

## TALKING ABOUT MODALITY: AN INTERVIEW WITH ANGELIKA KRATZER

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In December 6<sup>th</sup>, 2012, professor Angelika Kratzer received us for a tea to chat about modality in her office at Harvard University. She was a fellow visitant at Radcliffe Institute for Advanced Studies at Harvard during 2012-2013 academic year, developing a research on mapping possibilities. On April 22<sup>nd</sup>, 2013, she gave a brilliant conference about her research, which can be accessed at <https://www.youtube.com/watch?v=DAzSSEPJI2A>. It was a great pleasure to talk about modality with professor Kratzer, to attend her conference, and to follow her trajectory on modality. The interview aims at presenting a landscape of contemporary research on the field. As she says, in the end of this interview, there is so much to study!

### *Dever* and Weak Modality

**Recent researches on English modals like *ought to*, and on modals in other languages like Salish<sup>4</sup>, which seem to oscillate between necessity and possibility, opened new perspectives on modality. Some propose that those modals are weak necessity modals; others treat them as non-dual degree modals, which vary their meaning between possibility and necessity depending on the context. It seems to us that the auxiliary *dever* in Brazilian Portuguese has this chameleonic behavior. It is not rare to find functionalist descriptions of *dever* that treat it as expressing possibility. At the same time, the modal**

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<sup>4</sup> Salish covers all related languages in the Pacific Northwest regions and their study, originally by Matthewson, has brought up the problem of modals that do not have duals and the force of which seems to flip flop from existential to universal, depending on the context (Davis *et al* 2009).

**system in Brazilian Portuguese is triadic: *dever*, *ter que*, and *poder*. What is the theoretical scenario to understand modals that seem to oscillate between necessity and possibility?**

There are right now three proposals on the table. One is the weak necessity. That proposal is von Stechow and Iatridou's (2008) basically, and they always had the difficulty of saying something about how to distinguish the two ordering sources; how they would be individuated. That was their main problem, which has been solved in an interesting way by Rubinstein (2012). I think that is a very viable proposal. There is actually a variant of Rubinstein's proposal that she mentioned in a recent talk at MIT<sup>5</sup>, that there are certain assumptions, including normative assumptions, that are just present in every discourse, and so they are not particularly related to any modal words or anything. Like 'Don't commit murder' and things like that. That is one possible way of making Rubinstein's distinction: you distinguish between particular not necessarily collectively accepted norms, and that's what *ought* is sensitive to, as opposed to just general assumptions about ethical norms that are accepted by the community as whole, and this would be pragmatic presuppositions in Stalnaker's sense (1974). When you pick up on those distinctions, that is an interesting way of thinking about them. But I think there is still the question on why these modals don't have duals. If they were just necessity modals we would expect that there should also be possibility modals.

Amy Rose Deal (2011) has a proposal for these Nez Perce<sup>6</sup> dualist modals in terms of existentials. She has some arguments, but if you run through the arguments you see that that would also be fine, or compatible, with the proposal I made that these dualist modals are degree modals, they are sort of operant degree modals. If you look at downwards entailment contexts, for example, if you say something like

- (1) Nobody cleaned the downstairs offices,

then you understand this as implying that no downstairs office was cleaned, as opposed to if you say

- (2) John cleaned the downstairs offices,

you understand this as saying that all the offices were cleaned. So you get these homogeneity effects. Most of the arguments that Deal has in favor of the existential analysis behave in downwards entailing contexts. I think these arguments can all be replicated via homogeneity in an analysis that basically treats those weak necessity modals parallel to definite descriptions like 'in the best worlds'. So it's an interesting debate, I think.

**We need to decide whether *dever* has a dual or not; to show that its force may oscillate. How can we verify that?**

There, interaction with negation would play a role. We just have to look very very carefully what the properties are. The test would be sort of similar with the weak necessity modals. You have

- (3) Nobody ought to trespass,

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<sup>5</sup> "Weak necessity modals and modal discourse". Guest lecture in 24.979 Topics in Semantics, fall MIT graduate program, October 12<sup>th</sup> 2012.

