

Referential Dependence in Language and Mind

Lecture 3.

Treating Proper Names in MSDRT: Vicarious anchors and Links.
The communication-theoretic Perspective

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Note to the reader of these slides.

- These are the slides from Lecture 3 (Dec. 1).

But there is a good deal more here than I showed or discussed in the lecture.

First, there are the slides on the fallibility of anchors and on mental state constituents as temporal continuants, which I suppressed in the lecture and replaced by a brief impromptu description of what is in them.

Second, I am including here the slides for MSDRT's treatment of attitude attributions with empty names like *Vulcan*

So you are getting this second bunch of slides a little bit in advance this time. But I will go through them coming Thursday (Dec. 8) on the assumption that people haven't seen them yet.

Last Week and This Week

- The main points of Lecture 2:
- We saw how to construct Logical Forms from MSDRT for English attitude reports.

This included one report that attributes two propositional attitudes:

John believes that it is raining. He hopes that it will stop raining.

- This brought the second main ingredient of MSDRT into play: the predicate *Att*, whose predications are of the form:

‘ $s: Att(a, MSD, LinkSet)$ ’

- Today we will look at more attitude reports, all of them involving proper names. This will lead us to the remaining features of MSDRT: **vicarious anchors** of ERs, **many-membered Anchor Sets** and the **Link Sets** of *Att*-predications.

Utterances with Proper Names

- In the 1st lecture we looked at a sentence with proper names:
 - (1) Mary is in Paris.
- The little I said about this sentence in Lecture 1 is the core of how MSDRT treats proper names as *vehicles for communicating reference*:

The utterer S is thinking of some entity \mathbf{d} and uses a name N she has for \mathbf{d} . and her interpreter H has to establish reference to \mathbf{d} in his mind through his interpretation of N .

Both for S and for H , ‘thinking of \mathbf{d} ’ is explicated in MSDRT in terms of having an Entity Representation for \mathbf{d} .

- I repeat the relevant parts from the slides about ‘Mary is in Paris.’ I presented in Lecture 1:

Proper Use and Interpretation of Proper Names

- S's mental state before she utters 'Mary is in Paris',

$$(2) \left\{ \begin{array}{l} \left\langle [ENT, m], \begin{array}{|c|} \hline \\ \hline \text{person}(m) \\ \hline \text{Named}(m, \textit{Mary}) \\ \hline \end{array}, \mathcal{K}_m \right\rangle \\ \left\langle [ENT, p], \begin{array}{|c|} \hline \\ \hline \text{city}(p) \\ \hline \text{Named}(p, \textit{Paris}) \\ \hline \end{array}, \mathcal{K}_p \right\rangle \\ \left\langle BEL, \begin{array}{|c|} \hline \\ \hline \text{in}'(m, p) \\ \hline \end{array} \right\rangle \end{array} \right\}$$

Proper Use and Interpretation of Proper Names

- Presupposed state of mind of H just before interpreting S's utterance of 'Mary is in Paris'.

$$(3) \left\{ \begin{array}{l} \left\langle [ENT, m_H], \begin{array}{|c|} \hline \\ \hline \text{person}(m_H) \\ \text{Named}(m_H, \textit{Mary}) \\ \hline \end{array}, \mathcal{K}_{m_H} \right\rangle \\ \left\langle [ENT, p_H], \begin{array}{|c|} \hline \\ \hline \text{city}(p_H) \\ \text{Named}(p_H, \textit{Paris}) \\ \hline \end{array}, \mathcal{K}_{p_H} \right\rangle \end{array} \right\}$$

Proper Use and Interpretation of Proper Names

- H's mental state after interpreting S's utterance and believing what she says.

$$(4) \left\{ \begin{array}{l} \left\langle [ENT, m_H], \begin{array}{|c|} \hline \\ \hline \text{person}(m_H) \\ \hline \text{Named}(m_H, \textit{Mary}) \\ \hline \end{array}, \mathcal{K}_{m_H} \right\rangle \\ \left\langle [ENT, p_H], \begin{array}{|c|} \hline \\ \hline \text{city}(p_H) \\ \hline \text{Named}(p_H, \textit{Paris}) \\ \hline \end{array}, \mathcal{K}_{p_H} \right\rangle \\ \left\langle BEL, \begin{array}{|c|} \hline \\ \hline \text{in}'(m_H, p_H) \\ \hline \end{array} \right\rangle \end{array} \right\}$$

Proper Use and Interpretation of Proper Names

- This, however, is an incomplete account of MSDRT's treatment of proper names.

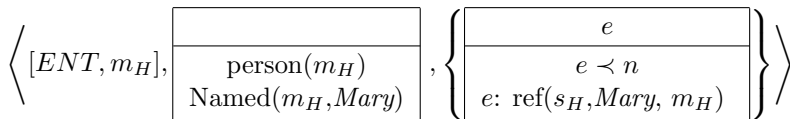
Missing is the interpreter's introduction of *vicarious anchors* to his ERs for S's references to *Mary* and *Paris*.

- To understand the role of vicarious anchors, first consider the case where H doesn't have an ER he can use for interpreting S's use of *Mary*.
- In this case, we noted, H has to accommodate an ER for Mary as part of his interpretation of S's use of *Mary*.

Proper Use and Interpretation of Proper Names

- This ER should represent the referent of S's use of *Mary*, whoever this referent may be from H's current perspective.
- That is: H's new ER must represent the referent of S's use of *Mary* **by stipulation**.
- This is accomplished by H's adoption of a *vicarious anchor*, as testimony of this commitment.
- This vicarious anchor is entered into the Anchor Set of H's new ER.
- That is, H's accommodated ER will be as in (5).

(5)



Proper Use and Interpretation of Proper Names

- The DRS in the third slot of the *Mary*-labeled ER is our first example of a vicarious anchor.
- The general form of vicarious anchors is given in (6).

$$(6) \quad \boxed{\begin{array}{c} e \\ \hline e \prec n \\ e: \text{ref}(\sigma, \gamma, \alpha) \end{array}}, \text{ where}$$

- ▶ σ is the distinguished dref of the interpreter's ER for the utterer.
- ▶ γ is the referring expression the utterer has used.
- ▶ α is the distinguished dref of the ER to which the anchor belongs, as a member of its Anchor Set.

(So some form of self-reference is involved here.)

Proper Use and Interpretation of Proper Names

(MSD of H after interpreting ‘Mary is in Paris’ and accommodating a *Mary*-labeled ER)

$$(7) \left\{ \begin{array}{l} \left\langle [ENT, s_H], \begin{array}{|c|} \hline \\ \hline \text{person}(s_H) \\ \hline \end{array}, \mathcal{K}_{s_H} \right\rangle \\ \left\langle [ENT, m_H], \begin{array}{|c|} \hline \\ \hline \text{person}(m_H) \\ \text{Named}(m_H, \textit{Mary}) \\ \hline \end{array}, \left\{ \begin{array}{|c|} \hline e \\ \hline e \prec n \\ e:\text{ref}(s_H, \textit{Mary}, m_H) \\ \hline \end{array} \right\} \right\rangle \\ \left\langle [ENT, p_H], \begin{array}{|c|} \hline \\ \hline \text{city}(p_H) \\ \text{Named}(p_H, \textit{Paris}) \\ \hline \end{array}, \mathcal{K}_{p_H} \right\rangle \\ \left\langle BEL, \begin{array}{|c|} \hline s' \\ \hline n \subseteq s' \quad s': \text{in}'(m_H, p_H) \\ \hline \end{array} \right\rangle \end{array} \right\}$$

Proper Use and Interpretation of Proper Names

- The vicarious anchor of such an accommodated ER *renders* it a representation of the entity to which the utterer has referred by using the name *N*.

