

Economy and Intermediate Accommodation*

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1. Every man loves his wife
= Every man who is married loves his wife
 2. Either John never smoked or (if he lives in New York he has stopped smoking)
= Either John never smoked or (he used to smoke and if he lives in New York, he has stopped smoking)
- both of the above examples generate readings that can be explained by something like ‘intermediate accommodation’ i.e. accommodation of an embedded sentence’s presupposed information into a context that is neither the global context itself (i.e. as if adding the information at the root node), nor the local context of the embedded sentence (i.e. as if adding the information to the sentence itself)
 - the existence, or lack, of intermediate accommodation has important consequences for theories of presupposition
 - some theories (eg. Heim [16], van der Sandt [19], Geurts [14]) allow for the existence of such readings (in fact, in some structures, DRT approaches prefer this reading out of a set of possible readings)

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- other theories (eg. Beaver [1], Schlenker [20]) do not allow for such readings
- prima facie, (1) and (2) seem to support the existence of intermediate accommodation
- cases like (2) have rarely been discussed
- cases like (1) have been
- presupposition in quantified sentences is complicated by (at least) the following factors: (i) the possibility of domain restriction (Beaver [1, 2], von Stechow [9, 10]), (ii) the existence of proviso problems, i.e. the possibility of generated strengthened meanings from weak presuppositions, (iii) the lack of empirical data collection on presupposition in quantified sentences, though see Chemla [5], (iv) given the proviso problem, it is not clear whether Chemla's results were getting at 'the presuppositions' of sentences like (1), or just preferred readings
- will examine the status of 'intermediate accommodation,' mostly through facts concerning presupposition in quantified sentences, though will also look at conditionals
- what do quantified sentences like (1) presuppose?
- Heim [16], Schlenker [20]: universal presupposition, every man has a wife
- Beaver [1]: existential presupposition, some man has a wife
- DRT (van der Sandt [19], Geurts [14]): depends on the quantifier, preference for 'intermediate accommodation,' i.e. every man who has a wife loves her

Questions Addressed (i) Given the existence of proviso problems (Geurts [13]), we don't know whether Chemla's results were getting at preferences, or actual meanings, (ii) Can we find evidence for or against intermediate accommodation?

Conclusions Drawn (i) Chemla's results were getting at preferences, i.e. the presuppositions of quantified sentences are, in most cases, weaker than what the preferred readings end up being, (ii) Intermediate accommodation does indeed sometimes exist, but not always

1 Domain Restriction

- we know natural language quantification is restricted, both formally (in the sense of being *conservative* (van Benthem [3])), but also that their domains are contextually restricted
- Beaver [1, 2], von Stechow [9, 10]: the intermediate reading observed above is not a matter of intermediate accommodation, but rather contextual domain restriction
- if we make the restrictor heavy enough, say, by adding a relative clause, domain restriction effects seem to go away
- Schlenker [20], Chemla [5] also suggest making domain explicit to eliminate domain restriction effects

3. Every man who works for Company X loves his wife

- if intermediate accommodation were available, it should be possible to read (3) as true in a domain where seven men work for Company X, five are married, all five love their wives
- no one assents to the truth of (3) in this context
- but, sometimes, if people squint hard enough, and are in a particularly charitable mood, they might attribute truthful, cooperative speech to a speaker who utters (3) (especially after being shown (35)-(38) in Section 4.1.2)
- eg. someone charged in a court of law for lying by uttering (3) in this context might defend herself as follows: ‘Look, I simply meant that every man in the company who is married loves his wife’
- it’s a bit of a stretch, and one could only look with contempt or pity (or both) at such a person, but it is not obvious that such a defense would be unsuccessful
- so, still not removed from issue of domain restriction