<sup>6</sup> Nez Perce is a Sahaptian language, spoken by the Nez Perce tribe of northwestern United States.

or

- (4) Nobody ought to enter the room

and you paraphrase this as

- (5) Nobody may enter the room.

And if you have

- (6) Everybody ought to pay taxes

you can paraphrase it as

- (7) Everybody has to pay taxes.

I was wondering how *dever* patterns. That's different with *have to* and *must*. If you have

- (8) Everybody must pay taxes

and

- (9) Nobody must pay taxes.

It's very uniform, *ought to* and *should* behave differently. And so that would be one thing. You could just test it on the spot. So, when you have *nobody ought to trespass*, you can paraphrase this with *may*.

**Let's test it. Can *ninguém pode entrar na sala* ('nobody may enter the room') be a paraphrase for *ninguém deve entrar na sala* ('nobody ought to enter the room')? OK, it sounds good to me. Next, we check if *todo mundo tem que pagar impostos* ('Everybody has to pay taxes') can be a paraphrase for *todo mundo deve pagar impostos* ('Everybody ought to pay taxes' pagar'). It sounds good to me too. So, this test indicates that *dever* behaves as a degree modal in the sense it does not have one dual, at least in those deontic contexts, and its force oscillate between universal and existential. Most works on weak necessity focus on deontic and goal oriented examples, not on epistemic cases. It seems that talking about secondary parameters and entertaining options is easier in deontic and goal oriented modals, but not in epistemic ones. Epistemic modality seems to have been neglected so far. Do you agree with that? Are epistemic modals more difficult to account for?**

I find that a very interesting question. There isn't a lot of work on epistemics. There is a work by Stephen Finlay (2010). He is a philosopher, and he has a unified analysis of the deontic and the epistemic interpretation of *ought to*, and then Rubinstein (2012) has wonderful counterexamples against his analysis in her dissertation. They are really interesting. I think she now also wrote an article<sup>7</sup> based on that. Then, the question is still open. Because Finlay argues for probability analysis for both of those, and Rubinstein has fantastic counterexamples against that. But Rubinstein is not dealing with epistemics. So that is still open.

### Ordering Semantics, Probabilities and Comparatives

#### **What is the relation between ordering semantics and probability theories?**

I think that ordering semantics is compatible with the probability semantics. You probably need an ordering semantics independently. Here I recommend the literature on comparatives that relates what people do in degree semantics say, for adjectives, to measurement theory. There are two articles I can think of: one is by Alan Bale (2008), in *Linguistics and Philosophy*, and the other one is by Robert van Rooij (2010), in *Journal of Semantics*. They both, in slightly different ways, make clear what you do in measurement theory: you start with all the ordering, say, among individuals, and then you check under what conditions you can impose a measure that is faithful to the ordering. This is a whole discipline that I am not a specialist at all, but I found these two papers very useful. They don't have anything to do with modals, it's all about adjectives, but it is the same question, basically, that arises: how do we get the degree semantics from the ordering semantics? There are various ways of ordering individuals and some of those ways allow you to impose certain measures that again have certain properties. And it is all, in a way, a mathematical theory.

#### **How much of that do we need in natural language semantics?**

I think the question is very interesting because in some sense what the semantics gives us is the basis for then developing the mathematical theories that experts do. But usually what the experts do does not contradict common sense in any way, they are faithful to the language and then certain areas are just left open by the language faculty, which are just undetermined. And then that's an empirical question: are degree modals like comparatives in natural languages? Because there are interesting differences between, say, the comparatives that you can do with the adjectives like 'likely' and the comparatives that you can do in German with the modal 'kann'. There are a lot of fascinating open questions there.