The interpreter's ER and the ER on which the utterer based her use of *N* are *declared* coreferential.

- MSDRT's assumption that the ERs which interpreters accommodate in order to interpret unfamiliar names is its implementation of Kripke's insight that it is by such transfer of names to recipients unfamiliar to them that names spread through a speech community (Kripke (1980)).

Proper Use and Interpretation of Proper Names

- But MSDRT assumes that interpreters of proper names do not only add vicarious anchors to the ERs they are forced to accommodate in order to interpret a name N .
- They also add such anchors to the ER they use to interpret N when this is an ER they already had.
- This is one way in which the Anchor Set of an ER can grow after it has first been introduced, as a result of reusing it.

Multiple Anchoring and Recognition

- In fact, using an N -labeled ER you have when interpreting the use made of N by someone else can be seen as a form of *recognition*:

You recognize the referent of the ER as the entity that the user is referring to.

- This way of recognizing an entity, as the one referred to by some other speaker, is one of a number of different forms that recognition can take.
- For another form consider the following case.

I see someone walking down the street and recognize her as Mary.

- MSDRT analyzes this case as (i) entailing that I have an ER for Mary, and (ii) that I identify the person I see with the entity represented by this ER.
- This identification then results in my adding the perceptual anchor produced by my visual perception to the ER's Anchor Set.

Multiple Anchoring and Recognition

- MSDRT treats all forms of recognizing entities as involving an ER for that entity:

Recognition is identifying an entity with which one has been put into contact by a current event as the one that is represented by that ER.

- MSDRT further assumes that each such recognition event leads to the addition of an anchor to the Anchor Set of the ER involved.
- What type of anchor gets added depends on the form of the recognition.

Multiple Anchoring and Recognition

- An issue about Anchor Sets: MSDRT predicts that the Anchor Sets of Entity Representations for entities we often encounter get very big. Is this plausible?
- Answer:
 - ▶ We can see these large Anchor Sets as records of the history of their ERs, without implying that all the anchors they contain are present in any form in the agent's mind.
 - ▶ In fact, at any time t in the history of an ER $\langle [ENT, \alpha], K, \mathcal{K} \rangle$, the anchors in \mathcal{K} can be distinguished into (i) *active anchors*, (ii) *dormant anchors* and (iii) *lost anchors*
 - ▶ At t only the first two types are still present in the agent's mind in some form. And of these only the first category can play a part in the agent current deliberations.

Fallibility of Anchors and Anchor Sets

- Sometimes anchoring goes wrong. There are two ways in which this can happen.
- First, an anchor can be ‘fake news’:

For instance, the perceptual experience of agent *A* in Lecture 1 may have been an optical illusion:

There was nothing lying on the tarmac where she thought she saw a coin.

Or I think I hear someone speaking, but the voice is only a voice in my head.

In such cases the anchor is a false witness:

There isn't any entity to which the agent stands in the causal relation of which the anchor is meant to be the record.

Fallibility of Anchors and Anchor Sets

- Vicarious anchors can be false witnesses too.
- For instance, S can make an utterance that contains the name of the protagonist of some story.
- She knows that she isn't using the name to refer to a real person.
- But H doesn't know that and takes her to use the name as the name of someone real.
- So he will accommodate an ER with a vicarious anchor to link it to the referent of an ER for a real person that he assumes S to have used in her utterance of the name.
- But he is wrong. S has no such ER and there is no real entity his anchor can connect to.

Example: Mummy and Johnny talk about Santa. Johnny mistakes Mummy's uses of *Santa* for references to what he takes to be a real person. Each time she uses *Santa*, he adds a fake vicarious anchor to his ER for Santa.

Fallibility of Anchors and Anchor Sets

- When an Anchor Set contains more than one anchor, another problem can arise:
- Different anchors in the set connect the ER with different entities.
- Anchor Sets with this deficit are called *incoherent*.
- Incoherence can arise in various ways.
- Suppose I walk along the street and think I see Mary on the other side some distance in front of me, but then the person turns around the corner and is out of sight.
- In fact, she wasn't Mary.
- So the perceptual anchor that I add to the Anchor Set of my ER for Mary is wrong:

It connects my ER to some other person than the one it represented so far.

Fallibility of Anchors and Anchor Sets

- Another example:
- You use the name *Bill* in something you say, I take you to be referring to Bill Jones.

But as a matter of fact you were referring to Bill Smith, relying on your ER for Bill Smith when you used *Bill*.

- So the vicarious anchor I add to my ER for Bill Jones now corrupts it by linking my ER to your ER for Bill Smith.

Fallibility of Anchors and Anchor Sets

- The confusion that results from Anchor Set incoherence can be more or less serious.
- Quite often it is harmless.
- For instance, I can be wrong about the person walking along the opposite side of the street some 25 meters ahead of me.
She isn't Mary, contrary to what I think.

But Mary plays no serious part either in my emotional life or in my practical deliberations.

The question whether it was her walking along the street or wasn't is of no real interest or importance to me.

Fallibility of Anchors and Anchor Sets

- But the matter is different when Mary is someone I much care about.

Suppose she told me yesterday that she would be out of town today, and now I think she has lied to me, and I worry why, and am very upset.

- One factor that plays a part in how serious the consequences of Anchor Set incoherence can be are the numbers and distribution of the conflicting anchors.
- Bad cases can arise when the Anchor Set consists of two more or less equally sized subsets $Anch_1$ and $Anch_2$, with the anchors in $Anch_1$ connecting the ER to an entity \mathbf{d}_1 and those in $Anch_2$ to a different entity \mathbf{d}_2 .
- Such cases are especially bad when both $Anch_1$ and $Anch_2$ contain *epistemically rewarding* anchors:

anchors that are witnesses of encounters with the referent that provide the agent with substantive new information about it (Recanati (2016)).

Fallibility of Anchors and Anchor Sets

- Agents often find out about Anchor Set incoherence of an Entity Representation eventually.

Typically this happens when the agent discovers an inconsistency in the properties she has come to attribute to the supposed referent of her ER:

No single entity can have all the properties she has come to believe of this supposed referent.

- She concludes that she must have confounded bits of information from different entities.

And she must now try to sort that information into the parts that belong to those different entities.

- Sometimes this sorting – the ‘fission’ of the ER into two or more (Recanati (2016)) – can be very difficult.

Temporal Profiles of Mental State Constituents

- Mental states and their constituents are *temporal continuants*:

Entity Representations and Propositional Attitudes have temporal duration.

So the mental state of an agent over her course of her life can be thought of as a thread spun together from the Entity Representations and Propositional Attitudes that it is made up of at the different times of its duration.

- Moreover, the Entity Representations and Propositional Attitudes themselves can change in the course of their existence.

Temporal Profiles of Mental State Constituents

- Here are some of the ways in which Entity Representations and Propositional Attitudes can change over time.
- First, Entity Representations.
- One way in which ERs can change we have already seen:
Their Anchor Sets can grow, and also shrink through the expunging (irretrievable forgetting) of anchors they previously contained.
- Moreover, the descriptive part of an ER can also change during the ER's existence.
- One instance of this is when the agent learns a new name N for the entity represented by the ER referent.
- In this case a new Naming Condition 'Named(α, N)' is added to the descriptive component of the ER, which otherwise remains as it was.

