“Now that you mention it…”
Dynamic attention to possibilities

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These are the slides for a talk I gave at the LeGO (our internal colloquium series for the ILLC members at the philosophy department). The slides were written to be accompanied by a talk; I wrote the notes somewhat later so I could distribute the slides without worrying that people would be completely confused as to my point. (If anyone still is, at least I tried.)
Evolution of an idea

Dec ’07  *The relevance of awareness* (Franke & de Jager) Amsterdam Colloquium

May ’08  *Now that you mention it: Awareness dynamics in discourse and decisions* (Franke & de Jager) under review

Sep ’08  ‘*Now that you mention it...*: Attending, or not, to possibilities’ NAP-dag talk

Today  ‘*Now that you mention it...*: Dynamic attention to possibilities’

Oct ’09?  Dissertation defence?

The idea comes from “awareness models” from the economics and rational choice literature [FH88; HMS06]. Michael Franke and I applied a variant of this notion to formal pragmatics for the Amsterdam Colloquium 2007 and wrote a paper together, and I’ve taken it on from there.
Abstract

It is an obvious truism that we do not, in daily life, attend to all conceivable possibilities. The truism finds its way into our semantics, in a sense, whenever we fix a set of possible worlds: those are the possibilities we attend to, and all others are inconceivable. We might think of this as nothing more than an abstraction that makes models easy to draw (in which case 'really' there is a huge, possibly infinite, set of possible worlds supporting any natural language assertion). Or we might consider it a reasonable representation of a particular instance of conversation (or belief, or reasoning), for which all relevant possibilities are represented. In either case, though, the picture is essentially static.

The focus of this talk, and of my dissertation, is the suggestion that we take this truism seriously. Because the set of possibilities being attended to is not, it turns out, a static background against which we can do our semantics and pragmatics. It is again intuitively a truism that we can shift our focus of attention to take in new possibilities, but this truism sits much less comfortably with a conventional semantics, when 'possibilities' are taken to be something like possible worlds. Even dynamic semantics is static in this particular sense (a more polemical title for this talk could be "Dynamic semantics made dynamic").

The immediate reaction to this suggestion might be, “Sure that’s how we should do it, but what does all that extra work gain us?” I have three kinds of answer. The first is, it solves problems. I’ll show a range of examples where this kind of analysis makes life simpler: the pragmatics of possibility statements, a proper analysis of Sobel sequences (and related phenomena), standards of precision for vague predicates, and the semantics of knowledge ascriptions (aka the skeptic’s argument against the possibility of knowledge). The schema in each case is very similar: building attention to possibilities into the structures that we do semantics with lets us keep the semantics themselves simple, while delivering the (sometimes complex) dynamic (and, I argue, often pragmatic) effects we’re looking for.

The second kind of answer is: having to do it properly forces us to do it properly. In order to represent attentiveness correctly we have to be very explicit about who is doing the attending; there are two non-equivalent ways to exclude worlds, by ruling the out or by not attending to them, and they interact in interesting ways. This means we also have to be very explicit about just what is represented by our sets of possible worlds: some particular agent’s belief state, or the common ground, or someone’s beliefs about the common ground, or what? I will argue that this clarity is beneficial, among other things in forcing us to think carefully about the status of our linguistic intuitions of acceptability.

The third kind of answer is, it’s fun! This framework seems to work for some pretty wild and crazy looking dialogues. It also means we need to keep our eyes open for some pretty wild and crazy update possibilities (attending to a new possibility might in principle throw into doubt every assertion that has been accepted so far in a conversation). And secretly I suspect that that kind of fun also points at something else: it might just be correct.

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Outline

1. Intuitions
2. Details
3. Applications
   - Sobel sequences
   - Vagueness and standards of precision
   - Pragmatics of possibility statements

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How we introduce a logic

- Propositional language: \( p, q, r, \ldots \)
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- Extra bits and pieces: \( \Box \)
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A model

\[
\begin{array}{cccc}
00 & 01 & & \\
& & \rightarrow & \\
10 & 11 & & \\
\end{array}
\]

...where are \( r, s, t, \ldots \)?

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An experiment

I covered my face with a piece of paper and asked the audience whether I was wearing my spectacles or my contact lenses. A calculated risk, which paid off: Maria (bless her heart) couldn’t remember.