#### **How do you relate degree modals and comparatives? What about adjectives and modals in German?**

Modals seem to behave like adjectives in every possible respect. But I don't think that these modal comparatives with auxiliaries that we have in German quite behave like adjectives. There are subtle differences, so that's where those considerations would come into play. But now I'd have to give you an explanation for why the two types of construction behave differently. In German you have those morphemes that are in 1981 article. *eher* is the morpheme in German, the comparative morpheme that you use exclusively for modal comparison, you use it with auxiliaries, or even with some modal adjectives, you use it for temporal comparison as well, in contrast to *mehr*, which is the comparative morpheme

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<sup>7</sup> "Figuring out what we *ought* to do: the challenge of delineating priorities" to appear in the proceedings of 36th Penn Linguistics Colloquium.

corresponding to English *more*. But you can also say something like *This is more for a chair than that* where you also use the *eher*. So you have two different morphemes and you use them differently. That opens up a whole interesting area of research I'm interested in, because it is usually neglected in English. You do have comparatives in English. You can say something like *It's more easily possible*. You form an adverb from the adjective *easy*, so *It's more easily possible to fly to the moon than to fly to Jupiter* is perfectly acceptable in English. For some reason, these comparatives haven't really been paid attention to a lot.

**BrP has a modal morpheme; sometimes you interpret it as possibility and sometimes as necessity. And it seems to depend on the root to which the morpheme is attached.**

Like *payable* in *the bill is not payable*, nobody can pay it, because it is too expensive; and then *the bill is payable by December 1<sup>st</sup>*. You have again the flip between necessity and possibility. But you also have these modal infinitives that Bhatt (1999) investigated, and also Hackl and Nissenbaum (2012) in a recent paper in *Natural Language Semantics*. I would look at those too. These flexible types of modalities that you find in adjectives, you will also find in modal infinitives.

**What are modal infinitives?**

For example, *the man to fix the sink*. That could be 'the man who can fix the sink' or 'the man who has to fix the sink'. These are from Bhatt. If you look at the whole range of constructions this is an interesting one too because there seems to be this flip and again there are several approaches that people have taken but I would through this in the pot.

**In that case, do you think the force of the modal is contextually dependent?**

Well, that would be my first hypothesis. We are dealing with a case of a modal that doesn't have a dual; rather, it's more like the Salish type. But you have to look at the arguments, because there are lots and lots of cases that they discuss and so I don't think they consider the hypothesis that this may be a modal without dual. Because when Bhatt wrote his dissertation as a book, this work on Salish was not known yet, that's precedent. And Hackl and Nissenbaum's recent paper is a revision of a paper that they had written much earlier, again before these Salish facts became known, and so they were not really counting on that possibility, as far as I can remember.

**Do you expect that these constructions - modal suffix, infinitive modals - have the same logical form as the auxiliary modals, i.e. they would also have a modal base and an ordering source?**

Well, I don't know I'm pretty much groping in the dark about those, but I would at least through this hypothesis. This may be like a dual as Salish modal or Nez Perce modal, or Gitksan modal<sup>8</sup>; at least look at that hypothesis and see what it implies. And since there is literature that explores a lot of cases, you are handed out a lot of test cases for free. This is so nice about the field: there is just so much converging evidence, so much data available in various languages!

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<sup>8</sup> Gitksan is one of the Tsimshianic language group, from the Pacific Northwest Coast area.

**And it's a pretty recent field, right? If we think about it, it started in '81, and it has grown a lot.**

Well people have started empirically to look at those cases. Right now it's very popular, it seems. It is very popular. Also in Philosophy it is very popular. It's good to see; all of a sudden this field became very popular.