2 Assertability Constraints

- need diagnostics that are more stable than truth-conditional judgments, which are notoriously difficult to reliably make
- eg. the following have all been noted as ‘paradoxical,’ partly because truth-value judgments are just really difficult to make
 4. Paradoxes of material implication: $\# p. \text{ Therefore, if } q, \text{ then } p$
 5. Moore’s Paradox: $\# p \text{ and } I \text{ don't know that } p$
 6. Gibbard Phenomena: $\# \text{ if } A \text{ didn't do it, } B \text{ did, and if } A \text{ didn't do it, } C \text{ did}$ (in a context where it is known that only one of A, B, C did it)
 7. etc.
- Grice [15], Lewis [17]: a theory of assertability should account for such strange assertions
- assertability constraints (Singh [21], following van der Sandt [19], Geurts [14])
- impose constraints that have generally been thought to apply at the global pragmatic level locally within the semantics (dynamically, at each execution of a sub-sentence’s CCP)
- basic idea: each constituent sentence, in its local context, must be ‘doing something,’ i.e. must be locally informative (removing worlds from the context set), must be locally consistent (not leading locally to an empty set), and must be locally defined (its presuppositions must be met in the local context)
- the latter constraint is the foundational idea in dynamic semantics (Heim [16])
- call a sentence *assertable* iff the local constraints are everywhere met
- the oddness of the above sentences can be derived by showing that they are unassertable (see Singh [21] for details)

- but then, what goes wrong in (9), (11)? and why are their slight variants, (10), (12), felicitous?
8. # It's raining and I don't know it (Moore's paradox)
 9. # It might be raining and it is raining
 10. It might be raining. In fact, it is raining
 11. # At least three men who work for Company X are married and all of them are
 12. At least three men who work for Company X are married. In fact, all of them are

Implicature Generation and Cancellation (1) Implicature computation is obligatory (see also Magri [18]), (2) Implicatures can only be cancelled explicitly

Corollary One cannot cancel implicatures via accommodation (see also Gazdar [12], Geurts [14])

13. # John might have a son. In fact, I saw his son at Harvest Co-op the other day.
 - now, let's get back to our quantified sentences
14. # At least three men who work for Company X are married. In fact, every man who works for Company X loves his wife
 - three stories about the above
 - global accommodation (Heim, Schlenker): global accommodation of *every man is married*
 - local accommodation (Heim, DRT, Schlenker): accommodation of x_i *is married to x_i loves x_i 's wife*¹

¹Note that, although we have here a case of local accommodation, it is also, in other ways, global accommodation, in the sense that the information that was added as a result of local accommodation ends up in the context for good. See also the discussion of indefinites at the end of Heim [16].

- intermediate accommodation (Heim, DRT) of *x_i is married to x_i a man*
 - if the second sentence of (14) came with an intermediate accommodation reading, should be a way of interpreting it without cancelling the ignorance implicature
 - the oddness suggests that there is no intermediate accommodation here
 - note that the oddness cannot follow from some constraint that might rule out sequences of sentences where a sentence is followed by one that asymmetrically entails it, as the following shows, as would any standard case of presupposition cancellation in conjunctive sentences
15. At least three men who work for Company X are married. In fact, every man who works for Company X is happily married

3 Meanings, Preferences, and the Proviso Problem

16. No man who works for Company X loves his wife
- Heim, Schlenker: every man who works for Company X is married
 - DRT: no such reading available – only local or intermediate, which doesn't entail anything about anyone being married
 - Beaver: some man who works for Company X is married
17. At least three men who work for Company X are married. Moreover, no man who works for Company X loves his wife
- the felicity of this sequence teaches us that *no man who works for Company X loves his wife* need not be read with a universal presupposition
 - a local/intermediate accommodation story can account for this
 - two ways of going, it seems

3.1 Universal Presuppositions

- can say prediction of universal presupposition is correct, but that whenever forced, local accommodation can kick in to save you
- but then, why so often not get universal reading?
- eg. Chemla's results suggest, as do my own informal surveys, that most quantifiers are not read with a universal reading (eg. *exactly three*, *at most three*, *at least three*)
- with some, it's not even really thinkable, eg. Irene's *A fat man was pushing his bicycle*
- independent, to some extent, of whether intermediate accommodation is allowed or not