Trying to motivate a distinction between conscious, considered belief (difficult to lose due to inattention) and unconscious assumption (easily lost or at least brought into question).
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Stalnaker on belief, presupposition

- Instead of *sets of sentences* (representing beliefs, common ground, whatever)...
- ... *sets of possible worlds*.
- Pragmatic presupposition: held by speaker
- Linguistic presupposition: required by sentence

A brief introduction to Stalnaker’s model (it belongs of course to many others, but it’s his ideas that I’m primarily building on). I mention his unusual definition of “presupposition” because it turns up in quotes later; also because his use of the term nicely elides the difference between conscious beliefs and unconscious assumptions.
Presuppositions that might not be beliefs

Stalnaker

To presuppose a proposition in the pragmatic sense is to take its truth for granted, and to assume that others involved in the context do the same. This does not imply that the person need have any particular mental attitude toward the proposition, or that he need assume anything about the mental attitudes of others in the context. Presuppositions are probably best viewed as complex dispositions which are manifested in linguistic behavior.

(Context and Content pg. 38)

Or, beliefs that need not be represented in the mind of the believer. (NB: if you ask about them, they will become represented.)

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“The Bijenkorf is larger than Frege’s left earlobe.”

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More interesting than the case of propositions believed but too obvious to be noticed are those propositions taken for granted only because they are not noticed.

(Inquiry pg. 69)

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The next slide gives examples of propositions taken for granted only because they are not noticed.
Some riddles

Q What is brown and sticky?

If any of these riddles ‘work’ for you, you should get an “Aha!” moment, a *click*, when you realise what assumption you have to overturn in order to see the right answer.
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Q What is brown and sticky?
A A stick.

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Stalnaker again

Difficult problems are sometimes difficult only because the alternative solutions from among which one is trying to select the correct one does not include the correct. One has beliefs, or presuppositions, which exclude the correct answer. (Inquiry pg. 69)

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- Possible worlds semantics: either know, know not, or uncertain about $\varphi$

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We call unconscious beliefs “assumptions”; they’re often not based on immediate evidence, and thus can easily be wrong.

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- Which possibilities do we attend to?

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“Elusive Knowledge” (Lewis ’96)

- Infallible knowledge vs. the sceptic

Lewis’ proposal [Lew96] is very similar to mine, except that he’s doing hard-core epistemology. He wants normative standards for knowledge attribution; I want to describe how peoples beliefs change under changes in attentiveness. He focusses on the “every” in the definition; typically natural language universals have an implicitly restricted domain. What’s the right implicit restriction here?

Stupidity: if you are too dull to imagine many far-fetched possibilities, your knowledge is more stable. Doing epistemology can destroy your knowledge!
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- "[...] except for those possibilities that we are properly ignoring."

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- “If you claim that S knows P, and yet you grant that S cannot eliminate a certain possibility in which not-P, it certainly seems as if you have granted that S does not after all know that P.”
- “Subject S knows proposition P iff [...] P holds in every possibility left uneliminated by S’s evidence.”
- “[...] except for those possibilities that we are properly ignoring.”
- “Knowing” is context-sensitive

Lewis’ proposal [Lew96] is very similar to mine, except that he’s doing hard-core epistemology. He wants normative standards for knowledge attribution; I want to describe how peoples beliefs change under changes in attentiveness.
He focusses on the “every” in the definition; typically natural language universals have an implicitly restricted domain. What’s the right implicit restriction here?
Stupidity: if you are too dull to imagine many far-fetched possibilities, your knowledge is more stable. Doing epistemology can destroy your knowledge!
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2. Details

3. Applications
   - Sobel sequences
   - Vagueness and standards of precision
   - Pragmatics of possibility statements

Tikitu de Jager (ILLC) "Now that you mention it..." LeGO 10/08 13 / 36

"Now that you mention it..."
   - Details
   - Progress
Formal model

- Set of worlds in principle possible (*not* represented in head)

The distinctions are just common-or-garden finegrainedness, nothing interesting going on there. The key point is that the worlds not being entertained are invisible, even inconceivable, to the agent whose mental state we’re representing. There’s a distinction between worlds behind the gray curtain and those that have been crossed out (ruled out by evidence): both are not ‘live possibilities’ as far as the agent is concerned, but the ruled out ones can still be discussed (she can give reasons for ruling them out); the ones outside the sphere of attention are completely inaccessible except through an attention update.
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- Within that, set of worlds held possible (represented in head)
- Operation *adding* worlds by attention to a possibility

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Updates (two-stage)

To update with $\varphi$:

Later attention updates may invalidate previously accepted statements. Just mentioning (under negation, in questions, hedged however-you-like) introduces possibilities. It doesn’t even have to be linguistic, if something happens to catch your eye you attend to it.
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Later attention updates may invalidate previously accepted statements. Just mentioning (under negation, in questions, hedged however-you-like) introduces possibilities. It doesn’t even have to be linguistic, if something happens to catch your eye you attend to it.
Whose information state?

- I believe $P$; I believe that you don’t believe $P$.

Because you can’t see outside your own attention state, not all nested combinations of epistemic/attentive operators are possible. If I assume $\varphi$ and I’m thinking about your mental state at all, then I assume you also assume (or believe) $\varphi$.

Typically in conversation we have a lot of mutual assumptions. If I notice you assuming something, but I think your assumption is harmless, I can leave you to assume it; but I (consciously) believe it.

“Sister”: I assume I have a sister, therefore I assume you believe I have a sister, and I don’t have to tell you this even if we’ve just met and you couldn’t possibly know. (Some kinds of presupposition accommodation seem to work like this: the speaker doesn’t even intend that the hearer accommodate anything.)
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- “I have to pick up my sister”: I assume you agree with my assumptions

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Splitting worlds (distinctions)

A: I was going to bake a cake, but I haven’t got any eggs.
B: Did you think of making shortbread?
A: I didn’t. Do you need eggs for that?

(AC paper)

A lot of argument about something relatively unimportant: we need finegrainedness somewhere in there. (We don’t have assumptions about every proposition we don’t attend to.)
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A: I didn’t. Do you need eggs for that?

(AC paper)

- Shortbread recipe needs eggs
- We have no eggs
- I like cake
- It’s Friday
- ...

- Shortbread recipe doesn’t need eggs
- We have no eggs
- I like cake
- It’s Friday
- ...

A lot of argument about something relatively unimportant: we need finegrainedness somewhere in there. (We don’t have assumptions about every proposition we don’t attend to.)
Intensional (linguistic) attention

- language of self-ascription of beliefs

More on finegrainedness (nice Stalnaker quote, but the point doesn’t need belabouring).
Most important, though, is the idea that attention defines the language the agent would use to report her beliefs, if asked to list ‘all of them’. She doesn’t notice that she believes she has a sister, so she doesn’t list it as a belief: the term ‘sister’ isn’t in that language of self-ascription of beliefs.
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Stalnaker

[There are surely an infinite number of possible worlds compatible with anyone’s belief state. But a believer’s representation of a space of possible worlds need not distinguish between them all. Just as a finite perceiver may see a space which consists of an infinite number of points, so a finite believer may represent a space of possible worlds which in fact consists of an infinite number of possible worlds.]

(Inquiry pg. 69)

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Summary

Models:

- Set of possible worlds (“metaphysical possibilities”)
- Set of worlds ENTERTAINED (not excluded by assumptions)
- List of propositions attended to (individuates states)
- Set of states HELD POSSIBLE (not excluded by information)

Updates:

- Attentiveness update:
  - overturn assumption (if any)
  - individuate states more finely
- Informative update:
  - first perform attentiveness update
  - next update within entertained worlds

Two kinds of updates. The attentiveness update is unavoidable; the informative update can be avoided by rejecting an assertion.
What I’m not telling you

- How do we expand the attentiveness sphere?

One formal story can be found in the paper with Michael, which is on both our websites; I’m working on another one with Maria Aloni and Paul Egré.
Progress

1. Intuitions

2. Details

3. Applications
   - Sobel sequences
   - Vagueness and standards of precision
   - Pragmatics of possibility statements

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“Now that you mention it…”

Applications

Progress
Sobel sequences

- Pairs of counterfactual conditionals (Sobel, Lewis)

I’m terribly against the von Fintel analysis, which doesn’t even capture all the data it’s supposed to (see Moss’s survey for some examples). There’s a lot of data though, so I tried to cast doubts rather than show impossibility. References: [Lew73; F01; Wil08; FG07; Mos07].
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- Today: Not a complete treatment, but some pointed questions

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Some Sobel data

\[ p > r \text{ vs. } p \land q > \neg r \]

A: If Sophie had gone to the New York Mets parade she would have seen Pedro Martínez.

B: If she had gone and got stuck behind someone tall, she wouldn’t have seen him.

(Sobel, Lewis)

B: If Sophie had gone to the New York Mets parade and got stuck behind someone tall, she wouldn’t have seen Pedro.

A: # If she had gone to the parade she would have seen him.

(von Fintel)

Slide-by-slide:

1. Classic Sobel example (motivates non-monotonicity of counterfactual semantics), and von Fintel’s observation that reversed it doesn’t work.

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3. . . . But small pragmatic adjustments make it better (supporting the stronger reading, without having to be explicit).

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6. Such adjustments also have an impact on acceptability of “might”.

I N S T I T U T E F O R L O G I C ,
L A N G U A G E A N D C O M P U T A T I O N

Tiktu de Jager (ILLC) “Now that you mention it…” LeGO 10/08 23 / 36
Some Sobel data

\[ p > r \text{ vs. } p \land q > \neg r \]

A: If Oswald didn’t shoot Kennedy then someone else did.

B: If the CIA faked Kennedy’s death [and Oswald didn’t shoot him] then nobody shot him.

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A: I’ve been through all the CIA records. If Oswald didn’t shoot him then someone else did.

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Tikitu de Jager (ILC) | “Now that you mention it…” | LeGO 10/08 23 / 36

2008-10-29
Some Sobel data

\[ p > r \text{ vs. } p \land q > \neg r \]

A: If William has proposed to Mary, she'll be our queen.
B: She might reject him.

(after Moss)

A: Mary might reject William [if he has proposed].
B: # If he has proposed, she will be our queen.

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‘‘Now that you mention it…”
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  - Sobel sequences
  - Some Sobel data
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A: (Believe me, I know Mary's mind.) If he has proposed, she will be our queen.

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Tikitu de Jager (ILLC) | “Now that you mention it…” | LeGO 10/08 23 / 36

“Now that you mention it…”

Applications
- Sobel sequences
- Some Sobel data
What a mess…

Questions:
- What does “# ϕ” mean?

Answers?

Complications:

These are general questions one should be asking about formal theories of pragmatics supported by data about intuitions. It’s not enough just to ask questions, of course, but the answers I have are partial and speculative.

Epistemic efficacy of stupidity: so long as we don’t consider too many strange contexts, our theories can stay simple. Is that the kind of ‘knowledge’ we want?

Problem of motivation: there are at least two ways to be ‘pragmatically infelicitous’. Making a statement cooperative might require a weird context; we shouldn’t take ‘weirdness’ judgements too seriously.

Dynamic interactive epistemology: we’re good at presupposing that others are assuming. Our example dialogues need to control for this; one way is to make all characters mention or accept a mention of all relevant possibilities at the beginning.
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Questions:
- What does \( \# \varphi \) mean?
- What is an acceptable dialogue?
- Who is doing the accepting?

Answers?

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Epistemic efficacy of stupidity: so long as we don’t consider too many strange contexts, our theories can stay simple. Is that the kind of ‘knowledge’ we want?

Problem of motivation: there are at least two ways to be ‘pragmatically infelicitous’. Making a statement cooperative might require a weird context; we shouldn’t take ‘weirdness’ judgements too seriously.

Dynamic interactive epistemology: we’re good at presupposing that others are assuming. Our example dialogues need to control for this; one way is to make all characters mention or accept a mention of all relevant possibilities at the beginning.
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- What does “# ϕ” mean?

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Complications:
- Epistemic efficacy of stupidity
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- Accommodation of inattention (dynamic interactive epistemology)

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And my story is...

...I'm not going to tell you!

I hope it's fairly clear how one might start to account for this sort of data using attentiveness. The details are messy, but it seems to work pretty well.
And my story is...

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  (doing it early adds constraints)
- Mentioning possibilities (however embedded)
- Interactive epistemology matters
  (“was she attending to $P$ when she said that?”)

I hope it’s fairly clear how one might start to account for this sort of
data using attentiveness. The details are messy, but it seems to work
pretty well.
What does it get us?

- Uniform account (counterfactuals, indicatives, whatever)

And here’s some fun. The formal theory predicts that it matters what attentiveness attitude the speaker has to an abnormality condition (like “she rejects him”) when making a conditional claim. But sometimes you, the hearer, just don’t know: you weren’t attending to the weird possibility so it didn’t occur to you to check if the speaker was. That causes difficulties (you have to revise models, rethink, maybe there’s no determinate interpretation) so we should expect to see considerate speakers trying to avoid the problem. And look: we see markers of discourse relations that seem to do exactly this! Formally speaking there’s a difference between processing a conjunction and its conjuncts in sequence: the attention updates happen at different times. That looks like a weird formal artefact... and then you find people doing it!
What does it get us?

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  - A: If William has proposed to Mary, she'll be our queen.

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  A: If William has proposed to Mary, she’ll be our queen.
  B: Uuh.

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  - A: ?? She could reject him.

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  A: If William has proposed to Mary, she’ll be our queen.
  B: Uhuh.
  A: ?? She could reject him.
  B: Isn’t that inconsistent?

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  A: If William has proposed to Mary, she'll be our queen.
  B: Uuhh.
  A: Even though in principle she could reject him.
  B: You mean she won't.

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- Simple semantics
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- Discourse relations
  A: If William has proposed to Mary, she’ll be our queen.
  B: Uuhh.
  A: Although I suppose she could reject him.
  B: Oh, I wonder whether she might?

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  A: If William has proposed to Mary, she’ll be our queen.
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  B: ... Did you mean she won’t reject him, or hadn’t you thought of it?

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Vagueness (not all of it!)

“Now that you mention it...”

- Applications
  - Vagueness and standards of precision
  - Vagueness (not all of it!)

Gratuitous film reference.
Vagueness (not all of it!)

The Blues Brothers

— It’s 106 miles to Chicago. We’ve got a full tank of gas, half a pack of cigarettes, it’s dark, and we’re wearing sunglasses.
— Hit it.

“Now that you mention it…”

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It’s actually 106 miles to Chicago. Alternative lines:

<table>
<thead>
<tr>
<th>Tikitu de Jager (ILLC)</th>
<th>“Now that you mention it…”</th>
<th>LeGO 10/08 28 / 36</th>
</tr>
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</table>

Standards of precision: it’s not just ‘the more precise the better’. Terms on different scales come with expectations of different levels of precision (Krifka has work along exactly these lines). Let the points on the scale be possibilities being attended to. We need to assume that measurements close to the middle between two points on the scale don’t occur. (This comes from the discussion – “assume” here in the technical sense of this model!!) Standards can be easily raised (considering more possibilities) but not lowered (getting rid of possibilities). This isn’t yet worked out fully, we may get difficulties with possibilities that should pop in and out depending on the scale at work.
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It’s actually 106 miles to Chicago. Alternative lines:
- It’s 100 miles to Chicago. (And 300 to Pittsburgh.)

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What does it get us?

● Simple (or at least general) semantics

This leaves one less problem for the vagueness folk to deal with. But, if Lewis is right, knowledge attributions (and presumably truth judgements as well) are vague in just this way! So that puts vagueness in at the bottom too.
What does it get us?

- Simple (or at least general) semantics
- Increasing standards of precision explained

This leaves one less problem for the vagueness folk to deal with. But, if Lewis is right, knowledge attributions (and presumably truth judgements as well) are vague in just this way! So that puts vagueness in at the bottom too.
What does it get us?

- Simple (or at least general) semantics
- Increasing standards of precision explained
- Properties of (properly) vague predicates linked to ... well, everything

This leaves one less problem for the vagueness folk to deal with. But, if Lewis is right, knowledge attributions (and presumably truth judgements as well) are vague in just this way! So that puts vagueness in at the bottom too.
Pragmatics of possibility statements

A: How should I go work this morning?
   The tram is uncomfortable, but a taxi is expensive.
B: There might be a tram strike today.

(AC talk)

We didn’t have time for this in the talk, which is a shame.
Do we want to put the pragmatics of “might” into semantics? Tricky to get right...
And then people seem to use questions, hedged statements, and similar to the same effect — surely their semantics doesn’t need adjusting in this way!
But ‘purely semantically’ “might” is so weak, why would anyone want to use it?
Pragmatics of possibility statements

A: How should I go work this morning?  
The tram is uncomfortable, but a taxi is expensive.

B: There might be a tram accident today.

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● There *always* “might be a tram strike”

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- Possibility statements express possibility

Mentioning possibilities produces an attention update, even if the informative update is vacuous. We work this out in (painful) detail in the paper, in a decision-theoretic setting.
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- When is that relevant/cooperative? When backed by beliefs. (Decision theory: AC paper, submitted paper)
- Why not say something stronger? *Weak beliefs/hearer* expertise.

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We work this out in (painful) detail in the paper, in a decision-theoretic setting.
What does it get us?

- Uniform account (questions, “might”, pointing, . . . )

This schema applies to pretty much all the applications: build attentiveness in at the bottom, and the top gets a lot simpler and more stable.
What does it get us?

- Uniform account (questions, “might”, pointing, ...)
- Simple semantics (flexible too!)

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What does it get us?

- Uniform account (questions, “might”, pointing, . . .)
- Simple semantics (flexible too!)
- Complications (and numbers) derived by pragmatics

This schema applies to pretty much all the applications: build attentiveness in at the bottom, and the top gets a lot simpler and more stable.
Progress

1. Intuitions

2. Details

3. Applications
   - Sobel sequences
   - Vagueness and standards of precision
   - Pragmatics of possibility statements

2008-10-29

“Now that you mention it...”
What I already said

- Attentiveness is ubiquitous — take it seriously!

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What I already said

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- It solves problems

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Thanks for your attentiveness!
(questions . . . and then the pub)

2008-10-29

“Now that you mention it . . . ”

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