The history of the field

**How do you see the history of the field?**

I was thinking about how my own thinking developed, just trying to reconstruct it. I was a student in New Zealand, and I was working with Max Cresswell in 1974, and then I went there for second time in 1976 for 3 months, and during those whole 3 months David Lewis was also there. And so that was the most important influence. I think the idea to work with the premise semantics started with thinking about the semantics of counterfactuals in a context where there was this very influential theory in David Lewis' book on counterfactuals (1973) and also one theory that he actually argues against, Nelson Goodman's approach which is a metalinguistic version of a premise semantics approach. And I was asking myself whether it would be possible to design a semantics for counterfactuals that is as good as Davis Lewis' but uses premises rather than similarity between worlds. Basically, I was struggling with Goodman, and trying to find out whether David Lewis type semantics could be developed from Goodman semantics. So John Pollok actually did something similar which I didn't know at the time. That's how the question came up. And the switch to ordering semantics was also tricked by David Lewis who wrote this very important paper about premise semantics and ordering semantics in 1981 and that paper established the connection between premise semantics and ordering semantics. So that was my starting point for working with ordering semantics most of the time, except from the work on counterfactuals where I continued to use the premise semantics because I still believe that such a generalization can be stated by the premise semantics.

**Even now with the idea that conditionals are modals.**

Yes, because at the end of the 1981 paper there is a parameter setting for counterfactuals: when you have counterfactual, you basically have an empty modal base and a totally realistic ordering source. That gives you the premise semantics for counterfactuals, but within the ordering framework. And in the latest instantiation of the "Lumps of Thought", Kratzer (1989, reprint 2012). I actually try to find some arguments that somehow show that the truth conditions of counterfactuals seem to often depend on the "word-ring" of the counterfactual. And, again, I think that is more naturally expressed in the premise semantics.

**What Paul Portner was discussing at his talk at Harvard<sup>9</sup> was a problem of how the premises enter into our reasoning, right? Would it also be a combination of ordering semantics with some sort of premise semantics?**

Yes. From the very beginning, even the 1977 paper, I sort of saw that a premise semantics has a lot of empirical potential. The main property I was interested, since that time of the premise semantics, was that there are premise sets, that they are deductively equivalent, but if

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<sup>9</sup> "Ordering Semantics and Comparisons of Probability". Circles Colloquium at Harvard University. November 30<sup>th</sup> 2012.

you use them to order a set, you have far reaching empirical differences. That's in fact in part what this 1981 paper by D. Lewis is about, to show that by really structuring these premise sets in a particular way you can enforce properties on the ordering. And so that was something that was interesting and that was basically overlooked by the literature. There is this more recent paper by Katz, Portner, and Rubinstein (to appear), that took up this idea, but interestingly it is not tying the roots of this very very beginning of ordering semantics. So, in some sense, the structure of premise sets was in there from the very very beginning. In "Partition and revision" (1981) I explore it maybe most directly.

**This is very hard stuff!**

Yeah this is very hard, but people must really take it up, it has a lot of empirical potential. So, it is hard stuff, but it is interesting. And I'm glad that Katz, Portner and Rubinstein are trying to find some principles for structuring these premise sets.

**In a sense, Rubinstein has to, since she wants to explain weak necessity by the sets of premises.**

Yes, if you use these ordering sources, if you use these premise sets to order them, of course. It's a fact that deductive equivalent premise sets can induce very different orders and so then we have to think about this, we have empirical principles to structure these premise sets, and that's what Katz, Rubinstein and Porter (2012) do. So they have these two principles, and I think that's nice. It's very new; it's the SALT paper from this year, from early this year.

Epistemic and Circumstantial Modal Bases

**The distinction between epistemic and circumstantial conversational background is tricky. Could you clarify it?**

You can tell the difference between epistemic and circumstantial if you look at the Condoravdi (2002) style cases. Say something like *he might have won* we don't know as opposed to *he could have won* we know he lost, but still at this point in the game he could have won. I think that's pretty clear. These are the cases if you want to look at the difference. You just set up the situation where you know that John ran the Marathon today and you don't know who won it, but you see him after the end of the race: you see him all cheery, celebrating on his porch, and so you say 'Ok, he might have won the Marathon'. That would be a situation. And the other situation would be where you already know that John lost (he ran the Marathon, but he didn't do very well, certainly didn't finish in the first place) and then you watch a video of the whole race, maybe you're an expert on marathons, and you see that at some point he still looks very strong, the timing is good, so at that point he could have still won.