3.2 No Global, only Local/Intermediate

- overwhelmingly, a purely local accommodation reading gets the right result (i.e. gets at the right reading the sentence has when all is said and done)
- but that would predict, eg. that (16) can be read without any commitment to any man being married, i.e. as *no man who works for Company X is such that he's married and loves his wife*
- this seems to be a correct prediction

Context:² You work for an investment firm. The boss is thinking of investing in Company X. She puts you in charge of the decision making. She leaves you the following instruction:

18. If no man who works for Company X loves his wife, invest
19. If none of the seven men who work for Company X love their wives, invest

²Constructed with Roni Katzir, in ongoing joint work.

You investigate and you learn that Company X has a policy, stating that men who are married and love their wives must leave by 5pm; bachelors, and men who do not care about their wives, must stay until very late, at least 8pm. You set up shop outside Company X at 5pm and, sure enough, no man leaves. What do you do? You probably wouldn't last very long in the firm if you did not invest.

- the behaviour of the other quantifiers with respect to our diagnostics, as well as Emmanuel's results, suggest that a local accommodation reading seems to be all that is really needed, perhaps even preferred (as with indefinites, etc)
- is an architectural choice point in Heim: we do not need to ask, what a sentence presupposes
- all that is *really* required is that every update be everywhere defined (more on this below, under the section headed 'Intermediate Accommodation')
- but then: why the preference to read (16) with a universal presupposition?
- perhaps an instance of the proviso problem
- one idea: by the very semantics of *no*, you need to check each member of the domain in order to verify the sentence as true/false
- perhaps this imposes the universal requirement, somehow
- but not extend to other such quantifiers

20. Exactly three men who work for Company X love their wives

- will have more thoughts on how to generate such a reading a bit later (constructivism)

3.3 Intermediate Accommodation

- suppose we don't allow ourselves to ask the question, in Heim's framework, what it is that a sentence presupposes

- instead, we simply require local satisfaction, and where this is not met, we find some context where we can accommodate so as to ensure local satisfaction
 - Heim was the first to observe a systematic ambiguity about *where* you accommodate, i.e. local versus global accommodation
 - let $c[\text{there is a king of France}] = c'$
 21. $c[\text{The king of France isn't bald}]$
 22. GA: $c' - c'[\text{the king of France is bald}]$
 23. LA: $c - c'[\text{the king of France is bald}]$
 - now, there are only two contexts here, the local context, and the global one
 - is it just an accident of the example that we talk only about local/global? i.e. if there were more contexts, would local/global still be the only options, or would other intermediate contexts also count?
 - Heim [16] doesn't force us one way or another, but, in the absence of any arguments otherwise, one would expect that any context should suffice
 - DRT systems indeed take this route, and define a notion of accessibility of contexts, allowing more than simply the local/global options
 - note that, it is clear that allowing *only* local/global will not do, for we do find instances of intermediate accommodation, as we saw in (2)
24. If John_{*i*} is a scuba diver, Mary believes he_{*i*} will bring his_{*i*} wetsuit
IA Reading = If John is a scuba diver, he has a wetsuit and Mary believes he will bring it
 25. If John is shaking, Mary believes that he has stopped smoking
IA Reading = If John is shaking, he used to smoke and believes he has stopped

26. Either John never smoked or Mary believes that he has stopped smoking
 IA Reading = Either John never smoked or he used to smoke and Mary believes that he has stopped
- thus, in general, we don't want to rule out intermediate accommodation entirely
 - however, DRT, and sometimes Heim, systematically predict cases of intermediate accommodation that are simply unattested
 - one is presupposition in quantified sentences
 - I'll enumerate two more here, having to do with conditional sentences

