Indexicality: *de se* anaphora in discourse

Lectures 4 and 5:

*De se* semantics for indexicals across languages

Today we will begin to revise the anaphoric semantics for English indexicals developed in lecture II, so that they presuppose anchoring to discourse centers, and show how this gives rise to the *de se* readings of our benchmark examples. As a preliminary, we consider some important issues about the relationship between syntactic binding (involving co-indexation) and semantic coreference and binding.

Then we turn to the semantics of indexicals in several languages that have shifted indexicals, exploring the ways in which the 1st and 2nd person pronouns in such languages vary in distribution, and conducting a preliminary exploration of parameters in their semantics which might explain this variation. The *de se* semantics first applied to English indexicals proves valuable for capturing the uniformly *de se* semantics of shifted indexicals.

1. Referential indices, coreference, and accidental coreference

I will follow Reinhart (1983) and Heim & Kratzer (1998) is assuming that syntactic coindexation has ramifications for reference, but (a) it doesn’t always entail co-reference, and (b) it is not necessary for co-reference. The reason it doesn’t entail co-reference is that it may indicate covariance under semantic binding instead. So we have:

(91) Every boy7 hid from his7 brother.

(92) John7 hid from his7 brother.

(93) John7 hid from his10 brother.

(91) will lead to a bound variable reading for *his*, along the lines familiar from Heim & Kratzer. Coindection in (92) will make *John* and *his* coreferential. But in (93), the fact that the two NPs are not coindexed leaves open the possibility that they are still coreferential, if it just happens that the assignment function that gives values to free variables like *his10* assigns as its value John. This is sometimes called “accidental coreference”. (93) can have another meaning where the two NPs are *not* understood to be coreferential, and the object is somebody else’s brother besides John’s. As Heim & Kratzer show, this makes a difference when we have ellipsis or domain restriction of *only*:
(94) John$_7$ hid from his$_i$ brother, and Chris did too.

(95) Only JOHN$_7$ hid from his$_i$ brother.

To derive the meaning of the elided VP in (94), we abstract over John in the first clause, and then apply that abstract to Chris in the second. We get two readings, depending on whether index $i = 7$ or not:

(94') $i = 7$: $\lambda x_7 . x_7$ hid from $x_7$'s brother sloppy: ‘Chris hid from Chris’s brother’

(94'') $i = 11$: $\lambda x_7 . x_7$ hid from $x_{11}$’s brother strict: ‘Chris hid from $x_{11}$’s brother’, i.e. the same person John hid from.

Similarly, in deriving the meaning of (95), we abstract on the focused subject JOHN$_7$ to derive the restriction for the exclusive implication of only, yielding the following, with the abstraction underlined:

(95') prejacent: John hid from John’s brother.

exclusive: $\forall y [\lambda x_7 . x_7$ hid from $x_i$’s brother($y$) $\rightarrow$ $y =$ John]

\begin{align*}
&i = 7: \text{No one other than John hid from his own brother.} & \text{sloppy} \\
&i = 11: \text{No one other than John hid from $x_{11}$’s brother.} & \text{strict}
\end{align*}

Summarizing: Co-indexation forces either co-binding or coreference. But non-co-indexation does not preclude coreference. In fact, the strict-sloppy ambiguity argues that you cannot conflate co-binding at LF with coreference by using coindexation for both. In order to get the strict reading in (94''), one has to understand $x_7$ and $x_{11}$ as coreferential, even though they aren’t coindexed. In discourse terms, we have to be able to equate two distinct discourse referents, $d_7 = d_{11}$, to bar the sloppy reading, yielding the strict.

There are two more matters that bear on the semantics of indexicals presented in the next section. The first has to do with the derivation of de se interpretations.

It might be assumed that the derivation of de se interpretations is driven by coindexation of the agent of the attitude with the target pronoun in the attitude complement. For example, suppose that we derive the two meanings of (52) as follows:

(52) [amnesiac context:] Ernie Banks$_4$ thinks he$_1$ is one of the greatest shortstops of all time.

(a) de se: $i = 4$: $\lambda y . y$ thinks $y$ is great

\[
\text{DOX}(<\text{eb},<t^*>,w^*>) \subseteq \{<y,t>,w>: y \text{ is great}\}
\]

(b) non-de se: $i = 7$: $\lambda y . y$ thinks $x_7$ is great, where for all CS-consistent $g$, $g(x_7) =$ EB

\[
\text{DOX}(<\text{eb},<t^*>,w^*>) \subseteq \{<y,t>,w>: x_7 \text{ is great}\},
\]

\[
i.e. \under g: \{<y,t>,w>: \text{EB is great}\}
\]

We might do this by stipulating that the derivation of the belief set is a function of the value of an abstraction over the attitude subject, as shown. In the arbitrary centered world in the derived belief set (the value of DOX(base world)), any arguments coindexed with the subject, and hence covarying under $\lambda$ in the abstraction, will have the same value as the center. When Ernie Banks
and he are coindexed in (52), this yields the de se reading; whereas when they are not, even when
the value of he is Ernie Banks, this yields the non-de se.

But there is a problem with this approach to deriving the de se. Consider:

(96) [Context: same as in (52), amnesiac Ernie Banks in the hospital. Turns out all the patients
on his ward are baseball fans. One of the occupational therapists brings in her collection
of baseball photos to show them. Later she describes what happened to a nurse:]
All the patients chose their favorite photos of baseball players in action. Ernie Banks
thought that a picture of himself in his youthful prime, in action on the field, was the best
of the lot. Ernie’s really a modest guy. I think he’ll be embarrassed when he realizes what
he’s done.

As the continuation makes clear, himself in the underlined utterance is intended to be interpreted
non-de se. But in keeping with Binding Theory Principle A, himself must be co-indexed with the
subject of the attitude predicate, Ernie Banks. In fact, Heim & Kratzer (1998:Chapter 10) argue
for the account of sloppy identity as based on coindexation, sketched above, partly on the basis
of the fact that in cases where the source VP includes a reflexive, only the sloppy reading of an
elided VP is possible. Hence, their (97) has only the sloppy reading where Mary hurt Mary:

(97) Ann hurt herself, and Mary (did) too.

And we only get the sloppy reading in their corresponding example with only, as well:¹

(98) Only Ann hurt herself.

This seems to be correct for the strict/sloppy readings. Consider your judgments about (99):

(99) Ernie Banks thought a picture of himself was the best, and Charlie Lopez did too.

If you take the second conjunct to have only a sloppy reading (as I do), then this argues that
himself in (96) has to be coindexed, i.e. syntactically bound, by Ernie Banks. But then since the
example has a non-de se interpretation, we cannot reduce the de se/non-de se ambiguity to the
presence or absence of coindexation of the relevant NPs.

And here’s another argument that coindexation isn’t sufficient to yield a de se interpretation:
quantificationally bound pronouns needn’t be interpreted de se. Consider the following variant
on an example due to Chris Collins’ (p.c. in class) (100):

(100) [Context: In the amnesia ward (there’s been an epidemic!), each of the patients was a
renowned, successful person before losing his memory. Each obsessively reads books
and articles about the famous person he was, not realizing that this was him. One nurse
tells another:]

¹ Hoji (1998) argues that this only holds for verbs which are themselves reflexive in some sense. One might get a
different result with a verb like talked about, for example. I’m not clear about my judgments in this matter. In any
case, if we use coindexation to capture syntactic binding for Principle A, the reflexives are a problem.
[Each of these guys]9 thinks he9’s great.

The non-\textit{de se} interpretation of (100) requires coindexation, for otherwise we cannot guarantee that the values of \textit{each of these guys} and that of \textit{he} co-vary as required. If you can get the non-\textit{de se} interpretation, then, as several seem to do,\footnote{I cannot claim to have clear intuitions about this example.} this argues that coindexation doesn’t entail \textit{de se}.\footnote{One might want to argue that coindexation is \textit{necessary} for the \textit{de se}. But consideration of that possibility would take us too far afield, into matters pertaining to Condition C of the Binding Theory. I’m not convinced the issue is important here.}

Then what can we say about the derivation of the \textit{de se} interpretation? I think the crux of the matter is this: The non-\textit{de se} interpretation only becomes evident in attitude contexts, which are opaque, intensional, and hence prone to the infamous shifts in interpretation associated with \textit{de re} belief attribution. E.g., in all the Ernie Banks examples above, the target pronoun occurs in the complement of \textit{thinks}, and similar examples could be constructed using other doxastically-based attitude predicates. Then, I will argue, the \textit{de se} interpretation is a special type of \textit{de re} interpretation under coreference.

The classical examples illustrating the problem of \textit{de re} belief attribution, like Quine’s (101), involve a referential NP or pronoun in a doxastic attitude complement—a clause reporting some purported belief of the subject. The problem is illustrated in examples like the following, after Quine (1956):

\begin{align*}
(101) & \quad \text{[context: Mary doesn’t know that the man she’s looking at is Ortcutt, whom in another guise she knows as the upstanding, patriotic mayor of her city. He’s currently slinking around a dingy part of town at night, wearing a slouch hat and a trench coat:]}
\text{Mary thinks Ortcutt is a spy.}
\end{align*}

How do we interpret \textit{Ortcutt} in (101) in such a way as to convey the intended truth conditions, without attributing to Mary contradictory beliefs about Ortcutt?

If we’ve already been discussing Ortcutt’s odd behavior, we could replace \textit{Ortcutt} in (101) with \textit{he}. And we find the same problem in several examples with indexicals, the first due to Stalnaker (2012). Here is his background context:

\begin{quote}
I [Stalnaker] am talking with John Perry at an APA meeting, but he is not wearing his nametag, and I am not sure who he is. I know Perry’s work, but (let’s suppose) I had never before met him. I am pretty sure the guy I am talking with is either John Perry or Fred Dretske, but I am not sure which. He is telling me what a fantastic book \textit{Knowledge and the Flow of Information} is, and I am wondering whether he is bragging or praising the work of a colleague. I believe that the person with whom I am talking thinks that \textit{Knowledge and the Flow of Information} is an excellent book, and I also of course believe that he believes that he is telling this to me (though he may not know who I am, since I am not wearing my nametag either). . . .Suppose John comes to realize that I am not sure whether he is Perry or Dretske.
\end{quote}
In this context, Stalnaker claims that Perry might utter (102):

(102) [Perry to bystander:] This guy thinks I might be Fred Dretske.

We assume that both Perry and Stalnaker know that Perry and Dretske are distinct philosophers, and that they take it that any reasonably well-informed contemporary American philosopher knows this. If we take I in (102) to denote a constant function picking out the actual speaker, Perry, in every world, then This guy thinks I might be Fred Dretske would be attributing to Stalnaker an irrational belief. But that doesn’t seem to be the case. Instead there are some worlds in Perry’s conception of Stalnaker’s belief state in which Perry qua the guy Stalnaker is speaking with is the philosopher known as Fred Dretske, but others in that state in which Perry under that same guise is a different philosopher, perhaps the one known as John Perry. This seems to be behind the intuitively correct understanding of (102). Stalnaker notes that in (102) Perry’s I will pick out Dretske in some of the worlds he takes to be compatible with Stalnaker’s beliefs. Thus, I somehow tracks something like Stalnaker’s concept ‘the person I am talking with’.