Temporal Profiles of Mental State Constituents

- A second way in which the descriptive component of an ER might change is more controversial.
- Suppose you see something in the distance that you take to be a woman. But as you are getting closer, you realize at some point that what you are seeing isn't a woman but the stump of a tree trunk.
- Do you change the sortal information in the ER for what you are seeing at that point, from 'woman'(α)' to 'tree trunk'(α)'?
- Or do you replace your old ER wholesale by a new one, whose second component says that what it represents is a tree trunk, and not a woman?
- Such questions about the ontology of temporal continuants are often difficult to decide. As I am uncertain according to what criteria they should be decided, I leave this and similar questions open.

Temporal Profiles of Mental State Constituents

- A third reason for change in the descriptive components of ERs is equally controversial.

It is also more difficult to properly explain, but let me have a try.

- The idea is this. In general an agent will associate with each of her ERs a range of beliefs that are about the entity it represents.

Some of these beliefs she will consider as more ‘essential’ to the entity than others.

- But what are the ‘essential’ properties of an entity?

And is there any sense to one property being ‘more essential’ than another (if that is not just an unhappy way of saying that the first is essential and the second is not)?

- I have a hunch that there are and there is.

Temporal Profiles of Mental State Constituents

- When we reason about entities we only know indirectly, for instance a man from antiquity like Aristotle, we often ‘define’ him for ourselves in a certain way:

as Plato’s most distinguished pupil, or as the most famous tutor of Alexander.

- We then treat the properties used in the definition as beyond questioning and think about the other properties of the entity given in this way.
- MSDRT models this kind of ‘context-dependent essentialism’ by assuming that in the given deliberation context the agent enters the relevant definition into the second component of the ER.

At the same time all other information about the entity is represented in the form of Propositional Attitudes with content specifications that make use of the distinguished def of the ER.

Temporal Profiles of Mental State Constituents

- These changes are changes in the internal formatting of information present in the agent's cognitive system.
- They cause changes in the ER that only affect its internal interaction with other parts of the agent's mental state.
- The identity of the ER as entity representation, which is linked to the entity it represents via the events witnessed in its anchor set, is not compromised by them.

Temporal Profiles of Mental State Constituents

- Propositional Attitude constituents of mental states can also change in the course of their life time.
- For one thing they can change their propositional content.
- A natural example are attitudes of the type INT(ention), and especially those of the complex type of a Plan, which is made for the realization of some Goal.

Temporal Profiles of Mental State Constituents

- When we form an intention, or make a plan, to reach a certain goal, we often lack some of the information needed for its execution.
- But often it will be possible to find this information between the time when intention or plan is first conceived and the time when execution starts.
- And when this information becomes available, the content of intention or plan can be amplified.
- Such amplifications are changes in contents specifications.
- But it would seem wrong to think of them as having the effect of replacing one intention or plan by another.

Temporal Profiles of Mental State Constituents

- Arguably, Propositional Attitudes can also preserve their identity under certain changes of their Mode Indicators.
- There are two quite different reasons for this possibility.
- The first arises with more finely discriminating repertoires of Mode Indicators.
- For instance, instead of a repertoire with a single Mode Indicator BEL , we can think of MSDRT languages with a range of different Indicators BEL_r for different doxastic strength degrees r .
- In such languages it is possible to express how the strength of a given belief can change over time.
- The natural description of such variations in strength would be that of a single Propositional Attitude whose form changes in that it has Mode Indicators BEL_r for different r in the course of its life time.

Temporal Profiles of Mental State Constituents

- My second reason may be seen as more controversial.

It has to do with changes between Mode Indicators from the more limited repertoires which have been assumed in the examples we have looked at.

One possible example is the change of a hope into a belief after one has found out that what one hoped for has come true.

Another, somewhat similar case is the observation that one has successfully executed ones plan and its goal as been achieved.

And a third one are changes in the emotional connotations of our expectations.

Until now I have been hoping that my former girl friend will come and see me some time next week.

But now that you have told me she is coming to see me to confront me with a large bill she thinks I should be the one to pay, this same expectation had turned from hope to fear.

Temporal Profiles of Mental State Constituents

- For all these cases the question can be raised whether the change in Mode Indicator is:
 - just a change in the form of a continuing Attitude
 - or whether it constitutes the end of one Attitude and the beginning of a new one.
- As noted earlier, such questions are often difficult to decide, and I do not understand very well according to what criteria they should be decided.
- How to deal with these kinds of change is left to the individual user of MSDRT.

Temporal Profiles of Mental State Constituents

- MSDs are snapshots of mental states, records of mental states at single instants of time.
- They are sets of snapshots of Propositional Attitudes and Entity Representations.
- But mental states and their constituents are temporal continuants.

These temporal continuants can be reconstructed as *temporal profiles*: instant-indexed families of snapshots of mental states, Propositional Attitudes and Entity Representations. Formally:

- The *Mental profile* of a mental state, Propositional Attitude or Entity Representation – is a function from the set of instants at which they exist to their snapshots at those instants.
- On the next slides I give some formal definitions that connect the temporal continuants and their snapshots.

(We won't be making much use of these definitions during what remains of these lectures. But they provide a backdrop for what I still have to say.)

Temporal Profiles of Mental State Constituents

- 1. By $T_{ml(A)}$ we understand the total duration of the mental life of A .
(We can think of A 's mental life as the function $ML(A)$ defined on $T_{ml(A)}$ that assigns to each instant t in $T_{ml(A)}$ the MSD that gives a full description of A 's mental state at t .)
(N.B. This presupposes some particular Logical Form language of MSDRT that is considered sufficient for this purpose of exhaustive description.
It may be debatable what this language is like and whether it can be exhaustively defined.)
- 2. Suppose that the Entity Representation ER belongs to $ML(A)(t)$ for some time $t \in T_{ml(A)}$.
In all or nearly all cases ER will then also belong to $ML(A)(t')$ at neighboring times t' from $T_{ml(A)}$.

Temporal Profiles of Mental State Constituents

- But here is a general assumption we make:

The set T_{ER} consisting of those $t' \in T_{ml(A)}$ at which ER belongs to A 's mental state is a *period of $T_{ml(A)}$* .

- (A *period* of a stretch of time is a 'convex set' of instants belonging to that stretch; that is a set T with the property:

if t' and t'' belong to T and t''' is an instant from the stretch such that $t' \prec t''' \prec t''$, then t''' belongs to T .)

(That is: the set is a 'convex set' T_{ER} : if t' and t'' belong to T_{ER} and t''' is such that $t' \prec t''' \prec t''$, then $t''' \in T_{ER}$.)

- We make the same assumption about Propositional Attitudes that belong to mental state 'snapshots' $ML(A)(t)$ at some instant t of $T_{ml(A)}$.

The sets of times at which they belong to $ML(A)$ are also always periods of $T_{ml(A)}$.

So much for mental states and their constituents as temporal continuants.

Temporal Profiles of Mental State Constituents

- Many complex attitude reports compare the mental state of an agent at one time with her mental state at one or more other times.
- The Logical Forms for such reports must be able to cross-identify the constituents of the agent's mental states at different times.

Since mental state constituent can change over time, this is a non-trivial issue.

- The MSDs we have been using do not provide the means for cross-identification.
- Some notational device is needed for this beyond what has been shown in the lectures.
- I do not introduce such a device here. But see Chapter 4 of *Introduction to MSDRT* on the Collège de France website for the lectures.