3.3.1 Intermediate Readings in Conditionals

- we know that conditionals 'if ϕ , then $\psi\{X\}$ ' can have both a local, and global, reading (cf. the proviso problem)
27. If John is a scuba diver, he'll bring his wetsuit
28. if John flies to Toronto, his sister will pick him up from the airport
- an intermediate accommodation reading would condition on the presupposition, as in *if John has a sister and flies to Toronto, his sister will pick him up from the airport*, or *if John is a scuba diver and has a wetsuit, then he'll bring his wetsuit*
 - such a reading in conditionals is unattested (eg. Beaver [1])

3.3.2 Presuppositions and Pronouns

- DRT systems (eg. van der Sandt [19], Geurts [14]), and OT variants (eg. Blutner [4]), are based on an intuition, and formal procedure, that tightly links presuppositions and pronouns
- they both predict, eg. that (29) and (30) should both be felicitous in a context where John has three wives (see Singh [22])³

³Situation semantics approaches would also make this problematic prediction.

29. If John is married to an American, she must be a great cook
30. #If John is married to an American, his wife must be a great cook
- this points in general to a problem with linking presuppositions and pronouns too tightly
 - for DRT approaches, the main difference between typical presupposition triggers and pronouns is that the former have more descriptive content, hence allow for greater accommodation
 - the existence of the reverse, i.e. easier accommodation for pronouns than presuppositions would be surprising
 - but this is quite robust, in general
31. A linguist walked in. She put her briefcase down on the table.
32. A linguist walked in. #The woman put her briefcase down on the table.

4 Ruling Out Intermediate Accommodation

4.1 Economy and Intermediate Accommodation

- following Dalrymple et al. [8] on reciprocals, Blutner [4] on presupposition projection, Winter on plural predication, Chierchia [6] and Chierchia, Fox, and Spector [7] on implicatures, suggest that accommodation is governed by something like a ‘strongest meaning hypothesis’

Strongest Meaning Hypothesis Out of a set of possible contexts for accommodation (given by the CCP), select that context c' such that accommodation into c' results in the (logically) strongest output context

Corollary 1 In conditionals, only global accommodation should exist

Corollary 2 In quantified sentences, only local accommodation should exist

4.1.1 Economy and Conditionals

- sticking with the SMH, what do we make of the prediction that there should be only global accommodation in conditionals, given the existence of local accommodation (eg. *If John's a scuba diver, he'll bring his wetsuit*)
 - perhaps, in such cases, there is no accommodation
 - under, eg. the Stalnaker [23] analysis of indicative conditionals, there wouldn't be presupposition failure here
 - the context supports certain lawlike statements, such as *scubadivers have wetsuits, etc.*
33. If John is a kabaddi player, he'll bring his chappal
- global or not?
 - if global, then John has a chappal
 - if not, then local
 - but how to make sense of a speech act where local, but not global?
 - if kabaddi players have wetsuits
 - predict a peculiar kind of ambiguity, which seems to be attested
 - alternatively, can make use of Revised Economy Condition (see below, under heading 'Economy and Quantification'), which accounts nicely for the attested readings (local/global), as well as for this particular kind of ambiguity
 - but here, as opposed to the case of quantifiers, the local reading is NOT, in general, preferred
 - don't want to press the point too much – processing experiments may help here, in particular, ERPs

4.1.2 Economy and Quantification

- predictions: (i) no way to tell in symmetric quantifiers, (ii) in quantifiers like *most*, should find availability of both local and intermediate, with no preference for either, (iii) preferences should flip in DE contexts

Context: Seven men work for Company X, five are married, all five love their wives.

34. #Every man who works for Company X loves his wife
 35. (?)If every man who works for Company X loves his wife, invest
 36. (?)Not every man who works for Company X loves his wife
 37. (?)I doubt that every man who works for Company X loves his wife
 38. (?)Most men who work for Company X love their wives
- also, can use our implicature-accommodation constraint
39. #At least three men who work for Company X are married. Moreover, every man who works for Company X loves his wife
 40. At least three men who work for Company X are married. Moreover, I doubt that every man who works for Company X loves his wife.
- the above contrasts are surprising from the point of view of the DRT algorithm
 - the availability of intermediate accommodation seems to be tied to monotonicity
 - but: preferences don't simply 'switch'
 - rather, it seems as though local is still strongly preferred, and intermediate becomes possible if it doesn't weaken the local reading

Revised Economy Condition Accommodation into context c' is possibly only if it doesn't weaken the reading generated by local accommodation. Preference is still for stronger meanings (in a weaker sense of 'preference', now)

- BUT: many problems with above diagnostics
- first: negation itself is quite confusing
- second, it is not clear that the antecedent of conditionals is a DE environment
- third, it is not clear that *doubt* is DE
- the only clear datum in the above is the felicity of (40), so let's examine that in greater detail

Context: You know that there is no German Shepherd here, and you are quite sure that there are no poodles or pitbulls here. Suppose these are the only kinds of dogs there are.

41. I doubt that there is a dog here.
42. #I doubt that there is a German Shepherd here.
- it is generally assumed that $D\phi$ entails $\neg B\phi$
 - but what about the inference from $D\phi$ to $\neg B(\neg\phi)$?
43. # I believe it's not raining. Therefore, I doubt that it's raining.
- $[[D_\alpha(\phi)]]$ entails $[[\neg(B_\alpha(\phi)) \wedge \neg(B_\alpha(\neg\phi))]]$ ⁴
 - if so, then *doubt* is no longer DE,⁵ but it can be used to help us rule out an intermediate accommodation reading
44. I doubt that every man who works for Company X loves his wife
45. IA: I don't believe that every married man in Company X loves his wife, and I consider it possible that every married man in Company X loves his wife
46. LA: I don't believe that every man in Company X is married and loves his wife, and I consider it possible that every man in Company X is married and loves his wife

⁴Either as a matter of 'basic meaning' or meaning 'strengthened' by implicature.

⁵As the reader can easily show by constructing an appropriate model.

- under this analysis, the felicity of (40) is accounted for, and it is predicted to be felicitous on both the intermediate and local reading
 - however, that is because there is no conflict in either of these readings with the speaker's ignorance of whether every man in Company X is married
 - if we make it so that the speaker knows that only five of the men who work for Company X are married, the local accommodation reading will be inconsistent with this information (because the speaker can't consider it possible that every man in Company X is married and loves his wife, since he knows that at least some of the men in Company X are not married at all)
 - however, the intermediate reading will remain consistent
 - thus, if in such a context, the sentence is felicitous, it is evidence for IA; if not, then it is evidence against
47. # Exactly five men who work for Company X are married. Moreover/However, I doubt that every man who works for Company X loves his wife.
- this seems to be solid evidence against intermediate accommodation
 - the apparent availability of intermediate accommodation in (35)-(38) will thus have to be explained away, perhaps due to the easier availability of domain restriction
 - but why should the ease of domain restriction be sensitive to the monotonicity of the environment?

4.2 No Escape from Syntax

6

- we've seen that local and global are both available, as are some intermediate positions

⁶This section derives from collaborative speculation with Roni Katzir.

- the intermediate sites that seem to be available seem to be governed by syntax, namely, one can accommodate into any containing sentence
- one option: add the material to any S node upwards
- would rule out intermediate readings in the cases of interest, and would allow it in others
- would also predict, eg. that in disjunction, could get both local and global, but nothing else
 32. John either just started smoking or just stopped
 33. Either John's brother will come with him or his sister will
 34. Either the king of France is bald or there is no king of France
- but this raises the question: if, eg. *No man who works for Company X loves his wife* is semantically given the reading 'No man who works for Company X is married and loves his wife,' why does this sentence seem to be read as 'every man who works for Company X is married and no man who works for Company X loves his wife?'

5 Tentative Conclusions

- the Heim system of local satisfaction is correct, supplemented by a theory of accommodation
- this theory must have access to intermediate contexts, but not all intermediate contexts allowed by the CCP
- rather, the set of potential accommodation sites are precisely those sentences containing the sentence that hosts the trigger
- will still need to motivate preference for higher attachment, perhaps governed by SMH
- much evidence against the DRT binding/accommodation algorithm
- theories that admit of universal presuppositions need to account for their systematic absence in many cases, as well as the existence of some cases of intermediate accommodation

- a theory of the sort tentatively put forth here needs to account for why, eg. *No man who works for Company X loves his wife* is most happily read with a universal presupposition
- it also needs to distinguish somehow entailments that are asserted, from entailments that come about through ‘local accommodation’
- I provide, in the appendix, a system in classical, first-order logic that captures what the effects of accommodation at some site are, in terms of presuppositional commitments
- quantify over continuations, in a manner similar to Schlenker [20], but existentially quantify over continuations that result in truth
- the notion of constructive proof/verification therefore becomes relevant (see also Barwise and Cooper, Fox [11])

6 Appendix

6.1 Context Change Potentials

$$\begin{aligned}
c[\neg\phi] &= c - c[\phi] \\
c[\phi \wedge \psi] &= c[\phi][\psi] \\
c[\phi \vee \psi] &= c[\phi] \cup c[\psi]^7 \\
c[\phi \rightarrow \psi] &= c - (c[\phi] - c[\phi][\psi])
\end{aligned}$$

For any world w , where R_α is the accessibility relation for agent α , let $Dox_\alpha(w) = \{w' \in W : wR_\alpha w'\}$. Let ‘B’ stand for *believe*, and ‘D’ for *doubt*.

$$c[B_\alpha(\phi)] = \{w \in c : Dox_\alpha(w)[\phi] = Dox_\alpha(w)\}$$

$$[[D_\alpha(\phi)]] = [[\neg[B_\alpha(\phi)]]] \wedge [[\neg[B_\alpha(\neg\phi)]]]$$

Prediction: $\lceil D_\alpha(\phi\{X\}) \rceil$ presupposes $B_\alpha(X)$.

John doubts that Bill’s sister will be at the party

John mistakenly believes that Bill has a sister, and he doubts that Bill’s sister will be at the party

⁷Perhaps to be revised.

$c[Qx_i, Ax_i, Bx_i] = \{ \langle g, w \rangle \in c : \text{for } Q \text{ individuals } a \text{ in } D_e, \text{ if } \langle g^{i/a} \rangle \in c[Ax_i], \text{ then } \langle g^{i/a} \rangle \in c[Ax_i][Bx_i] \}$

6.2 Local Satisfaction

Each update operation $[P]$ specified by a CCP, where P a predicate or formula, must be defined in its local context.

Where c is a context (set of worlds or world-assignment pairs), P a predicate or formula, P presupposes R , then $c[P]$ is defined iff $c[R] = c$.

6.3 Presupposition Accommodation

Candidates for Accommodation Accommodate by adjoining presupposed material to any S node upwards.

Predictions:

Conditionals: Accommodation Possibilities: Local and Global

Quantifiers: Accommodation Possibilities: Local

Constraint Against Accommodation You cannot cancel implicatures via accommodation.

Can compute the effect of accommodation at a particular context in first-order, classical logic, as follows.

Let $S = [\dots [\phi(\{X\})] \dots]$, context c to be updated by S .

Let $S' = S[X \wedge R/R]$ for some (open or closed) formula R embedded in S , R of same type as X , such that update of context c with S' is defined.

Then S' imposes the following commitment generated through this kind of accommodation:

$\exists T(S'[T/R])$

Example: Local accommodation in quantified sentences $Qx, Ax, Bx\{Xx\}$ generates commitment *At least* Qx, Ax, Xx . This will be the sentence's presupposition. However, doesn't answer the question of why, when the presupposition is weaker (eg. *No A is an X*), the reading is universal (eg. *Every A is an X*)

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