**In BP we have two different structures. We would use different modals or different aspectual marks. For the circumstantial reading we would say *podia* - at that point he *podia ter ganho*. And for the other one, we would use the present tense, *pode ter ganho*.**

In German too. Also French expresses this very transparently. English is confusing in this respect. But these are the cases to look at.

**In your recent version of “The Notional Category of modality”, you distinguish between when you have information according to the newspaper and when you have *in view of the newspaper*. What is this difference?**

Well, it has more to do with domain projection, because the difference I’m looking for is between ‘given’ versus ‘according to’.

**Is that clear in English?**

I think it’s not a 100% clear. People pointed that out to me. But we can at least clarify the readings. You could say ‘according to his autobiography, Kafka was severely depressed’ and what you’re saying is that you’re looking at the content of the autobiography and the autobiography says: ‘I (Franz Kafka) am very depressed’ or something like that. And that contrasts with ‘given his autobiography, Kafka must have still been alive in such year because otherwise he couldn’t have written the autobiography’. So it is just two ways of projecting the modal domain: in one case you are looking at the set of possible worlds that are compatible with the content, and, in the other case, you are looking at the set of possible worlds that have counterparts of the autobiography. These are two very different ways of constructing the modal domain. In one case, you just do basically what Arregui (2007, 2008, 2010) was doing with de counterfactuals. And in the other case you look at the content.

**When you look at the content, is it the modal base or an ordering?**

Well usually I mean the strategy is that, whenever there are possible inconsistencies, you take it as an ordering source, because the modal bases are always factual.

**And if they are always factual I find puzzling that towards the end of the paper you claim that epistemic does not mean knowledge...**

Yes, that is right. It is just a terminology for a particular type of modals. It’s not necessarily related to anybody’s knowledge. So, I have this example of the filing cabinet, which falls from heaven, and nobody knows what really the information in it is. But we do know that it has the complete truth about the murderer of Much-Girgl, or someone. Then we can play a game about who must have been the murderer according to the information in the filing cabinet, but it’s not according to anybody’s knowledge. We just say, ok, let’s guess what is in that filing cabinet and whether it’s possible or necessary given that information, according to that information, that Kastenjakl was the murderer. But we don’t know what the information is. If you take knowledge literally, as it is understood in Philosophy, then not all modals that we classify traditionally as epistemic relate to knowledge. If you have this betting scenario, ‘let’s bet who must have been the murderer according to those files’. None of us knows, we’re just making a guess, taking a bet. Let’s say, a blood sample. The blood sample establishes who must have been the father of the kid. And then, we guess. None of us knows, the blood sample is here and still needs to be investigated. We just take bets. And we say ‘according to this sample, John must have been the father’, that’s my bet. And you say ‘according to this sample, Fred must have been the father.’ But that’s your bet. It’s a bet with respect to the information that’s uniquely determined by this blood sample. And we just happen to not know what that information is, but we take a bet. And I think that is a prototypical case of epistemic modality. Of course usually you know what the information is, but it’s not a necessary condition that you know what the information is. This little far-fetched example of the blood sample makes the point best, probably.



**How do you see the landscape of modality in contemporary linguistics?**

Ok, I've been trying to think up what the main topics are. And so let's just go through that. One big topic is the projection of modal domains, how they get projected.

**What do you mean by “projected”?**

One way of thinking about this is that we walk around in the world by projecting possibilities. You see a track in the snow that is the possibility of a bear having walked by. You see tracks of a coyote or, whatever. So there is a thing in the actual world, and that thing determines possibilities. If you read a college catalog with all the courses in there, there are possibilities of what you can study opened up by those. A baby born has possibilities for the future, you have possibilities for the future. There are things in the world that determine possibilities in a very systematic way. A book determines the possibilities that are compatible with the content of the book. That is a different way of projecting possibilities and that is, I think, a very very important area. Ana Arregui (2009) has that very important work for counterfactuals. What she is saying is that the possibilities for counterfactuals are projected from the past. So you consider 'if I wasn't sitting in this office right now, then I would be in Somerville', or something like that. Here, the modal domain that you have, according to Arregui, would be projected from the actual past, and the actual past is a part of the actual world, the past part of the actual world, and the possibilities that you are considering is the set of all possible worlds that have very close matches or counterparts of that past. And so that would be a very concrete domain projection.

**For historical thinking as well.**

In this case, yes. And I think that is similar, in fact, with the tracks in the snow. So, what you have are the tracks on the snow, the possibilities, or you look at the set of all possible worlds that have very close matches of those tracks in the snow, and then you make these general assumptions that you live in a world that the laws of nature hold, etc. And so that is one way of domain projection, and you can also see, once you sort of look at in those terms, what grammar does with us, namely, it represents the anchors from which those possibilities are projected, and again you're going to find it in Arregui, you have tense which denotes the past part of the world of evaluation; tense that provides the anchor for the projection of possibilities. I think that is a very very important idea that is also in part behind what Valentine Hacquard (2006) does. So you have anchors from which you project possibilities and the grammar represents those anchors. That's in some sense how modal bases are represented in the grammar.

**Condoravdi (2002) distinguishes the perspective from where you are going to entertain the possibilities, and the time of the prejacent, the tense of the embedded proposition itself.**

Actually there is this recent work by Lisa Matthewson (in press) on Gitksan, which talks about those cases; the Condoravdi's cases and the two roles most likely are played by tense versus aspect in a way. In Arregui's approach the tense gives you the modal anchor and then you have an aspectual orientation in the prejacent of the modal, and that gives you the future

orientation. So, if you have something like ‘he could have won the game’, one of those Condoravdi’s cases, you’re looking at a past part of the actual world and then you have perspective aspect, you’re looking to possible continuations of the world into the future and that’s what perspective aspect does. Arregui really has explored this interplay between tense and aspect very intensively. And the theory of modal domain projection – this is how I would call it – leads to a very natural way of thinking about how modal domains are represented in grammar, namely, via the anchors. Once you have the anchor you can project the modal domains via a fix recipe. That’s what is in the center of my own work right now, but it does have its roots there in both Arregui’s work and Hacquard’s work. So, that is one thing.

Then there are - we have talked about this already - the differences between modal auxiliaries and modal adjectives with respect to gradability, for example, and there is interesting work. Let me get you a few names: Portner (2009) brought that up in his book and he asked the question that Yalcin (2010) also discussed a little bit; there is Lassiter (2011) in a dissertation and, most recently, Peter Klecha, who is writing his dissertation in the University of Chicago. There is also a *Sinn und Bedeutung* paper by him, a very nice work – Klecha (2012). Klecha also contents with Lassiter’s, which is an interesting dispute. The people in Chicago, of course, are naturally interested in degrees, and know everything about adjectives. So Kletcher is now thinking about gradability with modals, but what these people mainly do is looking at modal adjectives, because in English they don’t have the full range of comparative constructions with modal auxiliaries, which I think could be the interesting point. So, that is an interesting and hot area.

We have already talked about weak necessity modals and the modals without duals. There’s von Fintel and Iatridou (2008), Rubinstein (2012), Matthewson, Davis, Tyla Peterson (2008) on Gitksan, and Deal (2011) on Nez Perce. So you have all this literature.