MSDRT and the Social Dynamics of Language

- MSDRT has a good deal to say about the internal dynamics of the mental lives of individual agents.
- But MSDRT also makes claims about the dynamics of entire speech communities.
- Its reconstruction of what Kripke has had to say about the spreading of names is one example of this.
- But MSDRT's communication-theoretic analyses of utterance production and interpretation generalize this reconstruction considerably.
- The links between Entity Representations of communicating agents and between agents and texts are structured in perpetually changing ER networks.
- These networks create and sustain the cohesion within speech communities without which the use of language as communication vehicle would be impossible.

Attitude Reports with Proper Names

- After this interlude about anchor fallibility, temporal continuity and the social dimension of linguistic meaning we now turn to an attitude report with proper names in the complement clause of its attitudinal verb.

(8) John believes that Mary is in Paris.

- For all three names in this sentence, *John*, *Mary* and *Paris*, the principles hold we have articulated for *Mary* and *Paris* in ‘Mary is in Paris’:
 - ▶ To make a standard use of a name *N* the speaker *S* must have an *N*-labeled ER;
moreover, when *S* uses *N* on the basis of this ER, then her use refers to the entity represented by this ER.
 - ▶ the interpreter *H* of *S*’s use of *N* must have an *N*-labeled ER to interpret *S*’s use of *N*;
when *H* doesn’t have such an ER, he must accommodate one.

Attitude Reports with Proper Names

- But the use and interpretation of names in the complements of attitudinal verbs – here: *Mary* and *Paris* – involve a further principle.
- This principle concerns the mental state of the attributee of the attitude report:
 - ▶ The attributee must have an ER for the referent of S's use of *N*.
 - ▶ This ER need not be *N*-labeled. (An example follows.) But it must be linked as coreferential with the ER that the speaker relies on in her use of *N*.
- Thus the mental state that S must be in to use (8) is as in (9)

Attitude Reports with Proper Names

- Note the non-empty Link Set in the 4th argument slot of *Att*.

This says that according to S the displayed ERs in her attribution to John are coreferential with her own ERs for Mary and Paris.

- (That this is indeed the effect of the links $\langle w,m \rangle$ and $\langle c,p \rangle$ is made explicit in the model theory for the DRS languages of MSDRT.)

In these lectures there won't be time to say much about the model theory. But see the text 'Introduction to MSDRT' on the website of these lectures.)

Attitude Reports with Proper Names

- Likewise, a recipient H of S's utterance of 'John believes that Mary is in Paris.' must interpret it as attributing to the attributee a mental state with ERs for Mary and Paris.
- As noted in connection with the interpretation of 'Mary is in Paris.', the ideal case is that where H will have name-labeled ERs for John, Mary and Paris.

And if H trusts S, then his interpretation will extend his mental state with a belief that what S says about John's mental state is true.

- The central part of the content specification of this belief of H will also be an *Att*-predication that attributes a mental state to John which contains ERs for the Mary and Paris that S has referred to. And these ERs will be linked to H's own ERs for Mary and Paris.

Attitude Reports with Proper Names

- We have also seen that it is possible for the interpreter H of the utterance of a name N not to have a suitable N -labeled ER.

In this case H will have to accommodate such an ER.

H will then have to link the ER for the referent of N that he attributes to John with this accommodated ER.

Attitude Reports with Proper Names

- (16.b) is an example that the use of a name N in the complement of an attitudinal verb doesn't require that the attributee have an N -labeled ER for the referent.

(10)

- a. One of the people at work, who saw you at the party last night, came all the way to the seventh floor today to ask if I knew who you were. He seems to think you are pretty cute. But I said I couldn't give him your name or address without asking you first.
- b. One of the people at work, who saw Ellen at the party last night, came all the way to the seventh floor today to ask if I knew who she was. He seems to think she is pretty cute. But I said I couldn't give him her name or address without asking her first.

Iterated Attitude Attributions

- MSDRT can represent iterated attributions, such as (11).

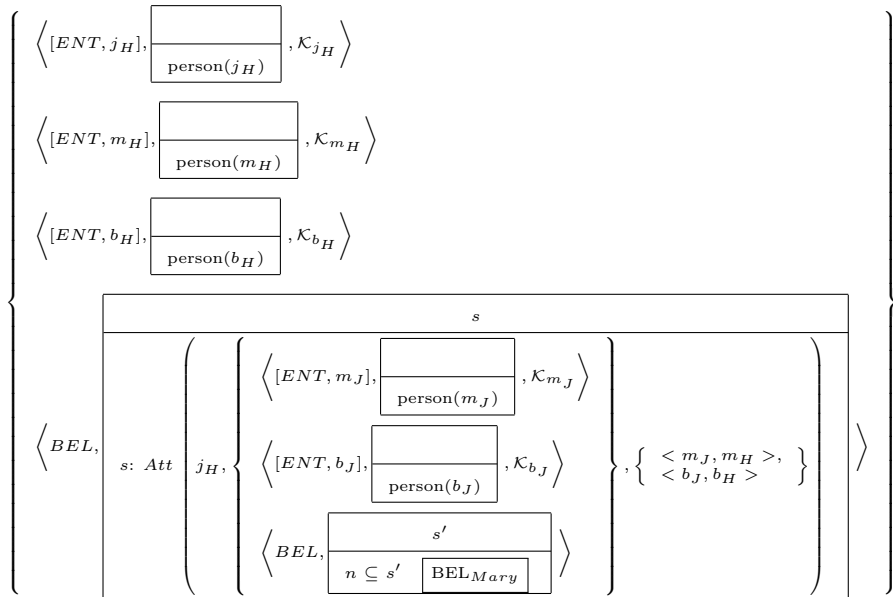
(11) John believes that Mary believes that Bill is sick.

- The next two slides show the representation that an interpreter H will construct for this sentence.

This comparatively simple example should suffice as an illustration of the general pattern.

The representation is shown on the next two slides.

Iterated Attitude Attributions



Iterated Attitude Attributions

- Here is the part referred to above as $\boxed{\text{BEL}_{\text{Mary}}}$:

(12)

$$s':\text{Att} \left(m_J, \left\{ \left\langle [ENT, b_M], \boxed{\text{person}(b_M)}, \mathcal{K}_{b_M} \right\rangle, \left\langle BEL, \boxed{\begin{array}{c} s'' \\ n \subseteq s'' \\ s'': \text{sick}'(b_M) \end{array}} \right\rangle \right\}, \{ \langle b_M, b_J \rangle \} \right)$$

Empty Names in the Complements of Attitudinal Verbs

- So far, our treatment of utterances involving names assumed that those names were names of real people and things.
- In that treatment the focus has been on the constraints that the use of such names imposes on producer and interpreter.
- But it is also possible to use empty names in attitude reports.
- In analytic philosophy of language such reports have received much attention.
- Prominent among these has been the name *Vulcan*.

Vulcan was introduced as the name of a planet; but as it turned out, the planet it was meant to name didn't exist.

Empty Names in the Complements of Attitudinal Verbs

- I expect that most of you are familiar with the case of *Vulcan*, as Kripke presented it in *Naming and Necessity*, and as others who have taken up the case after him have assumed as well:

The 19th century French astronomer Le Verrier hypothesized that hitherto unexplained deviations in the motions of the planet Mercury from the predictions made by the Newtonian model of our Solar System were due to the presence of another planet nearby, which thus far had not yet been sighted.

- Le Verrier called this planet ‘Vulcan’.