Similarly, an amused bystander, acquainted with both Stalnaker and Perry, might utter (103), while Stalnaker himself might utter (104): [these are my variants]

(103) [spoken sotto voice by an amused savvy bystander to someone who joins the group:] Stalnaker thinks Perry might be Dretske.
(104) [aside by Stalnaker to someone else standing nearby:] This guy [indicating Perry] might be Dretske, or he might be Perry.

The same problem arises for Perry in (103) and for this guy in (104) as for I in (102). Note that in all these cases we have de re interpretations of the underlined expressions: For example, the understood issue in (103) isn’t whether Stalnaker thinks the individual named John Perry is the same individual as the one named Fred Dretske, but whether the particular individual in front of Stalnaker is or is not Fred Dretske. Hence, (102) – (104) illustrate how the classic problem about identity in de re belief contexts arises not only for proper names and free pronouns, but for indexicals and demonstratives as well. That is, this problem arises whenever a doxastic operator like epistemic might or a doxastic attitude predicate like thinks takes in its syntactic scope an NP of a type usually taken to denote (in a context) a constant intensional concept, i.e. a function from worlds whose value is the same individual in each world. In these doxastic contexts, taking such NPs to be constant functions doesn’t yield the intuitive interpretation. This is because the res which is the constant value of that function has different guises, and a doxastic agent might reasonably be acquainted with the res under more than one of these guises without realizing that they are one and the res.

Note that the NPs which give rise to this puzzle are all referential, so that (on the account here) all have familiarity presuppositions. Thus, their use by the speaker in such contexts serves as an aid to the addressee in retrieving the intended res. But as we discussed earlier, the familiarity and other features of the NP which triggers the presupposition plays no role in the proffered content of the NP; arguably, its proffered content in all these cases is just the res itself (or more precisely, a constant function from worlds to that res). So the fact that the res bears the name Ortcutt in (101), or is indicated by the bystander in (101) is not part of the proffered content.
attributed to the agent. Then what’s entailed is that the agent has this attitude toward the res; what’s not made explicit is the possibility that she holds this attitude under some very limited perspective on that res, yielding a guise which may be misleading about its identity.

Aloni (2001) works out a very satisfying account of what such a perspective might be: a function which pragmatically shifts the value of the constant function, in the local context, to something that reflects the agent’s limited information—the guise alone. She doesn’t talk about how we might implement this approach in a compositional semantics. But in Roberts (2014:§6) I present Aloni’s approach and offer an implementation of it in the framework for indexicality we’re developing here, making use of the notion of perspective we discussed in Lecture 3. The reader is referred to Aloni and my ms. for details.

The import here is that this understanding of de re belief attribution, which arises in examples which have nothing to do with the de se, offers a way of explaining how the non-de se reading of a bound variable arises in examples like (100). Again, in the attitude context, the bound variable will be assigned a constant value by the relevant assignment function, acting locally like a referential expression: the relevant res instantiating that variable under a given entity in the quantificational domain (the arbitrary patient). Then the question is under what guise the (coreferential) agent identifies the res. The default guise for NPs coreferential with the agent in such contexts is the de se, so that the variable in the LF for the derived belief states will be coreferential with the center, as in (52a). But in the special contexts offered we see another possibility: the agent might only see himself as a res, without self-locating in that res—rather like a person who sees her reflection but doesn’t know it’s her. Thus, the non-de se interpretation arises on the basis of an LF with the two NPs co-indexed, but with de re belief attribution leading to a shifted interpretation of the embedded NP to reflect the agent’s limited perspective on that res. See the realization of Aloni’s perspective-shifting operator in Roberts (2015) for technical details; but the result is that the agent is in the belief state in (52b). This, then, is an argument that coindexation is necessary for the de se interpretation but not sufficient. Ultimately, self-location is a guise under which one is available to oneself.

The point of this excursion is to argue that this approach to examples like (96) and (100) is independently motivated, by examples that have nothing to do with the de se.

2. de se semantics for English indexicals

2.1 Nunberg’s schema elaborated

Nunberg (1993) maps out the architecture of the semantics of an indexical, arguing that it has three components:

- the deictic component: a function from occurrences or utterances of an expression to elements of the context of utterance. The thing indicated on any given use is the index, e.g. the demonstratum of a demonstrative, or the speaker for I or we.
- the relational component: constrains the correspondence that has to hold between the index and the interpretation. So, for example, the speaker is the index for we, but the relational
component tells us that the speaker need only be a part of the pronoun’s denotation, and may in fact be a proper subpart.

- **the classificatory component:** This is a bit of a hodgepodge; all elements play a role in determining the intended denotatum, but are non-deictic. It includes features like plurality, animacy, the content of descriptors in *that car*, *we linguists*, etc.

Then he says that interpretation of an indexical takes place in two stages

1. mapping, via the deictic component and context, from the occurrence of the word to an index
2. mapping via the relational and classificatory components, from the index to the interpretation

I would elaborate Nunberg’s characterization of the deictic component, to clarify the sense in which indexicals are perspectival, something he doesn’t discuss. On this account, all perspectival expressions presuppose (as we discussed last time):

- an origin—an ordered pair of an agent (the anchor) and a time (typically the utterance time)
- a point of view (POV), consisting of the origin plus an accessibility relation over the relevant space (actual space, the 2-D space of the discourse, doxastic space), and
- the index: determined as a function of the origin and POV, in keeping with lexical presuppositions of the particular indexical

I take it that the classificatory component should include, among other things:

- any descriptive content, for example in a demonstrative description: this acts as a presuppositional constraint on the demonstratum, as in Heim’s (1982) Descriptive Content Condition
- any selectional restrictions—recall those we discussed for *cattycorner*
- appositives,⁴ as in *we linguists*

Nunberg’s three parts of an indexical, including my elaboration of the deictic component above are all part of its Presupposed Content. And there is another presupposition all share: They all have a weak familiarity presupposition, presupposing that there is a discourse referent 𝑑 in the context of utterance, s.t. its value under a CS-consistent assignment function, 𝑔(𝑑), will be the indexical’s Proffered Content (its contribution to truth conditions).

In all cases, as well, the true origin is a location—a set of coordinates—in a multi-dimensional space-time-world coordinate system: e.g., the speaker at a spatial location at a time in the actual world. Indexicals seem to invariably anchor in the actual world. But other perspectivals, like *come* may anchor in irrealis worlds: e.g., the doxastic set of a confused agent like Ernie Banks in the examples with *come* we considered last time:

(138)  [Context: Last week, Chicago baseball player Ernie Banks was hit on the head. He is now a lucid amnesiac. After the accident, Ernie was transported to Boston to work with an

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⁴ Appositives are a type of auxiliary content—one of Potts’ (2005) supplemental conventional implicatures. Including them here isn’t to suggest that they’re part of the proffered or presupposed content of the NP modified.
amnesia specialist. For all he knows, he has never been to Chicago. He has been reading about the baseball player Ernie Banks, but does not realize that he is reading about himself. He reads that President Obama was in Chicago 3 weeks ago and met Ernie Banks. The doctor later tells her friend:

a. #Ernie believes that President Obama came to Chicago.
b. Ernie believes that President Obama traveled to Chicago.

(139) [Context: Identical to (138), except that Ernie regains his memory.]
Ernie believes that President Obama came to Chicago.

Table 1 gives an overview of the how these components of indexical meaning are realized in some of the central indexicals. Remember from last time that ©* in any context is the actual speaker at the time of utterance, an ordered pair <a, t>, with a the anchor, t the utterance time:
Table 1: Components of the meanings of some English indexicals

<table>
<thead>
<tr>
<th>Components: Indexicals:</th>
<th>Familiarity</th>
<th>Classificatory</th>
<th>Deictic</th>
<th>Relational</th>
</tr>
</thead>
<tbody>
<tr>
<td>this, that; (with demonstration)</td>
<td>$d_i$</td>
<td>(if any) Descriptive Content Cond’n on $d_i$</td>
<td>$&lt;a,t&gt; = ©^k$ for $©^k \in {©*,©_{FID}}$</td>
<td>demonstrate d vector $v$ with origin in $a$ at $t$ in $w^*$</td>
</tr>
<tr>
<td>this, that; (discourse deixis)</td>
<td>$d_i$</td>
<td>(if any) Descriptive Content Cond’n on $d_i$</td>
<td>$&lt;a,t&gt; = ©^*$</td>
<td>timeline vector $v$ with origin at $t$ in $w^*$</td>
</tr>
<tr>
<td>I</td>
<td>$d_i$</td>
<td>$\emptyset$</td>
<td>$&lt;a,t&gt; = ©^*$</td>
<td>$&lt;&lt;a,t&gt;,w^*&gt;$</td>
</tr>
<tr>
<td>we</td>
<td>$d_i$</td>
<td>$\emptyset$</td>
<td>$&lt;a,t&gt; = ©^*$</td>
<td>$&lt;&lt;a,t&gt;,w^*&gt;$</td>
</tr>
<tr>
<td>you</td>
<td>$d_i$</td>
<td>$\emptyset$</td>
<td>$&lt;a,t&gt; = ©^*$</td>
<td>$&lt;&lt;a,t&gt;,w^*&gt;$</td>
</tr>
<tr>
<td>now</td>
<td>$d_i$</td>
<td>$\emptyset$</td>
<td>$&lt;a,t&gt; = ©^k$ for $©^k \in {©*,©_{FID}}$</td>
<td>$&lt;&lt;a,t&gt;,w^k&gt;$, $w^k \in \text{Dox}(&lt;a,t'&gt;,w_{\text{interp}})$</td>
</tr>
<tr>
<td>here</td>
<td>$d_i$</td>
<td>$\emptyset$</td>
<td>$&lt;a,t&gt; = ©^k$ for $©^k \in {©*,©_{FID}}$</td>
<td>$&lt;&lt;a,t&gt;,w^k&gt;$, $w^k \in \text{Dox}(&lt;a,t'&gt;,w_{\text{interp}})$</td>
</tr>
<tr>
<td>come</td>
<td>$d_i$</td>
<td>locative adverbials, if any</td>
<td>$&lt;a,t&gt; = ©^k$ for $©^k \in {©*,©_{FID}}$</td>
<td>$&lt;&lt;a,t&gt;,w^k&gt;$, $w^k \in \text{Dox}(&lt;a,t'&gt;,w_{\text{interp}})$</td>
</tr>
<tr>
<td>demonstrative she</td>
<td>$d_i$</td>
<td>$d_i$ referred to w/ feminine gram’l gender</td>
<td>$&lt;a,t&gt; = ©^*$</td>
<td>demonstrate d vector $v$ with origin in $a$ at $t$ in $w^*$</td>
</tr>
</tbody>
</table>

5 For the indexicals, this is familiarity of the denotatum. For come, it is familiarity of the presupposed end-point of a path.
6 If the world of interpretation is one of those in the interlocutors’ CS, then since for cooperative interlocutors $x_i\ \text{DOX}(x_i) \subseteq \text{CS}$, this is a CS-world. In FID, the world of interpretation is one of the fictional worlds. In an attitude context, it is one of the worlds in $a$’s belief set, etc. Similarly, in FID or an attitude context, the time is that at which the anchor $a$ believes himself to be—the attitude time.
Some things to notice about Table 1:

- In it, I treat discourse referents as if they were type e, for simplicity.
- Facts:
  - If \(<a,t> = \mathbf{C}^*, \) then \(a\) is the speaker and \(t = t^*\) (utterance time), by the definition of \(\mathbf{C}^*\).
  - If \(<a,t> = \mathbf{C}^{FID}, \) then \(a\) is the anchoring agent of the view reported, and \(t\) is the event time of the holding of the attitude.
- A demonstrative as characterized here is partly locative, partly doxastic: It’s locative because \(a\) serves as origin of a vector \(v\) in real space (the demonstration), which plays a role in determination of the POV. It’s doxastically perspectival because the POV is that of a doxastic center (one whose agent’s doxastic perspective is contextually salient—here, because it’s \(\mathbf{C}^*\), the speaker’s POV at utterance time in the actual world).
- I have only sketched two flavors of demonstrative, those with demonstration and those involving discourse deixis. There are more subtypes. See Roberts (2002), King (2001).
- For discourse deixis, the index is a word or constituent, but the denotatum \(d_i\) is the denotation of that constituent (technically given by the CS-compatible assignments of values to variables).
- The associativity of plural \(we\), \(you\) is evident in their Relational Component, where instead of identity with the index, we find that the index (speaker, addressee) is a part of the denotation \(d_i\). It needn’t be a proper subpart: the speakers may be plural and as a group constitute the intended denotation of \(we\) (as in the Christmas Carole \(We\ Wish\ You\ a\ Merry\ Christmas\)); the same for the addressees. We’ll see how this works when it \(is\) a proper subpart.
- The only “pure” indexical on this account is \(I\). Discourse demonstratives may have quantificational or bound antecedents (technically via the constituent index); associative \(we\) and \(you\) may have non-interlocutor parts in \(d_i\) and those may be bound; and \(now\) and \(here\) are shiftable in English, at least in FID.
- There are three shiftable indexicals in Table 1, \(here\) and \(now\), and the deictic motion verb \(come\), any of which can take as anchor either the speaker or the anchoring agent of FID (which may also arise in some attitude complements). We can see this in the availability with these indexicals of two possible origins, \(\mathbf{C}^*\) and \(\mathbf{C}^{FID}\), if the latter is available in the context of utterance, and in the fact that the world of the POV is shifted in an FID context. Insofar as one permits shifting of \(here\) or \(now\) in attitude complements, the world of the POV in that case will be one of the anchor’s belief set worlds (at the time of the
This behavior parallels that of *come*, which is even more promiscuous about shifting perspective, including the world of the POV, and especially prone to do so in attitude contexts.

Now we will spell these schemas out in characterizations of the particular indexicals, which we’ll call their **Characters**, in honor of Kaplan.

Here’s a version of the semantics for proximal *this* (with demonstration) which is a bit easier to digest than the version from Roberts (2002) that we considered in lecture 1, clarifying the different components of the meaning of *this* along the lines informally sketched in Table 1. I have color-coded those aspects of the semantics according to which component of the meaning in Table 1 they correspond to:

(105) **Character of this:**

Given a context \( K = <CS_k,DR_k,\mathbb{C}_k> \):

- **Presupposed content:** Use of *this*; at time \( t \) is felicitous in \( K \) at time \( t \) just in case \( \text{there is a } d_i \in DR_k, \) and
  - \( \exists C_{i,t} \in \mathbb{C}_k \) s.t. \( C_{i,t} \) is either \( C^* \) or \( C^{\text{FID}} \), and
  - \( d_k \) at \( t \) serves as origin of an indicated vector \( v \) whose end is \( d_i \), and
  - \( d_i \) is proximal to \( d_k \) on \( v \).

- **Proffered content:** Where defined, for all CS-compatible assignments \( g \) \( \{this_i\}^{\mathbb{C}_k,g} = g(d_i) \).

Like any other anaphoric NP, the use of a demonstrative *this* (with or without nominal complement) presupposes that there is a corresponding familiar discourse referent \( d_i \), identified by the index on the demonstrative. But like *I*, it also presupposes an indexical origin, and the pov given by the indicated vector anchored in the origin. In the canonical use accompanied by a demonstration, \( C^* \)'s actual location serves as origin in a Cartesian space, so that in any CS world \( w \) there is a vector from that origin, parallel to the line of the speaker’s indicative gesture, along which, proximal to the origin, is the point at which the vector ends at the location of the the index—the demonstratum. Thus, the indicated vector conventionally suggests the intended perspective. Finally, the Relation between denotatum and index is identity.

Even in its use without accompanying demonstration and without textual/discourse deixis, *this* is most often anchored to \( C^* \), the speaker at the time of utterance in the context of utterance, though there are cases of shift with FID, as we saw in (73).

(73) John pondered all that had transpired in the past year. After the move, he thought they’d be happy here in Tulsa, but he’d been wrong, terribly wrong. And this house was part of the problem! Now he had to reconsider all their options.

Here, *this*, in lieu of a demonstration, like *here* and *now*, is anchored in the location of the FID-agent, John. The proximality understood to involve identity with the anchor’s location, at least in the extended sense of ‘in Tulsa’. As with the other indexicals, the proffered content is simply the value of the familiar antecedent \( d_i \). I.e., indexicality and point of view (in the senses defined here) are only tools for retrieving the intended antecedent, and play no role in proffered content.
Elbourne offers related examples like his (106) (2008:432) where demonstratives may be anchored to the agent of an attitude:

(106)a. Mary talked to no senator without declaring afterwards that that senator (?this senator) was the one who would cosponsor her bill.
   b. Mary talked to no senator without thinking at the time that this senator (?that senator) was the one who would cosponsor her bill.

He argues that in these examples “that and this indicate relative proximity (in temporal terms…) to Mary, the reported thinker.” But it is difficult to tell in such cases whether the shift occurs because of the embedding or, more likely, because the speaker intends us to adopt the point of view of the embedding agent, in a sort of scopally constrained FID. I know of no language in which demonstratives can be anchored to the agent of a verb of saying, unlike the shifted indexicals discussed by Schlenker et al. So I tentatively conclude that only the speaker or the agent of FID can anchor the demonstratives.

Elbourne’s general claim (p.421) is that “Third-person pronouns work similarly to we in Nunberg’s (1993) theory. The differences are that the index can be any salient object, instead of having to be the speaker, and that the relational component can fix on any salient relation, within certain limits.” Taking Nunberg’s index for a demonstrative to be “any salient object” would suggest the kind of flexibility in interpretation that we observe in local. Consider Partee’s (1989) local:

(107) After the game, every sports fan stopped at a local bar.
(108) After the game, every sports fan stopped at a bar here for a drink.

In (107) the locale may be that of the speaker, the game, or the (widely dispersed) sports fans, only the first of them corresponding with a discourse center under the rules for center introduction discussed last time. This contrasts with the behavior of here in (108), which can only be anchored to ©*. Hence, local is not indexical in the sense defined here.

So Elbourne’s approach to demonstratives ignores their true indexical nature as indexicality is characterized here. On Elbourne’s account there is no guarantee that the index will be an agent whose perspective is adopted. Hence, he has no explanation for the differences noted between demonstratives and other third person NPs. Moreover, this and that (and here) differ markedly from there, since there is merely anaphoric, not indexical. Thus, though there in (109) may be anaphoric to the previous location Tulsa, in the same context (which fails to stylistically trigger an FID interpretation) here or in this town can only be the location of utterance:

(109) John and Marcia moved to Tulsa. He thought they’d be happier there.
(110) John and Marcia moved to Tulsa. #He thought they’d be happier here/in this town.

As with I, the way in which the demonstrative is anchored to the speaker or some other center (relevance guiding the resolution of the intended anchoring center) guarantees direct reference effects. An accompanying demonstration, if any, is a conventional way of indicating to the
addressee the intended vector, though eye-movement, a nod of the head or non-gestural indication of the vector would suffice. The fact that the agent \( d_k \) intentionally serves as origin of the presupposed doxastic perspective then guarantees that the center is aware of serving in this capacity. This is a \( \text{de se} \) role. I think we find that this is the case even in FID examples like (73) and (106): The agent’s state of mind is being reported, and in that state of mind the agent intends to pick out the demonstratum.

(111) involves a bound variable reading of \textit{that car}, a case of donkey anaphora:

(111) If an insecure guy\(_6\) sees \([\text{a neighbor}_3 \text{’s new car}]_{17}\), he\(_6\) usually worries that \([\text{that car}]_{17} \) is cooler than \([\text{his}_6]_{18}\).

This, of course, does not involve a demonstration. The contrast here seems to involve empathic proximity, a type of proximity based on \textit{ego}, and hence evoked by the subject’s insecurity: the guy’s own car is \textit{his}, so part of his identity, the neighbor’s is \textit{other’s}, so not. In the hypothetical scenario established by adding the content of the \textit{if}-clause to the CG, there are these familiar discourse referents:

- \( d_6 \): an insecure guy
- \( d_3 \): \( d_6 \)’s neighbor
- \( d_{17} \): a new car owned by \( d_3 \)
- \( d_{18} \): \( d_6 \)’s car

The insecure guy serves as empathic origin for a vector from proximal (‘own’) to distal (‘other’) entities. But the corresponding discourse referent for the origin is itself arbitrary—this is not a particular guy, but a generalization over a type. So his neighbor and both cars are arbitrary, as well, their values co-varying with that of the guy. \textit{that car} has descriptive content which is easily satisfied by the discourse referent \( d_{17} \) introduced in the antecedent scenario, and the distal aspect of the determiner is consistent with the empathic distance between the guy and the neighbor’s car. The contrast with elliptical \textit{his} \(_{18}\) tends to motivate the demonstrative—what’s really under discussion is the contrast between the two cars.

A discourse demonstrative differs only in that the demonstratum—the index—is not the denotatum. Instead, the \textit{POV vector} is the time-line through discourse, the \textit{index} is a linguistic constituent at the appropriate proximal position on that time-line, and the \textit{Relational component} tells us that the denotatum is the denotation of the index:

(112) \textbf{Character of discourse deictic \textit{this}:}

Given a context \( K = \langle \text{CS}_K, \text{DR}_K, \odot_K \rangle \) with \( \odot_{k,t}^* \in \odot_K \)

\textbf{Presupposed content:} Use of \textit{this} at time \( t \) is felicitous in \( K \) at time \( t \) just in case there is a \( d_i \in \text{DR}_K \), a \( d_j \in \text{DR}_K \), and

- \( \odot^* \) serves as origin of a vector along the time-line of discourse whose end is \( d_j \), and
- \( d_j \) is proximal to \( d_i \) on that vector
- \( d_j \) is the denotation of \( d_i \).

\textbf{Proffered content:} Where defined, for all CS-compatible assignments \( g \mid \text{this} \mid_K^g = g(d_i) \).

The application to examples like (13) is straightforward:
I saw one quilt which was quite abstract, with lots of asymmetric diagonals. Another one was more traditional, worked in an old Amish pattern. This quilt was less busy than the other, but just as bold.

It’s a bit more challenging to set up donkey anaphora with discourse deixis, but I think it works in (113):

(113) If a woman has several cats in her small apartment, some more aggressive and friendly but one very insecure and shy, unless she protects this timid cat, the others will bully it mercilessly.

Now we turn to the personal indexicals. First I:

(114) **Character of English I:**
Given a context $K = \langle \text{CS}_K, \text{DR}_K, \otimes_K \rangle$ with $\otimes_K \in \otimes_K$

**Presupposed content:** Use of $I_i$ is felicitous in $K$ at time $t$ just in case there is $d_i \in \text{DR}_K$ and for all CS-consistent $g$, $g(d_i) = g(d_k)$.

