here; his particular proposals have not been widely adopted. But I
mention his work because he not only ties together several aspects of dynamic semantics
but also relates them directly to “sets of alternatives” as in Rooth’s work on focus (Rooth

1 Hmm, has Gawron moved my Henrik from the Netherlands to England?
1985, 1992, 1996) and in recent work at the semantics-pragmatics interface by Roberts (Roberts 1996, 2004) and others (Groenendijk and Roelofsen 2009).

- **Indefinites**: Von Fintel (1999) is concerned with contextual domain selection in connection with the “pseudo-scope” issue (Kratzer 1998), the issue of how “specific indefinites” and “intermediate-scope indefinites” get their interpretations.

We aren’t going into that topic because it’s so big and we already have more than we can really cover. But it’s worth keeping in mind that the very same issues of “Skolem functions”, implicit relational variables, situation arguments, etc., also come up repeatedly in that context. Gawron noted differences between quantifiers and weak indefinites, but there are plenty of ‘strong indefinites’, and there is a rich literature on the typology of indefinites, and much discussion of Skolemized choice functions (Kratzer and Shimoyama 2002, Matthewson 1999, Schlenker 1999, von Fintel 1999, Yanovich 2006). We won’t discuss any of this explicitly here, though. Just one example, from (Schlenker 1999), cited in (von Fintel 1999):

(7) Context: Every student in the syntax class has two weak points – John doesn’t understand Case Theory and LF, Mary has problems with Binding and Theta Theory, etc. Before the final exam, the teacher says:

"If each student makes progress in two (particular) areas, nobody will fail the exam."

On the intended reading, the sentence means that there are two areas per student such that if each student makes progress in the two areas relevant for him/her, nobody will fail.

(8) a. Not captured by Reinhart-style choice functions:

\[ \neq \text{if each (student) } (\lambda x. \exists f(x \text{ makes progress in } f(\text{two areas}))), \text{then nobody fails} \]

\[ \neq \exists f(\text{if each (student) } (\lambda x. x \text{ makes progress in } f(\text{two areas})), \text{then nobody fails}) \]

b. Captured by Kratzer-style Skolemized choice functions.

\[ = \exists f(\text{if each (student) } (\lambda x. x \text{ makes progress in } f_x(\text{two areas})), \text{then nobody fails}) \]

Von Fintel continues with more discussion of Kratzer’s proposal to leave the choice-function variable free, Matthewson’s counter-arguments, etc. He proposes a possible alternative, letting pseudo-scope indefinites involve standard existential quantifiers in situ, but with their domain narrowed in a particular way, so that domain restriction might narrow them to singleton sets – still of the type of normal indefinites, but ‘specific’ via domain restriction.

**1.2. How are definite descriptions (and pronouns) interpreted?**

There is agreement in quite a number of works since (Postal 1966) – including at least Elbourne’s works, (Lyons 1999) (with a lot of cross-linguistic evidence), and (Roelofsen 2008) – that pronouns and definite determiners are basically allomorphs, and that the basic structure for both definite descriptions and pronouns can be represented as follows:
The NP may be overt or null; on Elbourne’s approach there may be an index as part of the NP, perhaps in the form of a property like $\lambda x[x = x_3]$; on some other approaches there may be an index on the D.

**Thumbnails of analyses**

Since many of the puzzling data to be explained have been generated to present problems for one analysis or another, let’s give thumbnail descriptions of the main features of existing competing analyses.

- D-type analyses of pronouns: Reconstruct some sort of content for the ‘missing’ NP part to interpret a pronoun. Early approaches often by ‘syntactic recipe’; more recent approaches more like Cooper’s (1979) analysis: a description built up out of variables whose values should be salient in the context. (I’ll try again to make it show up in the handout, and hope the symbols come out right this time:)

(10) $\lambda K \exists x [\forall y [(\hat{\cdot} \pi] (y) = y = x] \land K(x)].$

where $\pi$ is a property-denoting expression containing only free variables and parentheses.

So $\pi$ can be thought of as the content of the implicit NP. If we wanted to recast Cooper’s analysis as an e-type definite description rather than a generalized quantifier, then it’s (11).

(11) $1 y [(\hat{\cdot} \pi] (y), \text{ where } \pi \text{ is as above.}

Distinctions among D-type analyses include the following:

(a) Syntactic identity condition on the ‘missing NP’ or not – Elbourne requires that at least part of the silent NP is a deleted copy of an antecedent NP. Cooper didn’t, and Roelofsen (2008) argues against including a syntactic identity condition.

(b) Inclusion of a situation-variable as part of the interpretation of the pronoun or definite.

(c) Inclusion of relation-variables and their arguments as part of the interpretation of a pronoun or definite (Skolem-functions).

(d) Constraints and mechanisms – where does the implicit material come from, and how is it constrained? (explicit syntactic and/or semantic rules; accommodation; presupposition; discourse coherence; focus and background “alternatives”; relevance; …)

- Dynamic analyses as in Heim’s Chapter 3: an anaphoric index plus a descriptive condition that should be presupposed to hold. Treats all definites (and pronouns) as anaphoric.
Actually, by the time we’ve been through all the puzzles, I think it’s pretty clear that a pure Heim Chapter 3 theory can’t work. The definites can’t all be a ‘familiar variable’. But variable binding remains a crucial ingredient; we’ll have to try to see whether it remains crucially ‘dynamic’ or not.

**Puzzles and problematic data**

**Puzzle 1: bound definites with implicit bound variables inside**

(12)   a. *Only one class was so bad that no student passed the exam.*
   b. *Only one class x was so bad that no student in x passed x’s exam.*
   c. [only one class] λ₂ [t₂ was so bad that [no R₁ v₂] student passed [the R₃ v₂] exam] (Restricting relation variable on quantifier or determiner; von Fintel)
   d. [only one class] λ₂ [t₂ was so bad that no [student R₁ v₂] passed the [exam R₃ v₂]] (Restricting relation variable on Common Noun; Stanley and Szabó (2000), building on Westerståhl (1985))

Such examples can’t be handled in Heim’s Chapter 3 File Change system, where the definite itself should correspond to a single familiar variable with an associated presupposed condition. But it can be handled with an added relation variable (on the determiner or on the noun; I won’t mention that distinction except where it looks like one of the choices won’t work). A situation variable could also work, introduced and bound by ‘only one class’.

The next batch of puzzles/problems are an inventory presented in Elbourne (2005), primarily for pronouns but many of the apply to definite descriptions as well.

**Puzzle 2: The problem of indistinguishable participants – a problem for D-type.**

(13)   a. If a bishop meets a bishop, he blesses him. (Kamp’s example; (see Heim 1990))

This example presents no problem for Heim’s Chapter 3 theory, since we would have two different variables associated with the two occurrences of a bishop. But it’s a big problem for an approach that gives up the dynamic Kamp/Heim account in favor of analyzing the pronouns as definite descriptions with either implicit NP material to make them unique or a situation variable to make them unique. There doesn’t seem to be anything unique about either bishop. Elbourne discusses many proposed solutions and presents difficulties for all of them until he gets to his own proposal – complicated but not crazy. Situations indispensable, according to Elbourne.

Elbourne’s added variant – a case of indistinguishable participants that really IS bad, but dynamic theories (which have no trouble with indistinguishable participants) would predict to be good:

b. *If a bishop and a bishop meet, he blesses him.* (Elbourne 2005, p. 145)

Also:

c. If a bishop meets a nun, he blesses her. (p. 145)
d. If a bishop and a nun meet, he blesses her. (p. 145) (Elbourne’s solution, using very fine-grained structures of situations, is on pp 146-153.)
Similar problems for definite descriptions. A variant of some examples in (Stockwell et al. 1973):

(14) a. Usually, if a man and a woman meet a man and a woman in a restaurant, the man talks to the man and the woman talks to the woman.
b. *Usually, if a man and a woman and a man and a woman meet, …

**Puzzle 3: The problem of the formal link (anaphoric islands).** Problem for D-type.

(15) a. Every man who has a wife is sitting next to her. (Elbourne 2005, p.12, citing Heim 1982)
b. *Every married man is sitting next to her.

(16) a. Someone who has a guitar should bring it. (Elbourne 2005, p. 64, citing Heim 1982)
b. *?Some guitarist should bring it.

The name “problem of the formal link” comes from (Kadmon 1987) via Heim (1990) to Elbourne (2005, p. 64). For D-type analyses that just reconstruct NP-content according to what is contextually salient, these differences are not predicted. Elbourne’s own theory involves deletion of an NP under identity with an antecedent NP, and thus requires an overt identical antecedent NP. But Roelofsen (2008, p. 122) argues that that condition is too strong, and that the data are more mixed. Examples that point the other way go back as far as (Lakoff and Ross 1972), and Roelofsen has found others.

(17) a. If I get pregnant, I’ll definitely keep it. (Overheard by F.R.)
b. John became a guitarist because he thought that it was a beautiful instrument. (from Lakoff and Ross via Geurts (1999) via Roelofsen 2008)
c. Some men have been married for more than twenty years and still don’t know what her favorite breakfast is. (Roelofsen, invented)
d. If you don’t know what his favorite movie is, you should plan to find out and watch it with him at the earliest convenience. (Roelofsen; found on a website “The Real Keys to a Happy Marriage”, with no occurrence of the word husband)

See Roelofsen (2008), Chapter 5, for arguments concerning both pronouns and definite descriptions and related arguments concerning VP-deletion, arguing that there is in fact no requirement of a formal link, that counterexamples are easiest in contexts expressing causal relations, and that what constraints there are are rather a matter of discourse coherence, information structure, and other interacting factors.

**Puzzle 4: The problem of “pronounal ambiguity”, i.e. wanting a “uniform” analysis. Problem for “old” D-type.**

A D-type analysis like that of Heim (1990) makes pronouns ambiguous: sometimes they are simply variables (bound variable pronouns and deictic ‘free variable’ pronouns) and sometimes they are definite descriptions, and on such early D-type analyses, there was no
resemblance between the two. This is not a ‘data’ puzzle but a theoretical desideratum. If a satisfactory unified analysis can be found, it would be preferable. And if these “two kinds” of pronouns have the same form in language after language, then a unified treatment would be strongly preferable. Elbourne unifies them, as we’ve seen: the variables are converted into properties like \( \lambda y [y = x_i] \), which can be implicit ingredients of the reconstructed NP part of a DP. Others make basically the same move, so that the D-type analysis can cover the cases that were formerly pronouns as variables.

Once that move is made, then a modern D-type analysis has an advantage over the dynamic theory, which can’t as easily be amended to assimilate D-type pronouns.

**Puzzle 5, for dynamic theories: Disjunctive antecedents.**

Example (18) is from (Stone 1992).

(18) If Mary hasn’t seen John lately, or Ann misses Bill, she calls him. (Elbourne p. 19)

The D-type analysis can handle this with definite descriptions *the man*, *the woman*, and a judicious use of situation variables over minimal situations. [Note: the D-type analysis goes very naturally together with the use of situation variables to provide small enough domains to guarantee uniqueness.]

**Puzzle 6, for dynamic theories: “Deep anaphora” – no linguistic antecedent.**

Jacobson (2000) has example (19), involving a “paycheck pronoun” with no linguistic antecedent.

(19) *A new faculty member picks up her first paycheck from her mailbox. Waving it in the air, she says to a colleague: Do most faculty members deposit it in the Credit Union?* (Elbourne p. 20)

Pronouns without linguistic antecedents are familiar enough, often assimilated (probably mistakenly) to deictic pronouns. Heim speaks of a dog that walks into a room, becomes salient, and causes a new card to be added to the file. The problem here is that all the context would trigger would be the addition of a file card for the particular paycheck that’s being waved in the air, and that isn’t what the *it* is referring to. There’s no obvious way in a dynamic theory to get the reading ‘the paycheck of x’ with x bound by ‘most faculty members’.