Empty Names in the Complements of Attitudinal Verbs

- From a Kripkean perspective what Le Verrier did when he introduced the name *Vulcan* came to this:
- He gave what he took to be necessary and sufficient conditions to single out the planet whose existence he assumed uniquely, and stipulated that this planet go by the name ‘Vulcan’.
- After this introduction of the name it was possible for it to spread through the community, in the manner proper names can do this.

Empty Names in the Complements of Attitudinal Verbs

- Note in passing: Le Verrier's introduction of *Vulcan* is an instance of how names can be introduced as part of giving definitions.
- Every definition needs a name for what it defines.
- Other examples of this, but where the introduction of the name was successful:
 - ▶ Le Verrier's own definition of Neptune as the planet responsible for deviations in the motions of Uranus.
 - ▶ The definition of *Euler's Constant* as the base of the natural algorithm (Euler's definition, our name).
(This is just one of countless such definitions in mathematics.)

Empty Names in the Complements of Attitudinal Verbs

- As just noted, an empty name like *Vulcan* can spread through the speech community in much the same way that non-empty names can.
- In particular, transfer from a speaker S to a recipient H will work just the same when they both believe that the name does properly refer.
- I assume that for some period of time after Le Verrier introduced the name *Vulcan* there were many who shared the belief that *Vulcan* did refer to a real planet.

Empty Names in the Complements of Attitudinal Verbs

- In the following discussion we will look at two attitude attributing sentences in which *Vulcan* occurs, focusing for the most part on the first.

(13) a. Le Verrier assumed that Vulcan is closer to the sun than Mercury.
 b. Le Verrier assumed that Vulcan is farther from the sun than Mercury.
- For those familiar with the history of the case (13.a) has the ring of truth, as opposed to (13.b), which seems false.

The reason is intuitively clear:

It was part of Le Verrier's calculations that if Vulcan was to explain the deviations observed in the motions of Mercury, then it had to be closer to the sun than Mercury.

Empty Names in the Complements of Attitudinal Verbs

- But how can (13.a) be true?

The complement clause of *believe* contains the empty name *Vulcan*.

So its content cannot be a well-defined proposition.

(The proposition about some particular thing that it is closer to the sun than Mercury is.)

- To get a better grip on this question it will help to distinguish between two different settings in which (13.a) and (13.b) can be used:
 - (i) a setting in which both the speaker S and her listener H believe in the existence of Vulcan;
 - (ii) a setting in which S and H do not believe that Vulcan exists;

Empty Names in the Complements of Attitudinal Verbs

- Our central concern will be the puzzling fact that it seems possible to use (13.a) to make what appears to be a true statement.
- Note in this connection that when an empty name occurs in a statement that is not an attitude attribution, the statement will not be judged true. For an example take an utterance of (14).

(14) Vulcan is closer to the sun than Mercury.

For someone who knows that *Vulcan* is an empty name this statement cannot be true.

- (Note well, this verdict about the occurrences of empty names outside attitude attributions does not straightforwardly apply to names in fiction. More about fictional names in the fourth lecture.)

Empty Names in the Complements of Attitudinal Verbs

- Consider our first setting, in which S and H share Le Verrier's assumption that there exists a planet with the properties he ascribed to Vulcan.

And let us assume – counterfactually, but for the sake of argument – that the belief about Vulcan's existence that S and H both shared with Le Verrier at the time when S uttered (13.a) was actually true.

- On this assumption the treatment of (13.a) should be just like our earlier treatment of 'John believes that Mary is in Paris':
- For S this means that
 - (i) she must have Entity Representations labeled by *Le Verrier*, *Mercury*, *the Sun* and *Vulcan* for Le Verrier, the planet Mercury, the sun and what she believes to be the planet identified and named by Le Verrier and
 - (ii) S herself must have the belief that at some time in the past Le Verrier held the belief she attributes to him.

An MSD for S is shown on the next two slides.

Empty Names in the Complements of Attitudinal Verbs

(15) $\left\langle \left[ENT, l_S \right], \begin{array}{|c|} \hline \\ \hline person(l_S) \\ Named(l_S, Le\ Verrier) \\ \hline \end{array}, \mathcal{K}_{l_S} \right\rangle$

$\left\langle \left[ENT, m_S \right], \begin{array}{|c|} \hline \\ \hline planet(m_S) \\ Named(m_S, Mercury) \\ \hline \end{array}, \mathcal{K}_{m_S} \right\rangle$

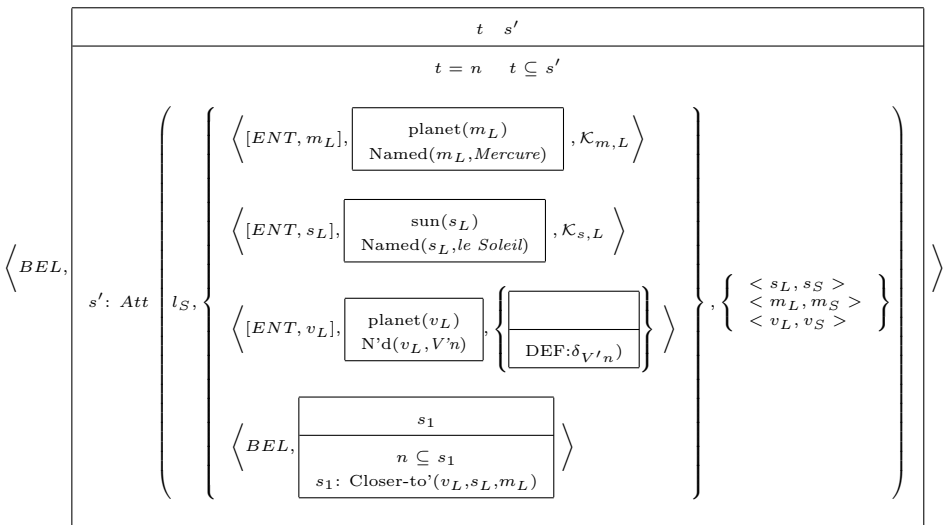
$\left\langle \left[ENT, s_S \right], \begin{array}{|c|} \hline \\ \hline star(s_S) \\ Named(s_S, the\ Sun) \\ \hline \end{array}, \mathcal{K}_{s_S} \right\rangle$

$\left\langle \left[ENT, v_S \right], \begin{array}{|c|} \hline \\ \hline planet(v_S) \\ Named(v_S, Vulcan) \\ \hline \end{array}, \left\{ \begin{array}{|c|} \hline \\ \hline DEF: \delta_{Vulcan} \\ \hline \end{array} \right\} \right\rangle$

$\langle BEL, [L.V.'s\ belief\ acc.\ to\ S] \rangle$

Empty Names in the Complements of Attitudinal Verbs

The belief content [L.V.'s belief acc. to S] from the MSD on the last slide:



Empty Names in the Complements of Attitudinal Verbs

- Three comments on the representation of these last two slides:
 1. I have assumed that S's anchor for her ER for Vulcan is the definition that Le Verrier used to introduce the name *Vulcan*.
This is a third type of anchor, distinct from both perceptual and vicarious anchors.
 2. The verb *assume* has been treated as a doxastic verb, with the same lexical semantics as we adopted for *believe* last week.
I am ignoring semantic distinctions between *assume* and *believe*.
 3. According to the representation on the last slide, S assumes that Le Verrier has for Mercury, the sun and Vulcan ERs that are labeled by their names in French.
According to what we said in connection with the treatment of 'John believes that Mary is in Paris' this is not required.
- But here the assumption seems very plausible. (For more on this see below.)

Empty Names in the Complements of Attitudinal Verbs

- If H also believes that Vulcan exists and also accepts S's attribution to Le Verrier as true, then his interpretation of S's utterance will lead to a mental state whose relevant part is like the one shown for S.

(But with one further addition: H will have entered vicarious anchors witnessing his interpretation of S's uses of *Mercury*, *the Sun* and *Vulcan* into the Anchor Sets of his ERs labeled with these names.)

Empty Names in the Complements of Attitudinal Verbs

- What are we to make of this treatment of S's utterance and H's interpretation of it?
- S and H have done everything in accordance with MSDRT's rules for the use and interpretation of attributions with names.
- But clearly something isn't right with the representation that S must have and the one that H constructs.

There is no Vulcan, so the *Vulcan*-labeled ERs of S and H aren't what S and H take them to be.

Their Anchor Sets are corrupted and do not link them to an existing thing.

Empty Names in the Complements of Attitudinal Verbs

- One consequence of this is that the belief which S attributes to Le Verrier is ‘undefined’:

This belief is supposed to be a belief about an entity that goes by the name ‘Vulcan’ and that S represents by her own *Vulcan*-labeled ER.

(Note the link between the distinguished dref of Le Verrier’s *Vulcan*-labeled ER and the distinguished dref of S’s own *Vulcan*-labeled ER in the Link Set of the *Att*-predication in her representation of Le Verrier’s belief.)

- But there is no such entity; so there cannot be any belief about it.
- In other words, the specification of the content of Le Verrier’s belief that is part of S’s own belief about Le Verrier has no well-defined truth conditions.

We repeat this last point on the next slide:

Empty Names in the Complements of Attitudinal Verbs

- S's specification of the belief that she attributes to Le Verrier has no well-defined truth conditions.
- So the content specification of S's own belief that Le Verrier has the belief she attributes to him contains an ill-defined content.
- Likewise there is no definite truth-conditional content to the sentence S utters to express her belief that Le Verrier has such a belief.
- Nor is there any well-defined truth-conditional content to H's interpretation of that utterance.
- And yet there is something that is right about S's attribution to Le Verrier and to H's interpretation, something that wouldn't have been right if S had uttered (13.b) instead.

(Recall: (13.b) is the sentence 'Le Verrier assumed that Vulcan was farther from the sun than Mercury'.)

Empty Names in the Complements of Attitudinal Verbs

- But how can we cleanly separate what is right about S's attribution from what is wrong about it?
- To get clearer about an answer to this question, we now consider a speaker S of (13.a) and a listener H living today, who both know that Le Verrier was wrong in his assumption that there is such a planet as Vulcan.
- Again we assume that S has labeled ERs for Le Verrier, Mercury and the sun, as in our previous setting.
- But S doesn't have such a *Vulcan*-labeled ER, for she knows that there is no Vulcan.
- Of course, speakers must have representations of some kind for empty names too. Otherwise they wouldn't be able to use those names.
- But what could those representations be like?

ERs and Pseudo-ERs

- The answer to this question proposed by MSDRT is that when an agent believes of a name N that it doesn't properly refer, she will have a *pseudo-ER* for it.
- A *pseudo-ER* is a representation of the form $\langle [ENT, \alpha], K, \mathcal{K}, -real \rangle$, where:
 - ▶ $\langle [ENT, \alpha], K, \mathcal{K} \rangle$ has the form of an N -labeled Entity Representation. (So K includes the Condition 'Named(α, N)'.)
 - ▶ The final constituent '-real' is a feature indicating that the agent does NOT take the name to be referring.

ERs and Pseudo-ERs

- Formally, it is the feature ‘-real’ that distinguishes pseudo-ERs from ERs.
- We can make this more explicit by adding the feature ‘+real’ to ERs that the agent does take to properly represent.
- That is, we now adopt the 4-tuples $\langle [ENT, \alpha], K, \mathcal{K}, +real \rangle$ and $\langle [ENT, \alpha], K, \mathcal{K}, -real \rangle$ as the official notation for ERs and pseudo-ERs.

But we continue to employ the 3-place notation $\langle [ENT, \alpha], K, \mathcal{K} \rangle$ that we have used so far as a convenient shorthand for the first of these.

- In certain applications it will be useful to distinguish a third type of Entity Representation in addition to ERs and pseudo-ERs.

This third type indicates that the agent is undecided whether her ER does properly represent or doesn't.

The feature that distinguishes this type from the other two is ‘?real’.

(Who has a good name for ERs with the feature ‘?real’? Any ideas?)

ERs and Pseudo-ERs

- A setting in which ‘?real’-featured ERs naturally arise is when scholars debate whether a name like *Jonas*, *Gilgamesh* or *King Arthur* was the name of a real person or ‘merely’ a mythical character.
- Scholars participating in such debates can, at any one time, be divided into three categories:
 - (i) those who believe that the name *N* is the name of a historical figure,
 - (ii) those who believe that it names a ‘merely mythical’ figure; and
 - (iii) those who have no fixed opinion either way.
- In the course of such debates scholars will often change their view, changing the ‘reality feature’ of their ER, for instance from ?real to either +real or -real.

(I take this to be yet another way in which ERs can change without losing their identity.)

Back to Attributions with Empty Names

- With these distinctions under our belt we return to the utterance of attribution (13.a) to Le Verrier now uttered by our speaker S of today.

N.B. in the present setting the utterance sounds more natural with the irrealis form *was* than the indicative form *is*.) So the sentence we now consider is:

‘Le Verrier assumed that Vulcan was closer to the sun than Mercury.’

This difference with the original (13.a) is irrelevant to the general gist of the discussion.

- The belief that S must have in order that her utterance be legitimate and sincere is almost like the one we showed earlier for the speaker who shared Le Verrier’s his belief in the existence of Vulcan.
- But there are two differences. First, the entity representation which S associates with *Vulcan* is now a pseudo-ER:

$$\left\langle [ENT, v_S], \begin{array}{|c|} \hline \\ \hline \text{planet}(v_S) \\ \hline \text{Named}(v_S, \textit{Vulcan}) \\ \hline \end{array}, \left\{ \begin{array}{|c|} \hline \\ \hline \text{DEF: } \delta_{\textit{Vulcan}} \\ \hline \end{array} \right\}, -real \right\rangle$$

Back to Attributions with Empty Names

- Second, the connection that S assumes to exist between her pseudo-ER and the ER for *Vulcan* she attributes to Le Verrier cannot be a link $\langle v_L, v_S \rangle$ like the ones seen in Link Sets of *Att*-predications so far.
- Those links entail coreference between the agent's own entity representation and the one she attributes to the addressee; but there cannot be coreference where there is no reference.
- So we need a different kind of 'link' for the connection between S's own *Vulcan*-labeled pseudo-ER and the ER she attributes to Le Verrier.
- We call these links *pseudo-links*.
- And we represent them as pairs of the form $\langle \hat{\alpha}', \hat{\alpha} \rangle$,
where α is the distinguished dref of agent's own ER and α' the distinguished dref of the ER she attributes to the addressee.
(So in the case before us the pseudo-link is $\langle \hat{v}_L, \hat{v}_S \rangle$.)

Back to Attributions with Empty Names

- But what exactly is the relation between Entity Representations that pairs ' $\langle \hat{\alpha}', \hat{\alpha} \rangle$ ' denote?

What does an agent commit herself to by adding a pseudo-link to the Link Set of an *Att*-predication that she uses to represent an attitude attribution?

- For an answer to this question we must turn to the topic that is long overdue: that of *causal networks* and *causal chains*.
- First, note that a vicarious anchor does two things:
 - ▶ It establishes or confirms coreference
 - ▶ It establishes a connection with a corresponding ER of the agent it mentions.

Back to Attributions with Empty Names

- More in detail:

When an Interpreter H uses an ER to interpret a reference to some entity made by a speaker S, who uses a referring expression γ , then he enters a vicarious anchor into the Anchor Set of that ER.

This vicarious anchor (i) determines or confirms that the ER represents the entity S has referred to, and

(ii) makes his ER and the ER used by S in her act of reference *co*-referring (or confirms their coreference).

- But S's ER may have vicarious anchors in its Anchor Set, witnessing references by yet other speakers and thereby making her ER corefer with the ERs used by those speakers

(or confirming coreference between her ER and the ones used by those speakers).

Back to Attributions with Empty Names

- The combinations of H's vicarious anchor and those anchors establish an indirect coreference link between H's ER and the ERs of those speakers.
- In this way networks emerge that consist of coreferring ERs in the mental states of different members of the speech community.
- These networks grow with time and each has a diachronic dimension, which includes members of the community at different and even distant times.
- And at any one time t there is the 'cross-section' consisting of ERs of just those participants in a given network that are members of the community and alive at t .
- Often the ERs that are part of a network are N -labeled for some name N and are part of the network in virtue of just the use of N in referring to the entities they represent.

That is: The vicarious anchors on which the network rests are all of them witnesses of uses of N to the entity that the 'nodes' of the network (the ERs belonging to it) all represent.

Back to Attributions with Empty Names

- But MSDRT does not restrict vicarious anchoring to interpretation of names.
- Acts of reference by using other types of referring phrases can also give rise to vicarious anchors on the part of their interpreters.
- And in this way unlabeled ERs can become nodes of coreference networks as well.
- Since ER networks involve anchorings of different types by different agents at different times, there is much structure there, and much that still needs exploring.
- Some substructures of networks are linearly ordered by the relation of direct or indirect connectedness.

The causal chains that connect the users of a name N to those who were direct witnesses of the name's introduction are among these.

But in general, networks of N -labeled ERs are not linear. And almost always users of N are connected to some witness of the introduction of N by a multitude of chains (Devitt (1972) and later work).

Back to Attributions with Empty Names

- The intersubjective, network-forming effect of vicarious anchors can be seen as a side effect of their primary function to fix or confirm reference.
- But with pseudo-anchors this is not so.
- There is no reference to be fixed or confirmed.

All a pseudo-anchor can do is to confirm sameness of use.

- That is, when H thinks that the name N that S has used is an empty name, he can add a pseudo-anchor to the N -labeled pseudo-ER he will use to interpret S's use of N , as testimony of his commitment to use N in an intersubjectively similar way as S.
- But that is all there can be to his pseudo-anchor. The intersubjective link it establishes is not a side effect, but its only purpose.

Back to Attributions with Empty Names

- To summarize:
- (i) Vicarious anchors fix or confirm reference (a relation between the agent and the world.)
They also establish coreference networks, as a kind of secondary effect. (These are intersubjective relations between agents and other members of their speech community.)
- (ii) Pseudo-anchors only relate uses of expressions to the uses other speakers make of them.
- They are used *for the purpose* of creating such intersubjective connections.
- The next slide shows the representation that today's speaker must have if she is to be justified in uttering her attitude about Le Verrier.

Back to Attributions with Empty Names

$$\left\langle [ENT, v_S], \begin{array}{l} \text{planet}(v_S) \\ \text{Named}(v_S, Vulcan) \end{array}, \left\{ \text{DEF: } \delta_{Vulcan} \right\}, -real \right\rangle$$

$$\left\langle BEL, \left(\begin{array}{l} s': \text{Att} \\ l_S, \left\{ \begin{array}{l} \left\langle [ENT, m_L], \begin{array}{l} \text{planet}(m_L) \\ \text{Named}(m_L, Mercure) \end{array}, \mathcal{K}_{m,L} \right\rangle \\ \left\langle [ENT, s_L], \begin{array}{l} \text{sun}(s_L) \\ \text{Named}(s_L, le\ Soleil) \end{array}, \mathcal{K}_{s,L} \right\rangle \\ \left\langle [ENT, v_L], \begin{array}{l} \text{planet}(v_L) \\ \text{N'd}(v_L, V'n) \end{array}, \left\{ \begin{array}{l} \\ \text{DEF: } \delta_{V'n} \end{array} \right\} \right\rangle \\ \left\langle BEL, \begin{array}{l} s_1 \\ n \subseteq s_1 \\ s_1: \text{Closer-to}'(v_L, s_L, m_L) \end{array} \right\rangle \end{array} \right\} \right\} \left\{ \begin{array}{l} \langle s_L, s_S \rangle \\ \langle m_L, m_S \rangle \\ \langle \hat{v}_L, \hat{v}_S \rangle \end{array} \right\} \right) \right\rangle$$

Back to Attributions with Empty Names

- So far we have encountered pseudo-anchors only in response to the use of an empty name (viz. *Vulcan*).

Can pseudo-anchors also be used in response to other expressions that are used as if they were referring but don't?

- I do not want to exclude this possibility categorically, but see no clear benefit from it.
- So I will assume that pseudo-anchors only arise through the interpretation of name uses.

Back to Attributions with Empty Names

- Within the restricted domain of the interpretations of uses of names vicarious anchors and pseudo-anchors are in a kind of competition:
- The interpreter H of a name N will either take it to properly refer and add a vicarious anchor to the ER he has or forms for the referent of N ; or he will take S 's use of N not to refer properly and add a pseudo-anchor to his N -labeled pseudo-ER.
- In either case, the ER or pseudo-ER to which the vicarious anchor or pseudo-anchor is added will make some change to the network of N -labeled ERs and pseudo-ERs:

It will establish a new connection with an ER or pseudo-ER of another agent or it will reinforce an existing connection.

Back to Attributions with Empty Names

- Note well: whether an N -labeled ER or pseudo-ER belongs to the network is independent of whether the uses of N that provoke the adding of anchors or pseudo-anchors did or didn't refer.
- Interpreters can be wrong either way, taking non-referring uses of N to be referring or taking referring uses to be uses of an empty name.
- Intersubjective networks have to do with what members of the speech community *think* others are doing, not with what those others are doing in fact.
- When the uses of a name N are consistently taken as referring (and to its original bearer), then there won't be any pseudo-ERs among the nodes of its network.
- This situation is common enough, but it is not the only one.

Back to Attributions with Empty Names

- Take for instance the case of Mummy and Johnny talking about Santa.
- Mummy knows that Santa doesn't exist, Johnny believes that he does. He has an ER for Santa, she only has a *Santa*-labeled pseudo-ER. But she also knows that he has a *Santa*-labeled ER.
- So each time Johnny uses *Santa* when they talk, she will add a pseudo-anchor to her pseudo-ER that reinforces the intersubjective link between it and Johnny's ER.
- And Johnny for his part will add a vicarious anchor to his ER when Mummy uses *Santa* in his presence, thinking wrongly that she has a *Santa*-labeled ER too.
- But the question who of them is right and who is wrong isn't all that important for how they manage to communicate.

Back to Attributions with Empty Names

- We are now in a position to say what pseudo-links $\langle \hat{v}_L, \hat{v}_S \rangle$ stand for:
- By adding $\langle \hat{v}_L, \hat{v}_S \rangle$ to her representation of the mental state attribution she makes to Le Verrier, S expresses that her *Vulcan*-labeled pseudo-ER and Le Verrier's *Vulcan*-labeled Entity Representation **are part of the same network**.
- Note how radical this step is.

It brings the intersubjective dimension of meaning directly into the content of an attitude attribution.

- This is so for the attribution that S must make to Le Verrier in thought.

But it is so also for the truth conditions that MSDRT assigns to the attitude report she makes by uttering (14)

(‘Le Verrier assumed that Vulcan was closer to the sun than Mercury.’)

And by the same token: It equally applies to the interpretation that her interpreter H should construct as semantic representation of her utterance.

Can we be right when attributing beliefs about *Vulcan*?

- The crucial question still remains unresolved:

What is right about the utterances we have looked at of ‘Le Verrier assumed that Vulcan was closer to the sun than Mercury’

and that wouldn’t have been right had the speakers said instead that according to Le Verrier Vulcan was farther from the sun than Mercury?

- The answer to this question cannot be that the belief which S attributes to Le Verrier has the same propositional content as a belief he had in fact; for there is no such propositional content.

Can we be right when attributing beliefs about *Vulcan*?

- However, Le Verrier's belief and the one S attributes to him share something like a 'quasi-propositional content' – the one that Le Verrier wrongly thinks is the content of his belief.

This content can be defined in terms of Le Verrier's *doxastically possible worlds*:

- On this set of possible worlds the content of Le Verrier's belief that Vulcan is closer to the sun than Mercury and S's specification of that belief are *necessarily equivalent* in the sense that in any such world *w* the one is true if and only if the other is.

Can we be right when attributing beliefs about *Vulcan*?

- Note well, the doxastically possible worlds for Le Verrier are not among the worlds that are genuine alternatives to the actual world.
- They are not the worlds, for instance, in terms of which we can define the truth-conditional content of singular propositions (such as the proposition that Mary is in Paris).
- For one thing, the ‘worlds doxastically possible for Le Verrier’ are all ‘possible’ worlds in which there is a planet with the properties that Le Verrier attributed to it.

For all we know such worlds are physically impossible (impossible according to true physical theory).

- But this is an instance of a general and deep problem about the difference between physically possible worlds and epistemically or doxastically possible worlds; and that isn't something that I can go into here.

Can we be right when attributing beliefs about *Vulcan*?

- This then is the answer MSDRT proposes to the question what today's speaker S is doing (and intends to be doing) when she utters the report 'Le Verrier assumed that Vulcan was closer to the sun than Mercury':

S ascribes to the attributee Le Verrier a belief that is truth-conditionally equivalent to her specification of it *in the terms that the attributee would understand and consider right*:

There is truth-conditional equivalence throughout the set of what the attributee takes to be the (genuinely) possible worlds.

- This is not quite what is going on when this report is uttered by someone who shares Le Verrier's belief that Vulcan is an existing planet.
- This speaker intends to make a belief attribution to Le Verrier in the same sense that we earlier treated the utterance of 'John believes that Mary is in Paris.'

Can we be right when attributing beliefs about *Vulcan*?

- We have seen why she cannot succeed with this.

But we can nevertheless take her to be doing something else instead, in spite of herself:

Displaying in her specification of the belief she attributes to Le Verrier the content of that belief in the way in which he himself would or could have represented that belief.

- As far as that is concerned, she is right, in the same way that today's speaker is right.
- What she is wrong about are the possible worlds, just as Le Verrier is.

Two Comparisons

- MSDRT's proposals for the treatment of attitude attributions with names have much in common with the work of Recanati (Recanati (2016), Recanati (2014)) and that of Sainsbury (Sainsbury (2018)).
- This is so both for attributions involving properly referring names and empty names like *Vulcan*.
- But I also see a potential difference, at least with Sainsbury's *Thinking about Things*.
There are two ways in which an attributor can represent the attribution she makes to an addressee.
- The first is an attribution in thought – one that according to MSDRT she needs to have to be in a position to make a corresponding attitude report in words.

Two Comparisons

- The second is the attitude report that her attribution in thought enables her to make (legitimately and sincerely).

In order that this report can be evaluated as true or false it must be possible to see it too as *displaying* the attitude or attitudes it attributes.

But how is the display by the words related to the display in thought?

And how is it related to the general interpretation rules of the language?

Sainsbury's *Thinking about Things* doesn't provide many details.

So I am uncertain whether he could see the treatment offered here of 'Le Verrier assumed that Vulcan was closer to the sun than Mercury.' as an acceptable implementation of his more general ideas.

- But the distinction between displaying someone else's thought in mind or in language has to be addressed somewhere.
- This concludes what I have to say about Vulcan in these lectures.

What I haven't presented

- There are a number of themes closely related to those discussed today that I would have liked to discuss as well, but for which there was no time. I just list those here.

(Discussions of them can be found in the ms. 'Introduction to MSDRT' on the website of the Collège de France for these lectures.)

1. Santa. The issue here is how Mummy and four year old Johnny communicate about Santa. He believes Santa exists, she doesn't. They say things to each other like:

Johnnie: "I would like Santa to bring me a toy polar bear." Mummy: "Shall we write a letter to him together."

Such conversations mostly go smoothly, back and forth. Why? How?

What I haven't presented

2. The house on the Cornish Coast.

Hermione to Alastair, whom she hasn't seen for years:

“Your remember that house we wanted to build on the Cornish Coast twenty years ago? Well, we built **it** at last. **It** is really wonderful. You must come and see **it**.”

Here the speaker talks about what was originally just an idea and then eventually became a concrete house, which you can look at and live in.

ERs can be used to model such entities, which start out as mere concepts, and with empty Anchor Sets, and eventually turn into the prospected physical instantiations of those concepts. At that point their Anchor Sets are no longer empty

This use of ERs has proved very useful in the theory of intention, planning and action.

What I haven't presented

3. Attributions involving 'Double Vision': Hesperus-Phosphorus; London-Londres and their ilk.

These are like the second Vulcan case we have discussed in that there is a cognitive non-alignment between attributor and addressee. But the problems of double vision cases are different. One problem is the choice we make of the names available to us. Why seem (16.a) and (16.c) true to us, and (16.b), (16.d), (16.e) and (16.f) all false?

- (16) a. The ancient Egyptians believed that Phosphorus could be seen before dawn and only before dawn.
- b. The ancient Egyptians believed that Phosphorus could be seen at and after dusk and only at and after dusk.
- c. The ancient Egyptians believed that Hesperus could be seen before dawn and only before dawn.
- d. The ancient Egyptians believed that Hesperus could be seen at and after dusk and only at and after dusk.
- e. The ancient Egyptians believed that Venus could be seen before dawn and only before dawn.
- f. The ancient Egyptians believed that Venus could be seen at and after dusk and only at and after dusk.

What I haven't presented

- And then there is a gap in the introduction to MSDRT I have tried to give here that is a very large gap:

I have not found time to say anything about MSDRT's Model Theory.

- To develop a viable model theory for MSDRT proves to be a daunting task,

much more so than I had originally expected, and to an extent that might many who are confronted with it suspicious.

That matters are so complex as they are due to the several novel features of the Logical Form languages of MSDRT.

This means that we cannot just take existing definitions of models and truth definitions off the shelf.

(As had been possible for the original versions of DRT)

End of Today

THANK YOU (again)

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