**Proffered content:** Where felicitous, for all CS-consistent assignments $g$, $|I_i|^{K,g} = g(d_i)$.

Felicitous use of $I$ presupposes a familiar dRef antecedent $d_i$, which must be coreferential with the (familiar) agent of the discourse center $\otimes^*$, the current speaker, under all CS-consistent assignments $g$. Here $\otimes^*$ is the origin, and the speaker serves as the anchor and hence Nunberg’s **index**. There is no need here to specify the intended POV; the fact that the anchor is the agent of a discourse center entails that for any world of interpretation $w$ and time $t$, that agent’s perspective is $\text{DOX}(<d_i,t>,w)$ or the corresponding center’s perspective in the CG (in a Ninan-style CG with multiple centers). This will play a role in guaranteeing *de se* interpretations (modulo the problem of *de re* belief attribution we considered in the previous section). The relational component of $I$, relating denotatum/antecedent $d_i$ to index, identifies the two relata: the speaker is the denotatum. The proffered content is again very simple—it is the value under the contextually given assignment functions of the antecedent $d_i$.

Given that in any of the worlds in the CS we take the actual speaker at the utterance time to be the value of $\otimes^*$, then so long as the interlocutors know that someone is actually speaking, the deictic origin presupposition is trivially satisfied, even if they don’t know who that individual is in other respects—all that’s required to guarantee that $d_i$ is in DR is that the interlocutors know there is a speaker (in which case $i = k$), satisfying weak familiarity. The proffered content then just identifies the sense of $I_i$ with the IC which is the value under any CS-consistent assignment $g$ of the familiar $d_i$ which satisfies the anaphoric familiarity presupposition. $I_i$ thus has a sense, a function from worlds to individuals. But since its interpretation is indexically anchored to the actual speaker via $\otimes^*$, and required to have the same value as the center’s agent, then relative to any given $K, g$, $|I_i|^{K,g}$ always denotes that actual speaker. Satisfying the presuppositions of such an indexical will give it the effect of always taking wide scope over any operators introduced compositionally in the interpretation of the utterance in which it occurs—modals, attitude predicates, negation, interrogation, etc.—giving the effect of direct reference via global presupposition satisfaction, while the indexical itself stays *in situ* at LF. That is, operators in the
proffered content of an utterance only target proffered content, and here the anchoring is presupposed and necessarily globally satisfied.

The application to simple examples is straightforward:

(115) Ii am hungry.

Given a context $K = <CS_K,DR_K,©_K>$ with $©_{k,t*} \in ©_K$

**Presupposed content:** Use of $I_i$ is felicitous in $K$ at time $t$ just in case there is $d_i \in DR_K$ and for all CS-consistent assignments $g$, $g(d_i) = g(d_k)$.

**Proffered content:** Where felicitous, for all CS-consistent assignments $g$, $|I|_K,g = g(d_i)$.

The presupposed content of $I_i$ requires that there is a familiar discourse referent which refers to the speaker; the presupposition doesn’t require that the NP and familiar discourse referent bear the index $k$, just that they be coreferential with the anchor of $©^*$.

The proposed semantics for $I$ guarantees that it will always be understood *de se* in the context of utterance. A centered proposition is always understood relative to the doxastic (or purported doxastic) attitude of an agent. In embedded clauses, the agent of the attitude is the understood center, and to determine the interpretation of the complement we abstract over any arguments in the complement which are coindexed with that agent, as we saw in (52).

What about main clauses? Recall from lecture 3 that Ninan (2010) and Stalnaker (2012) take the CG to be an attitude, and the set of centered worlds in the corresponding CS are centered on an ordered set of the interlocutors. In main clauses then, the agent of the attitude, and hence the default base center is the speaker (though in FID or extended irrealis contexts, it may be some other). Suppose that the discourse is very simple—the speaker is talking to herself. Then the base centered world for the CS-attitude will be $<{a,t*},w*>$, the origin consisting of a singleton set containing $©^*$: $a$ the speaker, $t*$ the actual time of utterance, $w*$ the world of utterance. CS will consist of a set of centered worlds, the purported belief set accessible from the base. And an asserted main clause will denote a set of centered worlds, a proposed addition to the CG reflecting the base center’s purported beliefs. We derive those worlds by abstracting on any arguments in the clause’s logical form which are coreferential with the agent, here the speaker. Then the abstract is applied to the center in the specification of the object of the attitude—the proposition expressed. Here is the result for (115), the abstract underlined:

$$\{<b,t>: \lambda x \lambda t'. x \text{ is hungry at } t' (b)(t)\} = \{<b,t>: b \text{ is hungry at } t\}$$

The speaker is the anchoring agent and the CHARACTER of $I$ guarantees that it is coreferential with that agent, so the abstract binds the subject argument (and similarly for the time corresponding to present tense; see Lecture 6). The abstract is then applied to the agent and time of the derived center to yield the proposition wherein the self-locating center is hungry. Since the speaker is aware that she is the speaker and that $I$ is self-ascriptive, we have no reason to suppose that *de re* belief attribution shifts the guise to non-*de se*.

If (115) is embedded under an attitude predicate, unless the agent of the attitude is the speaker, the embedding and embedded subjects will not be coindexed, and so we will not abstract over $I$.
in deriving the object of the agent’s attitude, and hence the resulting centered proposition will be “boring” with respect to the anchoring agent:

George thinks that I_i am hungry.
\[ \text{DOX(<<g,t*>,w*>)} \subseteq \{<b,t>: \lambda x \lambda t:\text{yi is hungry at } t'(b)(t)\}, \text{i.e.} \]
\[ \text{DOX(<<g,t*>,w*>)} \subseteq \{<b,t>: \text{yi is hungry at } t\}, \text{yi the speaker} \]

What about so-called “fake” indexicals, like that in (58), the two readings based on the abstracts underlined, which differ in whether \( I \) and \( my \) bear the same referential index:7

(58)  Only I_i did my_j homework

<table>
<thead>
<tr>
<th>prejacent:</th>
<th>( I_i ) did my_j homework.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exclusive strict:</td>
<td>( \forall y[\lambda x \lambda z:\text{did } z's \text{ homework}(y) \rightarrow y = \text{speaker}] ) ( i \neq j )</td>
</tr>
<tr>
<td>Exclusive sloppy:</td>
<td>( \forall y[\lambda x \lambda x:\text{did } x's \text{ homework}(y) \rightarrow y = \text{speaker}] ) ( i = j )</td>
</tr>
</tbody>
</table>

The presupposed content in (114) does not require that any two occurrences of \( I \), even in the same utterance, be coindexed in order to be coreferential. All that’s required is that the familiar discourse referent have the same referent as that of the anchor of \( \odot^* \), i.e. refer to the current speaker. Hence, even if the two pronouns are not coindexed, they will be coreferential: in deriving the prejacent, the same interpretation will result regardless of whether \( i = j \), and there is no semantic binding in either case. In deriving the exclusive implication, typically, as in Rooth (1985,1992), Beaver & Clark (2008), we take the restriction on the universal to be a reflex of the focal structure of the utterance; but Roberts (2011) argued that this restriction cannot always be derived from the surface form or focal structure of the utterance itself. In other words, the domain restriction may or may not be derived with reference to logical form, and is essentially pragmatic. If we do take the focal structure as the primary clue to the intended domain, we consider the set of focal alternatives associated with the utterance, abstracting over the focused argument associated with \( only \)—here the subject \( I \)—to derive one of the underlined abstracts in (58). The difference between the strict and sloppy exclusives is a function of whether \( my \) is coindexed with \( I \). I take the abstraction which yields the pragmatically-given domain restriction to merely use the referential indices as a guide to determining the relevant property, without reference to either \( \varphi \)-features or any descriptive content of the NPs in the clause being abstracted over. Then there is no binding of \( my \) even in the abstract that leads to the sloppy interpretation. Abstraction simply sees \( x_i \) did \( x_i 's \) homework, and abstracts over \( x_i \).

The strict/sloppy ambiguity in VP ellipsis examples like (57) is based on the same abstractions, and so the explanation is perfectly parallel.

Before we can consider the meaning of \( we \), a short side note: Pretty much the standard semantics for plurals since the early 1980s has been that of Link (1983), wherein singular and plural

---

7 I have argued elsewhere (Roberts 2011) that the exclusive implication associated with \( only \) is that of all the contextually salient alternatives of which the prejacent is a member, the prejacent is the highest on a given pre-order over those alternatives. The arguments for the pre-order come from Beaver & Clark (2008) and would take us beyond the discussion here. For the case in point, we can take the exclusive to be as roughly stated in the text.
entities are all of the same type, so that we can take all non-quantificational NPs to be of the
same syntactic type, \( e \) (or \( <s,e> \)). Some entities are atomic; they join to form groups of properly
plural entities, all these entities in a lattice structure. The relation over the lattice is the
individual-part relation, \( \leq_i \); it is much like the subset relation in its properties. So we say that \( x \leq_i y \)
est in case, roughly, any entities that are part of (or ‘in’) \( x \) are also part of \( y \) (or alternatively, ‘\( x \)
is a subset of \( y \)’, where intuitively atomic entities are treated as singleton sets). With this
background, consider the following, preliminary semantics for \( we \):

\[
\text{(116) Character of English we: [preliminary version]}
\]

Given a context \( K = \left< \text{CS}_K, \text{DR}_K, \ominus_K \right> \), with \( \ominus^* = <d_k,t> \).

**Presupposed content:** Use of \( we_i \) is felicitous in \( K \) at time \( t \) just in case there is \( d_i \in \text{DR}_K \)
and, \( d_k \leq d_i \).

**Proffered content:** Where felicitous, for all CS-consistent assignments \( g: |we|^{K,g} = g(d_i) \).

Felicitous use of \( we \) presupposes a familiar dRef antecedent which has an individual-part that is
the current speaker. \( we \) is not semantically plural, but plural number features (ignored here) at
least implicate a non-atomic denotation. Similarly, this is an associative semantics. The speaker
must be an individual-part of the denotation, but nothing says that it be a proper individual-part.
The semantics just lead us to expect some salient group of which the (possibly atomic) speaker is
part. Nunberg points out that a given speaker is sure to be a member of many different groups.
So "the truth-conditions associated with any utterance containing \([we]\) are always underspecified
by the semantic rules of the language". I.e., the interpretation of \( we \) on a given occasion may be a
function of the speaker's intentions, the conversational purposes, and the linguistic context.
These may change even within an utterance, as in his (117):

\[
(117) \text{Wea do not know much about this part of the brain, which plays such an important part in}
\text{ourb lives, but wec will see in the next chapter. . .}
\]

Plausible intended interpretations of the indexed NPs:
\( a \) scientific community
\( b \) humanity
\( c \) author and readers, the "tour guide" convention of academic writing

But the index is the same in all three, always the speaker.

\( I \) and \( we \) interact in interesting ways, as in Partee’s well-known (118):

\[
(118) \text{Whenever I}_7 \text{ play duets with someone}_{11}, \text{ we}_{12} \text{ always play Fauré.}
\]

\[
\text{take } \ominus^* = <d_7,t>, \text{ and } d_7 \ominus d_{11} = d_{12},^8
\]

so for all CS-consistent \( g, g(d_7) \leq g(d_{12}) \)

\[
|I_7|^{K,g} = g(d_7)
\]

the dRef \( d_{11} \) corresponding to \( \text{someone}_{11} \) is introduced under the scope of

\[
\text{whenever } |we_{12}|^{K,g} = g(d_7) \ominus g(d_{11})
\]

\[
^8 \ominus \text{ is Link's 'join' relation over individuals, taking two individuals, here } d_7 \text{ and } d_{11}, \text{ and yielding a group consisting}
\text{of the two, its join in the plurals lattice.}
\]

17
The anchor for *we* is the globally accessible anchor *I*, but its non-indexical complement is the arbitrary dRef introduced by *someone*, introduced under the scope of the conditional. 9 Thus, we cannot refer anaphorically to that group after we leave the scope of *always*, so that (118′) would be an infelicitous follow-up to (118):

(118′) #We11 played again yesterday.