**Puzzle 7, for dynamic theories: “Neontological Pronouns”.**

Elbourne (2005) invented the term “neontological pronouns” for a certain class of problematic paycheck pronouns and pronouns of laziness, ones in which the pronoun introduces an entity that is ‘new’ in the sentence (Elbourne p.21).

(20) a. John gave his paycheck to his mistress. Everybody else put *it* in the bank.  
   b. This year the president is a Republican. Next year *he* will be a Democrat.
On dynamic theories, pronouns are translated as individual variables, but that cannot work for these examples. D-type analyses do well with these. Elbourne (2005) discusses two solutions to paycheck sentences (pp 81-83). The most widely proposed solution is a D-type one, going back to Cooper (1979): analyze it as ‘the paycheck of x’. (For Cooper, it wasn’t the syntactic item ‘paycheck’, but a relation-type variable getting ‘paycheck-of’ as a value salient in the context.) Elbourne also explores a variant that uses a situation variable rather than a relation variable, accommodating the assumption that we are quantifying over minimal situations in which there is one paycheck per faculty member, and supposes that it could also work. (Elbourne notes that the most natural definite description paraphrase is his paycheck, so the example needs attention to possessive pronouns and whether or not they can be analyzed as the paycheck of him so that the needed bound variable is inside the common noun phrase.)

Puzzle 8: Weak and Strong readings of donkey sentences.

Elbourne (2005, 22-23) discusses Chierchia’s defense of including both dynamic binding and D-type pronouns on the grounds that allowing for the two different mechanisms for interpreting pronouns can account for the existence of both weak and strong readings of donkey pronouns, as in (21a-b).

(21) a. If a farmer owns a donkey, he deducts it from his taxes. (strong, or $\forall$-reading)  
b. Everyone who had a dime put it in the meter. (weak, or $\exists$-reading)

Chierchia assumes that a D-type analysis cannot generate the weak readings, since a definite description would presuppose uniqueness (e.g. by restricting to minimal situations that contain one person and one dime, hence quantifying over all such situations.) But Elbourne notes if it in (21b) is replaced by a definite description, we still get a weak reading.

(22) Everyone who had a dime put the dime in the meter. (weak)

Hence the problem is not with the D-type analysis per se but with the interpretation of the posited definite description. Elbourne does not try to solve the problem of how exactly to analyze such definites (he suggests that it requires not always quantifying over strictly minimal situations, though doing so was crucial for other examples).

That’s the end of Elbourne’s initial list of puzzles, all centered on donkey sentences and donkey pronouns. Other authors have of course brought up lots more puzzles about definites and pronouns. We discussed a number of Elbourne’s more recent proposals – with new examples -- and his own debates between ‘doing it all with situations’ and using ‘relational variables’ in Week 1 and Week 6.

2. Do we need all three ingredients – implicit NP, relation variables, situation variables?

From this (certainly incomplete) review of puzzles and problems, it seems to me that the parts that look most well-established are:

(i) the unification of definite articles and pronouns as variants of the same morpheme;
(ii) a Cooper-like version of the D-type analysis of pronouns, with a property-type expression reconstructed (using salient linguistic and non-linguistic context, much discussion still needed about strategies and constraints) corresponding to the missing “NP” part in the case of the pronouns (here I am siding with Roelofsen against Elbourne, but I don’t consider the matter really settled);

(iii) accommodation of similar ingredients in definite descriptions that do have a non-null but ‘incomplete’ DP;

(iv) the idea that one of the accommodated ingredients can be a Skolem-function – a relation variable with its argument(s);

(v) the idea that all sorts of constituents, not just definite descriptions and quantifier phrases, include a situation variable (probably as an argument, much as world-arguments were automatically provided for all constants in a Ty2 version of intensional logic (Gallin 1975).

But is this too rich a theoretical arsenal? Discussion to be continued …

References


https://udrive.oit.umass.edu/partee/Semantics_Readings/Heim%26Kratzer.pdf.


Kadmon, Nirit. 1987. On Unique and Non-Unique Reference and Asymmetric Quantification, Linguistics, University of Massachusetts: Ph.D.


http://semanticsarchive.net/Archive/DFjNjM5M

http://semanticsarchive.net/Archive/WEwNj4Z/


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