Then another interesting area is free choice items, the interaction of these free choice items and probability. The full range of possibilities is explored by Luiz Alonso- Ovalle and Paula Menendez Benito (2010a, 2010b, 2011, and Menendez Benito 2010). They have these four or five articles where they go through these various free choice items, but there is, of course, earlier work on “whatever” by Dayal (1997) and von Fintel (2000). There is a work by Giannakidou (2001).

There is interesting work on micro-variation that comes right now from the University of Ottawa, also Ana Arregui. She has a joint grant was Maria Luisa Rivero and Andrea Solanova, and so they look at micro-variation in modals. Rivero does Slavic and Arregui, of course, has Spanish and Andrea has these various indigenous languages that they are looking at, so that is also very interesting.

Also I’d like to mention there is something on sublexical modality and so there has been work by Jean-Pierre Koenig (see Koenig & Davis (2001)). Yeah, a very recent work I heard and I was very enthusiastic about in Ottawa by Fabien Martin and Florian Schaeffer (2012), they are in Stuttgart. I can just tell you one fact that has been discussed by Martin and Schaeffer. It has to do with the verb ‘offer’. So I can say ‘I offered him a fabulous view of Chimborazo through my binoculars’ or something like that. It doesn’t really imply that he had seen that fabulous view; he could have declined my offer. But then if you say something like ‘The flight over the Andes offered him a fabulous view of Chimborazo’ that implies that he had the fabulous view. So there are actuality entailments. That’s where modality comes in. That’s interesting topic and they have a very nice paper that they gave it in various conferences. I heard them in Ottawa, but they also gave that paper at NELS. I find that interesting. Then I’ve mentioned already the modal infinitives so that would be bought in Hackl and Nissebaum, and I think a dissertation by Nick [Nicholas] Fleisher (2008). And then, of course there is all of this new literature on conditionals, that is interesting also. What von Fintel and Gilles are doing (see von Fintel & Gillies (2010) among others). So we are in

together, in a little bit of a race about the restrictor view of conditionals. They are trying to find some arguments that would invalidate this view. Most of the arguments have to do actually with probability conditionals, so that is interesting, I'm enjoying that. That's what I could think of.

### **What about evidentials?**

Oh, yeah, evidentials, very good. That is an important area that should be added here. I think I agree and think Martina Faller (2002) has come around to that position too that basically they are epistemic modals, then the type of modality could be overtly classified by evidential elements that you say. You basically put constraints on the ordering source or the modal base and this is what evidentials express, like evidential morphology. In the logical representation you could have a modal and then you could have another inflectional element that classifies the type of modality of a particular kind. One language may spell out the modal, it may look like a circumstantial modal in the language, and other language may just spell out the evidential and not spell out the modal at all.

### **But that means that you have the modal ...**

We always have the modal. And what the evidential does is to select the ordering source or the modal base.

### **So you can't combine the evidential with the modal base, can you?**

Oh, you can, like in logical form you can have two elements. You could have a modal and then you could have a modifier that restricts the modal to a particular type. And then you have to think how to spell out these two elements. So you could spell it out as in English, as 'must'. In English, epistemic 'must' behaves like an indirect evidential. It does spell out the modal and some constraint... but that 'must' sounds like just deontic 'must' and so, yeah, I think that is a matter of how you spell out these elements. In principle there are two elements there. And doesn't matter how we call them. You need to, in some languages, just only spell out the evidential information and some languages only spell out the modal information, the modal strength information.

### **And in principle you could have a language with both?**

In principle, yes, so that is the interesting prediction, exactly.

### **And with *must* you can never use with direct evidence.**

Yeah, that is true, so, again, von Stechow and Gillies have interesting examples.

### **With *deve* certainly you cannot have direct evidence**

Yeah, similar story...

It's exciting there is so much work!

**Thank you!**

**Acknowledgments:** We would like to thank professor Angelika Kratzer, the Radcliffe Institute for Advanced Studies at Harvard, CAPES, for supporting Pires de Oliveira's sejour at Harvard University, and CNPq, for supporting Pessotto dos Santos sandwich at MIT.

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