So in (118) the anchor is global (the speaker), but the binding of its complement in *we* is local.

But there is a class of examples that the preliminary semantics for *we* in (116) cannot handle. There are two main kinds:

A: 1st person plural pronouns in distributively interpreted VP$s$

B: 1st person plural pronouns with quantificational imposter antecedents (Rullmann 2008, 2010; Collins & Postal 2012)

The first type is illustrated by the following example:

(119) [Sally and I]7 each promised ourselves7 that we7 would be nice to the other.

(119) says that each atom of $[[Sally]] \oplus g(I)$ has the property of promising herself that she would be nice to the other atom of that group—I’m determined to be nice to Sally and she’s determined to be nice to me. So both *ourselves* and *we* have a syntactically plural antecedent—the conjoined subject—but a singular interpretation in any instantiation of the property denoted by the VP. Crucially, one instantiation consists of the atomic individual Sally, which does not include the speaker. Hence, the presupposition in (54) that the speaker is a part of *ourselves* and *we*.

How can we account for this interpretation? For Kratzer (2009),10 the two first person plural pronouns in (119) have a different status: *ourselves* is syntactically local to its antecedent *Sally and I*, and hence she would account for this via agreement; while *we* is non-local, long-distance, and so presumably she would treat this with context-shifting, as a shifted indexical. This may be plausible in (119), where the relevant indexicals are under the scope of the attitude predicate *promised*, but what about examples like the following, inspired by Rullmann (2010):

(120) We’re all experts on women until we marry one.

Here the predicate is distributive: it isn’t men collectively but the arbitrary instantiation that is an expert or marries a woman. So the subject *we* of the adverbial *until* clause is a candidate for a fake indexical. This *we* is not local to the matrix subject; so on Kratzer’s account it must be long-distance. Yet note that here there is no attitude predicate in (120). Of course, Kratzer’s account does not require that the context shifting which licenses long-distance fake indexicals only takes place in attitude complements. But then we might ask how well the context-shifting is motivated.

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9 Note that as with split-antecedents generally, as long as all the members of the group are salient, that suffices to satisfy weak familiarity, which does not require that the group have been mentioned *qua group* prior to anaphora.

10 I don’t believe Kratzer considers plural fake indexicals, but her account would, in principle, extend to these.
In all the languages in which shifted indexicals are attested, the only contexts in which this is licensed is in the complements of certain attitudes (see the inventory of attested contexts in the shifting languages in the next section). This is also the case in English, where the only utterance-internal shifting is of here and now in FID-like attitude complements.

Moreover, the Kratzer account does not extend to cases like (121) (revised from Rullmann 2010), where the apparent antecedent each of us men is an imposter in the sense defined in Collins & Postal (2012):

(121) Each of us men is an expert on women until we marry one.

The subject NP as a whole is third person and quantificational (as reflected in agreement with is), yet it seems to bind the first person plural we, reflecting the partitive quantifier’s 1st person plural domain complement us.

Rullmann (2010) makes a proposal for the semantics of we which can account for examples like (120) and (121), with a minor modification of (116):\footnote{This is not the precise form of the proposal in Rullmann (2010). See the original. However, I think I have retained its essence.}

(122) \textbf{Character of English we}: \textit{[final version]}
Given a context \(K = <CS_K, DR_K, \gamma_K>\), with \(\gamma^* = <d_k, t>\)

\textbf{Presupposed content}: Use of \(w_i\) is felicitous in \(K\) at time \(t\) just in case there are \(d_i, d_g \in DR_K\) s.t. \(d_g\) is a maximally salient non-atomic dRef s.t. \(d_k \leq d_g\), and \(d_i\) is the maximally salient dRef s.t. \(d_i \leq d_g\).

\textbf{Proffered content}: Where felicitous, for all CS-consistent assignments \(g\): \(|w_i|^{K,g} = g(d_i)\).

The presupposition in (116) requires a salient \(d_g\) which is a maximally salient non-atomic entity that includes the speaker, \(d_k\). I.e., \(d_g\) here plays the role of the plural group containing the speaker (the index). Then the relational component, highlighted in grey, requires that \(we\) refer to some individual-part of that salient group containing the index. Since the individual-part relation is reflexive, \(d_i\) may be that plural group containing the speaker. But in case the pronoun relation is distributive, its denotation need only be a member of such a group—speaker or other.

Why, then, can’t \(we\) in (123) denote either Mark or the speaker, instead of the group:

(123) Mark and I went to the movies
We\textsubscript{i} lost our glasses.

This interpretation is precluded because the presupposed content in (122) requires two familiar dRefs. One is a maximally salient non-atomic group; this is satisfied here by the discourse referent corresponding to the subject of the first sentence, \(d_g\) s.t. \(g(d_g) = [[\text{Mark}]] \oplus g(I)\). But \(d_i\) is presupposed by (122) to be the maximally salient dRef which is an individual-part of that group. Here, neither Mark nor the speaker is more salient than the other, or than the group...
as a whole. Hence, the only potential antecedent for \textit{we}, satisfying this presupposition, is the whole conjunction, so that \(d = d_g\).\(^{12}\)

What of the partitive imposter in (121)?

(121) Each of us men is an expert on women until we marry one.

Here \(us_g\) is associated with a non-atomic dRef \(d_g\) including the speaker; quantificational \textit{each} then ranges over atomic individual-parts of that non-atomic \textit{us}, introducing the dRef \(d_i\), which is then locally the maximally salient atomic individual part of \(d_g\). Any arbitrary instantiation of the group \(d_i\), including the speaker \(d_k\), is thus an individual member of \(d_g\), and so \textit{each} of \textit{us} can serve as the maximally salient antecedent of \textit{we}, satisfying the presupposed content in (122).

Hence, both the fake indexicals and quantificational imposter antecedents can be handled on the present account, without stipulation.

English \textit{you} has the same basic form as \textit{we}, with the exception that \textit{you} is number-neutral, not requiring semantic plurality. Ignoring the distributive examples, we have this preliminary semantics:

(124) **CHARACTER of English \textit{you}:** [preliminary version]

Given a context \(K = \langle \text{CS}_K, \text{DR}_K, \text{CS}_K\rangle\), with \(\text{CS}_K = \langle \text{dk}, t\rangle\):

- **Presupposed content:** Use of \textit{you} is felicitous in \(K\) at time \(t\) just in case there is \(d_i \in \text{DR}_K\) s.t. \(d_k \leq d_i\).

- **Proposed content:** Where felicitous, for all CS-consistent assignments \(g|\text{you}|_K^g = g(d_i)\).

\textit{You} requires a familiar DR antecedent \(d_i\) which is CS-coreferential with an entity which has an individual-part that is the current addressee. It is both syntactically and semantically unmarked for number, which makes it very flexible.

If \(g(d_k) = g(d_j)\), the interpretation of \textit{you} is singular. If not, it has a group-addresssee interpretation. In the latter case, Wechsler’s associative plural generalization still holds: as with \textit{we}, \textit{you} is not interpreted as denoting a properly plural set of addressees. Instead, it’s always understood that the denotation may include a possibly non-null complement to the addressee(s), which latter needn’t itself be plural, though it might be.

However, plural \textit{you} occurring bound in a predicate with a distributive interpretation raises the same problem for the preliminary version in (124) as we saw with \textit{we} above. Consider:

(125) You all think you are in Chicago.

\(^{12}\) Lest this explanation seem ad hoc, note that it is parallel to the explanation I have offered (Roberts 2005) for the effect observed by Evans (1977,1980), wherein free \textit{they} in (ii) can only refer to the entire group of three boys, and not to some sub-group, as opposed to its bound interpretation in (ii):

(i) Three boys were walking down the street. They were happy.

(ii) Three boys each hoped that they would win the prize.
In (125), all implies that the subject is properly plural, a group addressee. But think is an inherently distributive predicate—thinking is arguably something, like sleeping or being hungry, that only a particular organism can do. Still, (125) may have two distinct interpretations: one in which each member of the group of addressees thinks she herself is in Chicago, and another in which each member thinks all the members of the group are in Chicago (assuming, again, that being located in Chicago is an inherently distributive predicate). On either interpretation, (125) can only be true if each member of the group of addressees self-locates in Chicago. That is, it is a de te belief.

Here is how we derive the two readings of (125): Given (124), the presupposition of perspectival anchoring triggered by you guarantees that it will be anchored to ©@. But two tokens of you addressed to the same entity needn’t be coindexed in order to be coreferential. Thus we have logical forms like:

(125′) You₇ all think you₈ are in Chicago.

The all in (125) guarantees that the value of the subject you₇ is properly plural. But the plurality of the denotation of you₇ does not guarantee that the anchoring agent of ©@, the addressee itself, is itself properly plural. One might utter (125) to a friend when talking with him (alone) about a group to which he belongs. Then dk is the friend, who is part of the group represented by the DRef d₇, and d₇ is the denotation of the subject you₇. But because the predicate think is distributive, it predicates ‘thinking that you₈ are in Chicago’ of each atom of d₇.

Technically, distributive predication (like explicit adverbial each) involves implicit application of a distributivity operator D: \( \lambda P. \lambda x. \forall y[y \leq_i x \to P(y)] \) to the predicate in question:¹³

\[
D: \lambda P. \lambda x. \forall y[y \leq_i x \to P(y)]
\]

Given the predicate and subject arguments, this tells us that the original predicate must hold of each atomic individual-part of the subject-group (Link 1979, Roberts 1986). Assuming we maintain the same addressee dk throughout (125), all that’s required is that the center ©@’s agent dk be part of a group that is the denotation of d₈. Suppose that the only relevant, salient group is d₇, which contains dk. Then we assume g(d₈) = g(d₇) for all CS-consistent g, and the felicity condition on you₈ is satisfied. The interpretation is that each member of the group thinks that the group (as a whole) is in Chicago: ‘you each think the group of you is in Chicago’.

The logical form (125′) also leaves open the possibility that g(d₇) ≠ g(d₈), so long as both include the addressee dk. I think that this is not a plausible reading of (125), and that it is ruled out on pragmatic grounds: Without any distinguishing descriptive content, even if two distinct groups, both containing the single addressee, were equally salient, one couldn’t reasonably expect an addressee to know which group was intended as denotation of which token of you, and hence the intended truth conditions are not retrievable. With more (appositive) descriptive content, this type of reading seems to be available:

---

¹³ The distributivity may be part of the lexical semantics of the verb, or it may be a silent adverbial.
(126) You Army Reserve officers think you weekend warriors are the most important members of the community.

(127) You professionals all think that you golfers are a breed of gentlemen a cut above the plebian members of the bowling league.

Again, assume that the addressee stays constant in the relevant utterances. In (126) the first group containing the addressee(s) may be a proper subpart of the second (with weekend warriors a slang term for all members of the Army Reserve, including non-officers), yet the utterance is still felicitous. Or in (127), the first group, denoted by you professionals must have a non-null intersection with that denoted by you golfers (in particular, including the addressee(s)), but neither need be a subset of the other. And in both (126) and (127), the atoms of the subject denotata are reported to have a de te attitude toward the group-as-a-whole denoted by the second token of you, as predicted by this analysis.

There is also a reading of (125) where the two tokens of you are bound, represented by the logical form in (125′′). Again, adverbial all requires that the subject be properly plural; and the predicate think is inherently distributive. As in Heim, Lasnik & May (1991), we take the floated quantifier all to effectively bind the subject, so that with QR we abstract over the subject to yield the predicate shown, in this instance binding both tokens of you:

(125′′) You7 all think you7 are in Chicago.

\[ \lambda x_7 . \lambda x_7 \text{thinks } x_7 \text{ are in Chicago(you)} \]

This is the reading we want: ‘you each think that you (sg.) yourself are in Chicago’, which does not entail that the members believe the whole group is there. But there’s a problem. Each token of you in (125′′), if a true indexical, would carry the presuppositions in (124). Those require that \(d_7\) be some entity which includes the agent of \(\circ^*\). But the abstracted predicate will range distributively over members of the group denoted by you all. The predication in any instance will be of an atomic entity; but then there’s the possibility that there’s a non-null complement of \(\circ^*\) in the denotation of you all, and when the predicate applies to an element in that complement, it will fail to guarantee that \(\circ^*\) is in the denotation of the bound you.

If we modify the semantics for you in (124) in a way parallel to the final version of we in (122), we can address the problem with (125′′):

(128) **Character of English you:** [final version]

Given a context \(K = <CS_K, DR_K, \circ_K>\), with \(\circ^@ = <d_k, t>\):

**Presupposed content:** Use of you is felicitous in \(K\) at time \(t\) just in case there are \(d_i, d_g \in DR_K\) s.t. \(d_g\) is a maximally salient dRef s.t. \(d_k \leq d_g\) and \(d_i\) is the maximally salient dRef s.t. \(d_i \leq d_g\).

**Proffered content:** Where felicitous, for all CS-consistent assignments \(g\) \([you]_{K,g} = g(d_i)\).

Here, as in (122), we presuppose both a possibly non-atomic group \(d_g\) which is anchored in the addressee \(d_k\) in \(\circ^@\), and its possibly atomic individual part \(d_i\). To derive (125′′) and give it the intended interpretation, we first QR the matrix subject you, binding the coindexed matrix and
embedded subjects. This is distributively predicated of the (possibly) group-denoting you; the embedded you must just be a member of the most salient group that also contains the addressee, and the matrix subject’s denotation is that group.

Note also that think is a doxastic attitude predicate. Therefore, we expect it to take as complement a set of centered worlds. It will denote a relation between those worlds—the belief set—and the base centered world consisting of the agent denoted by the subject, the thinking-time (here present) and the world of evaluation. Then because the embedded you is coindexed with the subject, we’ll derive a belief state of the form:

$$||[\text{you think you are in Chicago}]|| = \text{think}(<d7,w>) \subseteq \{<\text{©},w'>| \text{© is in Chicago w'}\}$$

with the sense ‘you each think that you (sg.) yourself are in Chicago’; this is a de te attitude toward oneself, rather than toward the group as a whole.

The non-personal indexicals are crucially different from those considered above, in that they are not in themselves anchored to an agent. By default, now is canonically anchored to the presupposed speech time, the second element of ©*, here to the location of the agent of ©* at the time of utterance, etc. But with these English indexicals, other centers can under certain circumstances serve as their anchors—if it is understood in discourse that the speaker is adopting the perspective of a doxastic agent other than the speaker, DOX(©), where © ≠ ©*.

3. **Shifting indexicals**

As we saw in Lecture 1, with the Amharic (50) and (51), in some languages 1st and 2nd person pronouns can be shifted under certain embedding predicates to refer to the subject of the predicate.

(50) **Situation reported**: John says: ‘I am a hero’  
(D. Petros, p.c. to Schlenker)  
jˊon jˊ_gna nˊ-ŋn y_l-all  
*John hero be.PF-ISO 3M.say-AUX.3M*  
‘John says that he is a hero’

(51)  
m n amtˇ-a nd-alˇ-ŋn al-s mma-hu-mm  
*what bring.IMPER-2M COMP-say.PF-3M-ISO NEG-hear.PF-ISO-NEG*  
‘I didn’t hear what he told me to bring.’  
(lit. I didn’t hear that he said to me bring what.)  
(Leslau 1995, p. 779)

---

14 There is a thread in the recent literature that pertains to problems with Kaplan’s claim that I am here now is a logical truth, drawing on problems with examples like I’m not here right now as spoken on an answering machine. See Predelli (1998), Mount (forthcoming), among others, for discussion. I take it that the central issue in such examples is what counts as the ‘time of utterance’ (e.g., time of recording vs. time of playing). It seems likely that in such cases what’s involved is the fact that non-personal indexicals like here and now can take a shifted anchor in FID. In any case, I think these issues are orthogonal to the central theses here.
I know of thirteen languages in which such shifted indexicals have been documented in the linguistic literature. There are interesting differences between these languages, but all have counterparts of examples like (9) under verbs of saying. Some also shift 2nd person, for example under the language’s equivalent of ‘tell’, and some also shift locatives like *here*. The languages with documented shifted indexicals include Aghem (Hyman 1979), American Sign Language (ASL: Lillo-Martin 1995, Kouidobrova & Davidson 2014, Schlenker 2014), Amharic (Leslau 1995, Schlenker 2003), Gebärdensprache (DGS, a signed language: Hermann & Steinbach 2012; Hübl 2013), Japanese (Sudo 2012), Llengua de Signes Catalana (LSC: Quer 2005, 2011, 2013), Langues des Signes Française (LSF: Schlenker 2014), Lingua dei Segni Italiana (LSI: Zucchi 2004), Navaho (Speas 1999), Nez Perze (Deal 2013), Slave (Rice 1986, Anand & Nevins 2004), Uyghur (Sudo 2012), Zazaki (Anand & Nevins 2004). Most of these languages are unrelated to each other. And there are no doubt other languages with shifted indexicals in which they have yet to be carefully studied, e.g. Tamil (B. Chandrasekaran, p.c.). Table 2 summarizes the behavior of shifting indexicals in nine of these languages, those in which I had access to the most careful description of their distribution.
<table>
<thead>
<tr>
<th>Spoken languages:</th>
<th>shifting indexicals</th>
<th>Shifting predicates</th>
<th>shifting optionality</th>
<th>Shifts together</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amharic</td>
<td>1st sg</td>
<td>Vs of saying</td>
<td>optional</td>
<td>N/A</td>
</tr>
<tr>
<td>Japanese</td>
<td>1st, 2nd</td>
<td>Vs of saying</td>
<td>optional</td>
<td>yes?</td>
</tr>
<tr>
<td></td>
<td>1st</td>
<td>Vs of thinking:</td>
<td>optional</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>'consider '</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nez Perze</td>
<td>1st (s,pl), 2nd</td>
<td>'say', 'think'</td>
<td>obligatory</td>
<td>yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(but no addressee</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>with 'think', so</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1st only)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>'here', 'from here'</td>
<td>'say', 'think'</td>
<td>optional; entails</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>person shift</td>
<td></td>
</tr>
<tr>
<td>Slave&lt;sup&gt;15&lt;/sup&gt;</td>
<td>1st, 2nd</td>
<td>'tell'</td>
<td>obligatory</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>1st</td>
<td>intrans.'say'/</td>
<td>optional</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>'think'/ 'want'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uyghur</td>
<td>1st, 2nd NOM, NOM-</td>
<td>Vs of saying:</td>
<td>obligatory</td>
<td>yes?&lt;sup&gt;16&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>internal 1st</td>
<td>'accuse, 'say'</td>
<td>when licensed</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>not Acc</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1st person NOM</td>
<td>Vs of thinking,</td>
<td>obligatory</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>not Acc</td>
<td>hearing</td>
<td>when licensed</td>
<td></td>
</tr>
<tr>
<td>Zazaki</td>
<td>all</td>
<td>&lt;i&gt;vano 'say'&lt;/i&gt;</td>
<td>optional?</td>
<td>Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sign languages:&lt;sup&gt;17&lt;/sup&gt;</th>
<th>RS-marked V-s of saying</th>
<th>obligatory</th>
<th>yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASL</td>
<td></td>
<td></td>
<td>?</td>
</tr>
<tr>
<td>1st, 2nd, others</td>
<td>RS-marked attitudes</td>
<td>optional</td>
<td></td>
</tr>
<tr>
<td>DSG</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st, 2nd</td>
<td>RS-marked Vs of 'saying', attitudes</td>
<td>obligatory</td>
<td>no</td>
</tr>
<tr>
<td>'this', 'tomorrow'</td>
<td>'here'</td>
<td>none</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LSC</td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>1st, 2nd</td>
<td>RS-marked Vs of 'saying', attitudes</td>
<td>obligatory</td>
<td>no?</td>
</tr>
<tr>
<td>'this', 'tomorrow'</td>
<td>'here', 'now'</td>
<td>none</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Table 2: Shifting Languages: Partial inventory and summary of features

Prose summaries:
- Amharic: 1<sup>st</sup> person singular pronouns vary in interpretation when embedded under a verb of saying, optionally referring either to the speaker or the embedding subject’s denotation.
- Zazaki: all the classic pure indexicals (I’, ‘you’, ‘today’, ‘now’, etc.) shift under <i>vano ‘say’</i>.

<sup>15</sup>In Slave, embedded 3<sup>rd</sup> person under ‘say’ can refer to subject of ‘say’, but never to actual speaker.
<sup>16</sup>It’s not clear whether Uyghur shiftable temporals have to shift together; Sudo focuses on 1<sup>st</sup>, 2<sup>nd</sup> persons.
<sup>17</sup>The facts about some sign languages are still controversial. According to Davis & Koulidobrova, Quer, Hermann & Steinbach, you get many more mixed (non-Shift Together) cases in sign languages. Some have argued that in these languages the relevant constructions involve mixed quotation. But at least Quer argues that this is not so, and has evidence that these are not quotations in LSC; similarly Schlenker for ASL.
• Slave: under the complements of ‘say’ and ‘want’, 1st person pronouns optionally shift. Under ‘tell’, both 1st person and 2nd person pronouns obligatorily shift. No other indexicals shift. Embedded 3rd person pronouns under ‘say’ can refer to the subject of ‘say’, though (as in English) they can’t refer to the speaker in matrix clauses.

• Nez Perze: ‘I’ and ‘you’ are optionally shifted in embedded contexts, but crucially they shift together—if both occur in the same embedded clause, one shifts iff the other does too. ‘here’ also may be shifted in such contexts; but while locative shift entails person shift, person shift does not entail locative shift.

• LSC and DSG: 1st and 2nd persons obligatorily shift in the RS-marked complements of certain verbs of saying and attitude predicates. But ‘here’ never does, though ‘this’ and ‘tomorrow’ may.

• ASL: 1st and 2nd persons, other indexicals obligatorily shift in the RS-marked complements of verbs of saying, and optionally under RS-marked attitude predicates. They shift together.

• Uyghur [Turkic, Western China/Kazakhstan, work due to Shklovsky & Sudo]: in finite (but not nominalized)complements, nominative (but never accusative) subjects (1st and 2nd persons) obligatorily shift to speaker of reported context of utterance. The finiteness restriction holds even for predicates that license both nominalized and finite complements.

Schlenker’s (2003) analysis of this phenomenon in Amharic involves a feature associated with 1st person pronouns, [+/-author]. He defines this as a relation between an individual (the denotatum) and a context, and takes it to be interpreted as “a presupposition on the value of a variable”, the variable associated with the 1st person pronoun. The full account also involves a binding mechanism to guarantee that this free variable can be affected by an embedding attitude operator; see p.83 and his Appendix II for details.

Anand & Nevins (2004) argue that the shifted interpretations in Zazaki and Slave reflect the following constraints:

• Shift Together: “all indexicals within a speech-context domain must be bound by the same context”, where a speech-context domain is “the scope of a verb of saying, up to the next c-commanded verb of saying”.

• There can’t be mixed interpretations across conjuncts (i.e., even when the shifting is optional, if indexicals are shifted in one conjunct, they must be shifted in the other).

Neither of these constraints would be predicted by “pronoun-centric views” of indexical shift like that of Schlenker, i.e. accounts which deal with each token indexical independently. Instead, Anand & Nevins propose that the shifting is accomplished by operators associated with the verbs in question, which are hence “context shifting operators”, erasing the global context and replacing it with the reported-speech context to which the verb shifts. Instead of such verbs shifting an index of evaluation of the type assumed in classical Montague Grammar, where an index is a world-time pair, for Anand & Nevins the shifted index is itself of the same type as a Kaplanian context, yielding values for “author, addressee, and location” of the reported intensional context for the complement of one of the shifting verbs. Thus, in Zazaki:

Zazaki: [[[OPall[α]]]^c] = [[[α]]]^d
where $OP_{all}$ is the shifting operator corresponding to any intensional verb (one which shifts the values for all indexicals, unlike the corresponding operator in Slave which shifts only the subject parameter), $c$ is the context of utterance, and $i$ is the shifted context of evaluation (the enriched index of evaluation). This approach is supported by what happens in multiple embeddings in these languages, where one “overwrite” of the actual context by a higher verb of saying makes the parameters of indexicality for the actual context inaccessible for indexicals under a second, lower verb of saying. I.e., in the following, $c''$ cannot equal $c$:

$$[c…… ‘say’ [c′…… ‘say’[c′′…… ]]]$$

But as pointed out by Greg Kierstead (p.c.), a 3rd person pronoun in the complement of ‘say’ can refer to the subject of ‘say’, which I take to be a problem for their proposal: Normally such pronouns cannot refer to the actual speaker in unembedded contexts (a violation of binding theory). Thus, we wouldn’t expect them when embedded under ‘say’ to take the shifted indexical-anchoring ‘speaker’ as antecedent.

Some generalizations:

- Sudo notes that in the languages he considers, Uyghur and Japanese, shifted indexicals only occur in finite embedded (complement) clauses. In none of the literature noted above does one find shifted indexicals in:
  - non-complement-embedding attitude constructions (e.g. ‘according to’—Sudo)
  - nominalized complements
  - embedded questions, imperatives (e.g., per Sudo, in Japanese, not under the irrealis complementizer $yooni$, which combines with bouletics and predicates of commands)

Sudo points out that this restriction is not expected on a mixed quotation account of shifted indexicals, since these kinds of contexts do readily permit mixed quotation.

- Every language that displays shifting does so under Vs of saying (at least); and if the language also licenses shifting in the complements of other verbs, the shift under verbs of saying is more likely to be obligatory than under other attitude predicates.

- With personal indexicals, shifting is more likely to be obligatory, whereas it’s most often optional with locatives. (Though note that personal indexical shifting is not always obligatory, e.g. in Amharic.)

- When there’s more than one shiftable personal pronoun per clause, they’re likely to display Shift Together (if one shifts then they all do), as spelled out in Anand & Nevins (2004).

- When locatives are shiftable, they are less likely to have to shift together with the personal pronouns.

- All shifted pronouns are always de se/de te when shifted, except purportedly:
  - Nez Perze shifted locative indexicals (Deal p.14f).\(^\text{18}\)
  - Sudo (2010) claims that 2nd person shifted pronouns in Uyghur needn’t be de te (p.225). But think he mis-characterizes the de te. It’s not the speaker who has to know that the speaker is the person he’s referring to, but the addressee. See bottom 227/top 228 for his proposal.

\(^{18}\) I accept Deal’s claim. However, I don’t understand her example (4) that supposedly shows that ‘here’ isn’t de se: could be ‘here in the picture’, which is speaker-anchored, not shifted.
Towards an explanation of the phenomena summarized in Table 2:

The general proposal I would make in regard to shifted indexicals is that

a) The fact that they occur embedded under attitude predicates is key. Such predicates introduce a new center, corresponding to the agent of the attitude. So shifting contexts are those in which the doxastic attitude, i.e. the perspective of some agent other than the speaker is conventionally made salient.

b) Individual indexicals in individual languages are lexically marked for the range of centers they can be anchored to, serving as the presupposed antecedent which anchors their interpretations.

c) When an attitude-embedded shiftable indexical is coindexed with the agent of the attitude, it will end up anchored to that agent in the interpretation, resulting in a de se (or de te) interpretation.

To account for the observed variation across languages in the available of shiftable indexicals and their behavior, we use the following parameters of variation in indexical shifting:

- **lexical variability in anchoring**: some indexicals permit only anchoring to actual context, others to shifted contexts, and in the latter case, only some contexts license shifting, as reflected in which types of center can serve as anchor:
  
<table>
<thead>
<tr>
<th>Language</th>
<th>1st person</th>
<th>2nd person</th>
<th>locatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amharic 1st person</td>
<td>{©*,©say}</td>
<td></td>
<td></td>
</tr>
<tr>
<td>English I (as above)</td>
<td>{©*}</td>
<td></td>
<td></td>
</tr>
<tr>
<td>English now, here:</td>
<td>{©*,©FID}</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LSC:</td>
<td>{©*,©tell,©say,©think,©want, . . .}</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nez Perze:</td>
<td>{©*,©say,©think}</td>
<td>{©*,©say}</td>
<td>{©*,©say,©think}</td>
</tr>
<tr>
<td>Slave:</td>
<td>{©*,©tell,©say,©think,©want}</td>
<td>{©tell-@}</td>
<td>{©*,©say,©think}</td>
</tr>
<tr>
<td>Zazaki (all indexicals):</td>
<td>{©*,©say}</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **ranking of centers**, some indexicals must be anchored to the highest ranked available center:
  
  - LSC: unranked: purely optional shifting language; purportedly no Shift Together, but only shows combinations of a personal indexical and a locative
  - Nez Perze: obligatory re-ranking to shifted context if locative shifts; else ranking is required (Shift Together) but pragmatically given
  - Slave: ©tell > {©*,©say,©think,©want}, with further ordering contextually given; Shift Together
  - Zazaki: ©yano > ©*; Shift Together

Assume that the set of available centers is ordered, this order potentially modified with each introduction or deletion—conventionally under attitude verbs, pragmatically in FID. The restrictions on order we see in the shifting languages are captured by the rankings, sketched here:
Slave $\mathbb{D}^D$: $\langle \{\text{tell}\}, \{\text*\text{say}, \text{think}, \text{want}\}\rangle$, with further ranking of $\{\text*\text{say}, \text{think}, \text{want}\}$ as a function of order of introduction (cf. Anand & Nevins’ overwrite approach)

Zazaki $\mathbb{D}^D$: $\langle \{\text{vano}\}, \{\text*\}\rangle$

LSC, Amharic $\mathbb{D}^D$: $\langle \{\text*\}, \{\text@\}, \ldots\rangle$

The ranking constraint then becomes general: indexical elements presuppose a familiar antecedent from among the top-ranked set in $\mathbb{D}^D$.

The present proposal can account for the described behavior of 1st person indexicals in all these languages, using discourse centers, together with lexical constraints on felicitous indexical anchoring and the conventionally-driven ranking of centers. In Amharic, unlike English, it seems clear that the 1st and 2nd persons singular are not lexically constrained to be anchored by $\text*\text{or} \text{©@}$. For example, for 1st person, when embedded under verbs of saying, both of the available centers, $\text*\text{and the subordinate ©say}$, are possible indexical anchors. This might be appropriately analyzed as a lexical difference between Amharic and English indexical pronouns, unless Amharic does show shift-together effects. But partly because of these effects, a purely lexical approach is not promising for Zazaki or Slave.

In Zazaki, it seems clear that vano ‘say’ causes $\text*$ to be eclipsed in some way, so that only the local discourse center is available to serve as indexical anchor for the full range of lexical indexicals considered by Anand & Nevins; subsequent embeddings continue to eclipse higher centers. Let us assume that vano triggers not only the introduction of the discourse center corresponding to the agent of saying, $\text{©say}$, but also a re-ranking of the list of discourse centers, so that $\text{©say}$ is more highly ranked than $\text*\text{under the scope of vano}$. The lexical entries of the Zazaki indexicals considered require that they be anchored to the highest ranked center available in the context of interpretation: If $\text*$ has not been eclipsed—i.e. down-ranked, it will serve as anchor; but under vano the higher ranked $\text{©say}$ will serve as anchor.\footnote{Thanks to Greg Kierstead (p.c.), who suggested the re-ranking strategy.} Shift Together is predicted on this approach because when $\text*$ has been eclipsed, the current superordinate $\text{©say}$ is the required indexical anchor for all Zazaki indexicals. Contrast these with the Zazaki 3rd person pronoun, which is precluded from referring to the actual speaker, the agent of $\text*$, even when embedded under vano where $\text*$ is subordinate. But when embedded under vano, such a pronoun may take as antecedent the local ‘speaker’, the agent of $\text{©say}$. This is the reason for not simply assuming that in the contexts where the original $\text*$ is eclipsed the subordinate center $\text{©say}$ has temporarily become $\text*$: The 3rd person pronoun is sensitive to the difference, arguing that even under vano the context still tracks who is actually speaking. Then the 3rd person pronoun is simply lexically precluded from taking the agent of $\text*$ as antecedent.\footnote{It would be interesting to investigate the behavior of “impure” indexicals in this language—does Zazaki have the equivalent of English \textit{local}, for example—to see whether they could still be anchored to $\text*$. Like the behavior of the 3rd person pronoun, such anchoring would support the reordering strategy proposed here, as opposed to a sort of “erasure” of $\text*$ under the scope of vano.}

In Slave only 1st and 2nd person indexicals ever shift, so the Zazaki strategy just sketched isn’t applicable. Given the described distribution of shifting, it seems clear that the explanation must make use of some combination of the lexical semantics of the indexicals and the contexts which make subordinate centers available. I don’t know enough about Slave to develop a well-informed
hypothesis about how this works in the language; but just to illustrate the flexibility of the present approach, consider the following possibility: As in Amharic, 1st and 2nd person Slave indexicals are sensitive to certain kinds of shifted contexts. Let’s assume that there are three kinds of distinguished centers in this language: ©*, as for English, always corresponds to the time-slice of the actual speaker at the time of utterance. ©say/want is the agent of a saying or wanting attitude (at the event time of the attitude), and ©tell is the agent of a telling (at event time). In addition, other subordinate centers are possible, as in English. There is an order over these centers, with ©tell ranked higher than {©*, ©say/want}, which in turn are ranked higher than other subordinate centers. 1st and 2nd person pronouns are sensitive to this ranking in the resolution of a presupposed perspectival anchor: The 1st person pronoun may anchor to any of the three kinds of distinguished centers, while the 2nd person pronoun may only anchor to either ©@ or ©say/want. In the context embedded under ‘say’/’want’, either ©* or ©say/want may be optionally ranked higher than the other, as a function of pragmatic factors—not unlike English FID, the speaker may suggest she wishes the interpretation to be made from the perspective of a reported doxastic agent. When both are available, the one which is ranked more highly will serve as anchor for all 1st and 2nd person pronouns. When ©tell is available, because it is always ranked higher than other centers, including ©*, it will anchor 1st person pronouns; and 2nd person pronouns can only anchor to the embedded counterpart of ©@—the addressee of the reported telling—in those contexts. All other indexicals lexically anchor to ©* (via the utterance time t, location, etc.). Because of the ranking of the centers, and the sensitivity of 1st and 2nd pronouns to this ranking, this account captures the limited Shift Together strategy—when 2nd person pronouns shift, so do the 1st, and when a pronoun with a given person shifts, all pronouns with that person shift. As in Zazaki, this will apply across conjunctions which are under the scope of a shifting predicate. This system, at least, captures the facts as reported by Anand & Nevins.

In her account of indexical shifting in Nez Perze, Deal (2013) argues for separate shifters for person effects and for locative effects, because “locative shift entails person shift, but person shift does not entail locative shift” (p.11). Moreover, 1st and 2nd person must be interpreted de se, but locatives need not be. To account for these distinctions, we can assume that like Slave, in Nez Perze person indexicals like ‘I’ and ‘you’ are sensitive to a hierarchy of relevant centers, and that in embedded contexts either ©* or a subordinate center may be ranked higher, again as a function of pragmatic factors. Whichever one is ranked higher will control the interpretation of all person indexicals. But that leaves unexplained the behavior of Nez Perze k’ine, which Deal translates as ‘here’. k’ine behaves like the person indexicals (and unlike English there and its Nez Perze translation equivalent) in the sense that it cannot be bound, as we see in her (129). But it is different from the person indexicals in two important ways: First, it needn’t shift together with the person indexicals, as we see in Deal’s (130); the location denoted by kine in both clauses of this example is that of the speaker, though the 1st person morphology on the embedded ‘arrive’ gets the shifted interpretation where it co-refers with the matrix subject, the speaker’s friend. Second, kine needn’t receive a de se interpretation, as we see in her (131):

(129) # ke mine Obama hi-e’iq-tetu-∅, ’il’xnii-w kine hi-wsiix titooqan wherever Obama 3SUBJ-speak-HAB.SG-PRES many-HUMAN there 3SUBJ-be.PRES.PL person Wherever Obama speaks, many people are here.

[Consultant: “I don’t think you say k’ine [here]... you’re saying ke mine, ‘wherever’, so I think you have to say kon’a [there].”]
(130) [Context: my friend is calling me on his cellphone and describing his location. He is trying to make it to Lapwai, but he is lost.]

\[pro_{subj} \text{ hi-hi-ce-∅) [pro}_{subj} \text{ kine ∅-paay-ca-∅) pro 3SUBJ-say-IMPERF-PRES pro here 1SUBJ-arrive-IMPERF-PRES met’u weet’u pro_{subj} hi-paay-ca-∅ kine but not pro 3-SUBJ-arrive-IMPERF-PRES here colloquial: He says he is arriving here, but he is not arriving here. literal: He says I am arriving here, but he is not arriving here.}\]

(131) [Context: A man is visiting a city building and he sees a photograph of Bill Clinton shaking hands with someone. He doesn’t know that the picture was taken right where he was standing, some years ago.]

\[haama hi-neki-se-∅ Clinton hi-weeke k´ine] man 3SUBJ-think-IMPERF-PRES [Clinton 3SUBJ-be.PAST here The man thinks Clinton was here. Consultant: “That would be wherever the man was and wherever he saw the picture.”\]

Use of k´ine in (131) doesn’t entail that the speaker was aware that the picture was taken in the location of utterance.

It isn’t all that surprising that Nez Perze ‘here’ doesn’t track the behavior under shifting of the 1st and 2nd person pronouns in that language, since English here and its correlates in other non-shifting languages tends to behave in a shifted manner in FID, and even in FID, across languages ‘here’ and ‘then’ tend to behave differently than other FID-sensitive shifters (the latter discussed in detail in Eckardt 2014, Chapter 5). This may have a bearing on the non-de se interpretation of ‘here’ in (131). Consider a possibly related use of English here in (132) and (133):

(132) [Speaker is a man in Montreal gazing at a photo of the Budapest Chain Bridge:] It was here that I first saw my wife, walking across the bridge with friends on Sunday stroll.

(133) [Speaker is the amnesiac Rudolph Lingens, who is in the Stanford Library but doesn’t know it. He is shown a photo of the exterior of the Stanford library, which he recognizes from having read extensively about the building. Recall that in Perry’s (1979) story, Lingens has all kinds of propositional information about the guy named Rudolph Lingens:] Here is where Rudolph Lingens got lost in the fourth floor stacks.

(132) shows that there’s an extended sense of here which is anchored to the location of a salient picture (or map). (133) shows that this use is compatible with a non-de se interpretation. Could the use of kine in (131) be of that nature?

One reason I cannot confidently offer an account of the Nez Perze data is that we do not know about the extent to which kine may be used in ways that parallel English here: Can kine, like here, be used in contexts where the FID style licenses shifted anchoring to some other center than <speaker,utterance time>, as in the following English examples?:

(134) John brought his cat to stay with Louise. Here Fluffy would feel safe and comfortable while he was away.
You wouldn't believe what happened to me yesterday at the grocery store: Here I was, minding my own business, and along comes Jim.....

Note that *comes* in (135) serves to enforce the suggested adoption of the speaker’s point of view on the previous day (assuming that s/he isn’t at the grocery store in question at the time of utterance). Presumably, like FID generally, this type of shifting is pragmatically licensed. If shifting of *kíne* under the scope of attitude predicates like ‘say’ and ‘think’ were similarly pragmatic, unlike the conventionalized shifting permitted for the 1st and 2nd persons, then we might expect some independence of *kíne* in cases where the personal pronouns are conventionally shifted. Still, if that pragmatic style were adopted in a context where *kíne* occurs embedded under ‘say’ or ‘think’, pragmatically anchored to the matrix subject’s point of view, this might lead to a strong preference for a shifted interpretation of any personal indexicals, as well. Since $^\circ \text{say/think}$ had been introduced and 1st and 2nd person may optionally shift, it would be pragmatically inconsistent (and confusing) to shift the intended point of view anchoring *kíne* but not that for the shiftable personal pronouns. I cannot say whether *kíne* displays the kind of behavior we see in (134) and (135), so don’t know whether this is a plausible account of the relative independence of *kíne* in Nez Perze.

In their discussions of LSC, Quer (2011) and Schlenker (2014) assume that the language offers evidence against Shift Together; Hübl presents the same kind of evidence for DGS: In §1.3 we saw examples where the 1st person obligatorily shifts in an RS-marked complement, but ‘here’ does not, though ‘this’ may. This contrasts with ASL, where there is no evidence of mixed shift. The ASL case, insofar as it is represented correctly above, is fairly simple: Suppose that centers are ranked in this language, with $^\circ \text{SAY}$ always highest, but that either of $^\circ \text{THINK}$ and $^\circ \ast$ may be ranked higher than the other, on pragmatic grounds (whose perspective the speaker pragmatically implies she intends us to adopt in interpretation). Then the indexicals are all always anchored to the highest ranked center, explaining why in RS-marked verbs of saying all indexicals obligatorily shift, while shift in RS-marked complements of attitude predicates is optional.

In LSC and DGS the fact that the personal indexicals obligatorily shift under attitudes suggests a re-ranking of the embedding center above $^\circ \ast$, 1st and 2nd person choosing the highest-ranked center. But some locatives, like ‘here’, are like English *I* in being inflexibly lexically anchored to the actual context of utterance, in this case to the signer’s location. But as we saw in (39), ‘this’ seems to shift optionally. I take it, then, that it does not anchor to the highest $^\circ$, nor necessarily to $^\circ \ast$, but only to one of the salient centers. Languages like LSC and DGS may shed some light on the Nez Perze case, where we also saw independence of the locatives from the shifting behavior of the personal indexicals. It would be interesting to investigate whether unshifted locatives in these languages are non-*de te*.

Yet other patterns are observed in LSI (Zucchi 2004), LSF (Schlenker 2014), and in Uyghur and Japanese (Sudo 2012), with new studies about yet other languages coming out regularly. My point here is not to offer a complete account for any of these languages, but to suggest how a suitably flexible set of tools for characterizing the possibilities observed in the literature is offered by the present account. Reducing shifted indexical anchoring to either lexical semantics or to a monster operator, as most of the cited theories do, seems too restrictive. The variation and potential seems to lie in a combination of center-availability (as a function of the usual scope of
doxastic operators in a dynamic context, plus FID), language-specific distinctions between types of centers (so that, e.g., Amharic indexicals are only shifted by verbs of saying, whereas the other languages studied show a broader range of attitude-shifters), and the variable lexical sensitivity of particular indexicals to the available center types. Note that the basic elements of this account are independently motivated: Particular indexicals in different languages clearly differ in their potential anchoring. Especially, as we saw in §2, for the purposes of characterizing belief and de se interpretation, the lexical semantics of attitude predicates has been taken to relate centered worlds, hence to introduce subordinate centers as the agents of the base worlds in such relations.

But this last feature brings us back to another important fact about shifting indexical anchors. It has been claimed that in all the languages discussed above where the question has been investigated—Amharic, Zazaki, Nez Perze, LSF, and Uyghur—shifted 1st person pronouns are obligatorily interpreted de se with respect to the anchoring center (Schlenker 1999,2003; Anand & Nevins 2004, Anand 2006; Deal 2013; Schlenker 2014; Sudo 2012). On the account proposed here, the obligatory de se interpretation is just what we would expect.

One might speculate that in languages like Amharic and Slave, one motivation for the ability of embedded indexicals to anchor to subordinate centers is because the resulting logical form guarantees the de se reading. Anand (2006, section 2.6.5, pp.112ff) discusses how this leads to obviation effects in those languages and in Navaho, so that embedded 3rd person pronouns cannot be understood to refer de se to the agent of the embedding attitude. But he tells us that this does not hold in Zazaki, where the 3rd person can take a de se interpretation with respect to the embedding agent.

Comments and questions:

a. The (near?-) universal de se/de te character of shifted personal indexicals follows from anchoring to centers.

b. In Slave, Zazaki, re-ranking the centers (as opposed to eclipsing the global centers) predicts Shift Together; but 3rd person still cannot refer to ©*, as attested. So re-ranking is a better account than context-eclipse.

c. Sudo (2012): In a shifting language (where personal indexicals are flexibly anchored), the shiftability of 2nd person can be derived from the pragmatics of the embedding predicate.

Questions to ask in future work on these languages:

d. In a language like Nez Perze or Slave, in the complement clause of ‘think’, where the predicate has no pragmatic addressee but shifts speaker, how do you refer to the addressee?:

  George thinks 1st person loves you.
  ‘George thinks he loves you’

e. We also need more information generally about locatives, temporals in these languages, both (a) the extent to which they shift at all, and (b) details about where and when, including (c) whether they shift together with the personal indexicals.

f. What are the facts about FID in shifting languages?
References not on the course site:


