

INTRODUCTION TO PRAGMATICS
Lecture 5: Indexicality and Perspective

1. Introduction: The classical account of indexicality

In talking about anaphora, we have so far ignored one interesting sub-class of the anaphoric triggers: Indexicals. The core indexicals include 1st and 2nd person pronouns like English *I* and *you*, demonstratives like *this*, *that*, *these* and *those*, and temporal and locative adverbials like *now* and *here*, *tomorrow* and *yesterday*, *present*, along with their counterparts in other languages. Since the 1970s, the standard theory of the semantics of indexicals in philosophy and linguistics has been that of Kaplan (1977): an indexical is directly referential, with no Fregean sense. Its conventional content is a Character, a function taking as argument the concrete situation of utterance to yield the referent itself, the latter a concrete individual in that situation (speaker, addressee, time, etc.). In standard variants of this account in offshoots of Montague Grammar, an indexical's Character plus contextually given argument yields a constant function from worlds to individuals, i.e. one with the same value in all possible worlds (or at least, in all worlds in which that individual exists). This constant value is the intuitive counterpart of the referent on the direct reference account.

In Kaplanian accounts the notion of context of utterance can be captured formally as a function that yields, for a given context, values for a speaker, (an) addressee(s), a location and a time of utterance, plus (for demonstratives) values for indicated entities. The Kaplanian Character of an indexical takes a context as argument and returns a Content, a function from worlds to entities of the appropriate type. But unlike non-indexical expressions, the Character of an indexical always yields a constant function, so that the interpretation at any given world is always the value given by the context for the parameter relevant for that indexical.

context <i>c</i> :	specification of the linguistically relevant parameters of a context of utterance, in particular yielding values for: Speaker (<i>c</i>), Addressee(s)(<i>c</i>), Location(<i>c</i>), Time(<i>c</i>), Demonstratum(<i>c</i>)
Character:	a function from contexts to Content
Content:	a function from worlds to values

For example, the Character of *I* takes the context as argument and returns a Content, which (for any given world) is the value of the speaker at that context.

Character of *I*:
a function from a context *c* to a Content *K* (a function from worlds to values) s.t.
for all worlds *w*, $K(w) = \text{speaker}(c)$

This Character yields, at any given context, a rigid function whose value is always the speaker. Similarly, for *you* and *here*:

Character of *you*:

a function from a context c to a Content K (a function from worlds to values) s.t.
for all worlds w , $K(w) = \text{addressee}(c)$

Character of *here*:

a function from a context c to a Content K (a function from worlds to values) s.t.
for all worlds w , $K(w) = \text{location}(c)$

A proper context c is one in which $\text{speaker}(c)$ is at $\text{location}(c)$ at $\text{time}(c)$, thus guaranteeing that for any context of utterance c , *I am here now* will always be true at c , though certainly things might have been otherwise. Since the context fixes the value of an indexical for all possible worlds, this guarantees that their values will not vary even in intensional contexts—those in which the values of expressions typically *do* vary across possibilities. This explains the difference between pairs like the following:

- (1) I might have been someone else.
- (2) The speaker might have been someone else.

(1) and (2) are non-synonymous. (2) tells us that the context of utterance might have featured a different speaker from the actual one. (1) tells us that the actual speaker might have been someone other than she is. That is (1), unlike (2), isn't about the context of utterance at all. We just use the context of utterance as an argument of the Character of *I* to *yield* the individual who might have been otherwise.

We have seen this **lack of local effect** before, in the presuppositional content triggered by anaphoric elements and in the content of non-restrictive relative clauses (Potts' Conventional Implicatures). Just so, in (1) the relationship between *I* and the speaker in the context of utterance has no local effect, but just plays a role in retrieving the intended referent. And *I*, unlike *the speaker*, not only has no local effect, but it always appeals to the actual speaker, while *the speaker* may have a value that varies, as in (2), as a function of different ways the context of utterance *might have been*.

Note that Kaplan doesn't talk about the context-sensitive content of an indexical as presuppositional. But the way Character works effectively makes an indexical act like a presupposition trigger whose presupposition must always be satisfied in the global context, the context of utterance.

He offers the same arguments from scope for the indexicality of demonstratives, using examples where they are embedded under modals and in conditionals. Consider the parallels between (3) and (4):

- (3) [Stalnaker and Chomsky are sitting at opposite ends of a long table on a stage at MIT. One audience member says to another:]
If he had changed places with Noam, that guy [pointing to Stalnaker] would be a linguist.
- (4) [Laura is speaking to Calvin:] If you were speaking now instead of me, I would be a boy.

Both are false, ridiculously so. In (3), the demonstratum in the actual context of utterance is Stalnaker, and no matter the counterfactual situation, the denotation in that situation of the NP *that guy* is still going to be Stalnaker. Just because Stalnaker changes seats on the dais with Chomsky, that doesn't transform him into a linguist. The demonstrative NP *that guy* here displays parallel behavior to that of the English 1st person singular pronoun, both unshiftable in the hypothetical context introduced by the *if*-clause. To account for such behavior, Kaplan argued that demonstratives are directly referential, their meaning given directly by the context of utterance, via their Character, unmediated by a Fregean sense. Thus their interpretation doesn't shift under modality.

But while simple and elegant, there are empirical problems with the Kaplanian account of indexicality. I will argue that this motivates two significant changes to Kaplan's notion of Character, resulting in what we earlier called the CHARACTER of an indexical expression:

- First, we need to recognize **the anaphoric, presuppositional nature of the CHARACTER of an indexical**. Empirical support comes from the fact that in some cases the anaphoric presupposition of an indexical is *merely locally satisfied*, despite the fact that it has no local effect.
- Second, what is presupposed is richer than that which can be satisfied by specification of the speaker in the relevant context of utterance, and instead requires anchoring to an epistemic agent who is self-located, in a sense to be made clear below. This is to say that **indexicals are inherently *de se***.

2. Wechsler's (2010) Associative Universal and the *de se* character of indexicals

Wechsler (2010) observes that *without exception across a broad variety of surveyed languages* 1st and 2nd person pronouns universally have an **associative semantics** for their plural forms. That is, their plural forms are never interpreted to mean that there is a plural coreferential set of speakers (or addressees). Instead, it's always understood that the denotation may include a possibly non-null complement to the speaker (addressee), so that the speaker (addressee) needn't itself be plural. I.e. "there are no [plural] pronouns specialized for referring to 'only addressees' or 'only speakers'." Wechsler further argues on the basis of an extensive cross-linguistic search that conventional associative semantics is very rare in other kinds of NPs. This makes the universal associative semantics for the indexical pronouns all the more striking. It also contrasts sharply with other "phi features" of pronouns, including gender, number and case, which all display considerably greater flexibility and variation across languages.

Wechsler's (2010) associative universal:

It is a language universal that 1st and 2nd person plural pronouns are **associative**: Across all languages studied the counterparts of *we* or plural *you* are never to be understood as coreferential with a plural group of speakers or addressees, but instead only as including the indicated discourse participant (speaker or hearer). Apart from the plural indexicals, associative semantics is extremely rare across languages.

Wechsler argues that the explanation for this striking language universal is that "reference to 'addressee' and 'speaker' is not directly distinguished at all within pronoun systems." Instead, the person feature indicates self-ascription. That is "the value of the person feature (1st / 2nd

/inclusive) indicates which speech-act participant self-ascribes, instead of indicating which speech-act participant the pronoun refers to” so that “self-ascription exhausts the person semantics of [*you* and *I*]” (2010:348)

In support of his general view, Wechsler discusses at some length experimental work in psychology investigating the use of 1st and 2nd person pronouns by children in the early stages of language acquisition (up to about age 3½) and by children on the autism spectrum. Both classes of subjects have problems using and interpreting these pronouns properly. And both groups are now generally agreed to have either a not-yet-fully-developed or an impaired theory of mind, in the psychological sense of that term.

Summarizing the relevant experimental literature:¹

...we find early PRODUCTION of first person and COMPREHENSION of second person, with other combinations developing later. One aspect of this pattern has appeared particularly mysterious. In language acquisition, comprehension normally precedes production, but for the first-person forms the order is reversed: ‘As Charney points out, the production of *my* without comprehension seems illogical. The children would only be able to produce *my* in self-reference if they had already understood other speakers’ use of *my* as self-referring’ (Chiat 1986:347).

But...this pattern of acquisition is exactly what is expected if the ability to self-ascribe precedes the mastery of theory of mind. During the period before theory of mind is in place, successful pronoun use is favored for the self-ascribers, that is, for the speakers producing *I/my/mine* and the addressees comprehending *you/your/yours*.

In contrast, on the standard view it was hard to see why the acquisition of these pronouns should proceed in exactly this order. If first- and second-person pronouns were designated as referentially anchored to ‘speaker’ and ‘addressee’ respectively, then that anchoring would apply equally regardless of whether one were producing or comprehending the utterance.

In one revealing study, Loveland (1984) investigated the developmental relationship between spatial point of view and correct use of *I/you* pronouns by means of a cross-sectional and longitudinal study of two-year-olds. Loveland concluded that ‘a breakthrough in pronoun use comes at about the time the child learns that points of view can differ’ (Loveland 1984:554), and specifically claimed that children master spatial point of view first, then apply it to pronoun comprehension and production.

Wechsler (2010:359-360)

In children with autism, there is “a special difficulty with the use of first- and second-person pronouns [involving the use of person], ‘to a degree that seems out of keeping with other aspects of their language development’ (Lee et al. 1994:156).” These children tend to reverse the person feature of these pronouns, referring to themselves as *you* and an addressee as *I*. This contrasts very clearly with pronoun-use errors in children with Down syndrome: While the autistic children had more problems with person reversal but only very rarely made a case error, the Down syndrome children showed the opposite pattern. In the psychological literature, this has been correlated with the autistic children’s inability to grasp the idea that other people have distinct “conceptual perspectives”. Again, this behavior is very difficult to explain on the

¹ Recent work by Moyer et al. (2014) is critical of the work by Charney summarized by Chiat, arguing that the experiments were poorly designed and underestimate normal two-year-olds’ ability to use 1st and 2nd person pronouns correctly. However, even if this is correct, the difference between the normal children and those with autism still seems to be accepted, so far as I know.

standard theory of indexical pronouns: “On the standard theory of indexicals there is no need to take the speaker’s perspective in order to understand their utterance of a first-person pronoun. All that one needs to know is (i) who is speaking, and (ii) that a first-person pronoun refers to whoever is speaking.”

Roughly, one might say that there is evidence that for normal children producing *I* is easy, but understanding it is hard; while understanding *you* is easy, but producing it is hard. And for children with autism, grasping the distinction between 1st and 2nd person is hard. Wechsler argues that this correlates with a failure to grasp the notion of self-ascription which is central to the meanings of these pronouns.

For the ADDRESSEE to understand Mary’s use of the first person...he must infer Mary’s self-ascribed belief. He does so in roughly the same way that we as linguists have analyzed her utterance: he constructs a model of Mary’s belief state by applying the rules of the language. To construct a model of someone else’s belief state, an agent must exercise the human ability known as THEORY OF MIND, the cognitive ability to impute mental states to others and draw inferences from them (Premack & Woodruff 1978). Thus for an addressee to correctly interpret a first-person utterance requires theory of mind, while the speaker can interpret (and therefore produce correctly) her own first-person utterance without the need for theory of mind.

Similar reasoning applies to 2nd-person pronouns, only with the speech-act participants reversed...

Wechsler (2010:257)

Assuming Wechsler is right, there is nothing in the standard Kaplanian story about the Character of 1st and 2nd person plural pronouns that would lead us to expect or permit us to capture the self-ascription that underlies their associativity.

Crucially, there is evidence of other types to support his contention about the self-ascriptiveness of these pronouns, and of indexicals more generally.

3. The *de se* character of indexicals

Self-ascriptive interpretation is at the heart of a lively literature not normally associated with indexicality. This is the literature concerned with what is known as *de se* interpretation (Casteneda 1966,1967,1968; Morgan 1970; Lewis 1979b; Richard 1983; Perry 1993; Maier 2009; Ninan 2010, etc.). This phenomenon is illustrated in the following story, a slight variation on one due to Morgan (1970):

- (5) [Context: The baseball player Ernie Banks gets hit on the head and develops total amnesia. He doesn’t know his name or remember anything about his past, though he is lucid. During his long recuperation, he reads in the newspapers about a baseball player named Ernie Banks, and becomes fascinated with the guy’s career. His social worker reports to a nurse:]
Ernie Banks thinks he is one of the greatest shortstops of all time.

Though *Ernie Banks* and *he* are coreferential, (5) need not attribute to Ernie Banks awareness that he *himself* was a shortstop. In fact, it's more consistent with the facts about his situation to assume that he does *not* so self-attribute. But now suppose that Ernie is prescribed a new drug and his memory completely returns. In such a case, utterance of the same sentence by the excited social worker would likely be taken to implicate that Ernie *does* self-attribute baseball greatness; this is the *de se* reading. Notice that the two interpretations are not truth conditionally equivalent: In the context given in (5), the amnesiac, non-*de se* version is true, while the *de se* version is false. So this ambiguity would appear to motivate a semantic distinction. But it seems clear that in both interpretations the NPs *Ernie Banks* and *he* are coreferential; this shows that coreference is not sufficient to guarantee the *de se* reading. Then the question is how that reading arises, and how to model it in the semantics.

The problem of *de se* interpretations, as illustrated by (5), is a problem about how to model belief. What's at issue is not so much how the world is—we all agree with Banks that Banks is a great shortstop—as Banks' sense of where he himself fits into the way things are. There's a sense in which one's beliefs amount to a characterization of what's possible and what's true. But one aspect of what one believes is where one is located in the scheme of things. So self-attribution is about self-location in the space of possibilities consistent with one's beliefs. Banks is confused about where he is in the scheme of things.

Think of it as a matter of perspective: It's one thing to know that a woman one sees reflected in the glass of a shop window is being approached from behind by a suspicious-looking character. That's distressing, and you want to warn her. It's quite another to realize that that woman is you yourself, and that the threat is behind *you*. Then, *being* warned, you go into action in a different way. This is the difference between having a map of what's where, and having a map with a little red arrow on it that says "You are here".

A point of view in actual space, modeled as a three-dimensional Cartesian coordinate structure, can be characterized as a point in that space and a vector for which the point serves as origin (Barlew, 2013)—a location plus an orientation. Together, the coordinate structure, origin and vector amount to a way of modelling an agent's perspective in physical space. The vector suggests an accessibility relation from the vector's origin to other points ("locations") in the space—those perceptually accessible from the adopted point of view plus orientation. It is an old idea (Lyons 1977, and many other references) to extend this locative model metaphorically to model a more abstract notion of point of view and perspective. For *de se* interpretation, we can metaphorically generalize this locative model in order to characterize an agent's doxastic point of view—how they see the world as characterized in their belief state,² yielding their perspective on a matter.

In the doxastic case, the "space" is that of possibility, usually modeled in semantics as the set of possible worlds. In that space, call the origin of a doxastic point of view a (doxastic) **center** in a world, in keeping with the literature on the *de se*. A doxastic center is an ordered pair consisting of a doxastic agent—an entity capable of being in a belief state—and a time. Then the *origin* of a doxastic point of view is the ordered pair of a doxastic center and a possible world, the world in which the agent has her beliefs at that time; this is a **centered world**: $\langle\langle a, t \rangle, w \rangle$, *a* the agent, *t*

² See the Greek root δόκειν *dokein* 'to appear' 'to seem' 'to accept'. Doxastic logic is the logic of belief.

the time, w the world. Parallel with Barlew’s locative point of view, a doxastic point of view is a doxastic origin (the base centered world) plus a doxastic relation DOX, which captures the agent’s orientation in the space of possibilities. The center’s doxastic perspective from the doxastic point of view anchored in the origin $\langle\langle a,t\rangle,w\rangle$ is the agent’s belief set at t in w , the set of centered propositions they take to be true, $\text{DOX}(\langle\langle a,t\rangle,w\rangle)$. This is a specification of the (true and/or false) information to which the agent has access from that point of view, each proposition a set of centered worlds. Continuing the spatial metaphor, a doxastic point of view yields the other “points” in logical space—the other possible centered worlds—to which the center has doxastic access. These are the worlds consistent with all the centered propositions in the agent’s belief set: each of these “points” is itself a centered world, and the center in the world is the “you are here” indication. The center is always some entity that exists in the world and which the agent takes herself to be in that world, “where” she sees herself in that way things might be. Thus, a doxastic origin serves as the base centered world in a belief relation.

Summarizing:

- A **doxastic center** is an ordered pair consisting of a doxastic agent a and a time t : $\langle a,t\rangle$.
- A **doxastic origin** is an ordered pair of a doxastic center and a world: $\langle\langle a,t\rangle,w\rangle$.
- A **doxastic point of view** is a doxastic origin and its associated doxastic relation DOX.
- A **doxastic perspective** is the information accessible from a doxastic point of view, a ’s belief set at t in w : $\text{DOX}(\langle\langle a,t\rangle,w\rangle)$.

Roberts (2015) argues that the notion of a Doxastic Center so defined captures what Stalnaker (2014) calls “self-location in thought”. It will prove to be useful in interpretation even when *de se* attitudes are not obviously at issue, in modeling the CHARACTER of indexicals in a more flexible, yet constrained account.

In the classical examples of *de se* interpretation, the truth conditional distinction we saw in (5) is only apparent in attitude reports involving third person pronouns. But the problem also arises with indexicals. Consider whether you think the nurse in (6) speaks truly:

- (6) [spoken by the nurse in the context described in (5):] Ernie Banks believes the proposition he would express if he now said “I am one of the greatest shortstops of all time.”
- (7) [Bank’s counterfactual utterance:] I am one of the greatest shortstops of all time.

Under reasonable assumptions about the semantics of direct quotation, direct reference predicts (6) to be true. This is because the Kaplanian semantics for I makes it denote the actual speaker in the speech situation reported—here, the counterfactual situation where Banks utters (7). All the indexical does on that account is pick out the speaker and make that entity be the denotation *across all worlds*, including the counterfactual worlds reported by the nurse. So (7) in that situation would mean ‘Ernie Banks is one of the greatest shortstops of all time’, something that the amnesiac *does* believe. But in the situation in (5), the amnesiac Banks could not truthfully utter (7). Wechsler tells us why: (7) involves self-ascription, or self-location in the sense described above. To be truthful, (7) would have to mean that Banks regarded himself as one of the great shortstops.

Here is the technical explanation of the way this meaning arises in (6) on the Kaplanian account:

direct speech report **say_q**:

(modified from Potts 2007)

an utterance of the form **say_q**(α , “[_s ϕ]”) has two proffered implications:

- a speech act report: ‘the subject uttered the complement verbatim’
- an attitude report: ‘the subject sincerely proffered the meaning of what she uttered, as determined by its conventional content and the context c of the reported utterance’.

What is it to **sincerely proffer**?:

- S is declarative: proposes addition of the proposition denoted by ϕ in c to CG
- S is interrogative: poses the question denoted by ϕ in c for addition to QUD
- S is imperative: suggests the modal property denoted by ϕ in c , directed at the addressee, for addition to the relevant interlocutor’s ideals (goals for directive, wishes for desiderative, etc.)

Thus, e.g., sincerely proffering a declarative involves a commitment on the part of the speaker to the truth of the proposition denoted.

Spelling this out with the Kaplanian semantics for I :

- “[_s ϕ]” denotes the conventional lexical content of “[_s ϕ]”, a triple including its **phonological content**, **syntactic structure**, and **conventional semantic content**. E.g.:
 $“[_s (7)]” = \langle [a^y \text{ æm } \delta\text{ə } gre^y t\text{əs } f\text{ɜ}t\text{stap}] ; S ; \text{greatest-shortstop(I)} : t \rangle$
- **utter**($e, \alpha, “[_s ϕ]”) is true in a context c just in case e is an event of α uttering PHON(“[_s ϕ]”) at Time(c), in such a way (including prosody, gesture, etc.) as to convey SYN(“[_s ϕ]”) and SEM(“[_s ϕ]”).$
- **mean_{nn}**($e, \alpha, ||SEM([_s ϕ])|| ^{c}) is true in context c just in case e is an utterance (Grice 1957) by α at Time(c) in which α sincerely proffers to her interlocutors in c the semantic content of ϕ as interpreted in c . (See the attitude report associated with **say**, above, for all moods.)$
- **say_q**($\alpha, “[_s ϕ]”) is true in a context c just in case there is an event e occurring in context c' , s.t. Speaker(c') = α , UtteranceTime(c') = the EventTime of e , and
 $||\text{utter}(e, \alpha, “[_s ϕ]”)|| ^{c'} = 1 \& ||\text{mean}_{nn}(e, \alpha, ||SEM[_s ϕ]|| ^{c'})|| ^{c'} = 1$$

To determine the proposition Banks would express if he uttered (7) in counterfactual context c :

say_q(EB, “[_s *I am the greatest shortstop*]”) is true in context c iff there is an event e occurring in context c' , s.t. Speaker(c') = EB, Time(c') = ET(e), &

$$||\text{utter}(e, EB, “[_s *I am the greatest shortstop*]”)|| ^{c'} = 1 \&$$

$$||\text{mean}_{nn}(e, EB, ||\text{greatest-shortstop(I)}|| ^{c'})|| ^{c'} = 1$$

where (by (7')):

$$||\text{mean}_{nn}(e, EB, ||\text{greatest-shortstop(I)}|| ^{c'})|| ^{c'} = 1 \text{ iff } ||\text{greatest-shortstop}|| ^{c'} (EB)$$

- (7') where Speaker(c') = EB: $||\text{greatest-shortstop(I)}|| ^{c'} = ||\text{greatest-shortstop}|| ^{c'} (||I|| ^{c'}) = ||\text{greatest-shortstop}|| ^{c'} (Speaker(c')) = ||\text{greatest-shortstop}|| ^{c'} (EB)$
the proposition counterfactually expressed: ‘Ernie Banks is the greatest shortstop’

(6) asserts that Banks believes (7'). Even though (7') is interpreted in a counterfactual scenario, since the meaning of I in a direct quotation is determined by the reported context of utterance c' ,

its value will be ‘Ernie Banks’ in all possible worlds. Since we know from the scenario described that Banks *does* believe (7'), (6) is incorrectly predicted to be true.

What’s wrong?: Direct reference through Kaplanian Character fails to get at the *de se* character of indexicals. In uttering (7), Banks would self-locate as the great shortstop; and mere coreference does not suffice to capture this self-location.

4. Free Indirect Style and indexicals

As noted earlier, *I* and *you* are not the only indexicals. When we turn to others, we find that they do readily get shifted interpretations in a special type of context often called Free Indirect Discourse (FID), illustrated in (8):

- (8) 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.

Clearly the speaker in (8) intends *here* to refer to Tulsa and *now* to the time of John’s pondering—some time in the past, while *this house* refers to a house in John’s proximity. FID is sometimes described as a literary style, and it is used quite often by authors. But it is also quite common and unobjectionable in ordinary usage. Here is a first, informal description of the style (Eckardt 2014, Chapter 1):

Free indirect discourse is a way of reporting a person’s thoughts as if one could listen to their inner monologue. The effect is achieved by the use of perspective indicating elements in the sentences as if the sentence was uttered by a particular protagonist. . . . [It] is characterized by the fact that grammatical perspective of the sentence, and other types of perspectivising elements do not single out the same person as the speaker.

Besides several expressions typically taken to be indexical, like *here*, *now*, and *this* in (8), a great number of other expressions may be used in FID in such a way as to reflect the information, tastes, and judgment of the protagonist whose perspective is adopted, rather than that of the speaker. For example, in the following example cited by Eckardt, the evaluative adjective *wretched* as applied to the matter in hand, as well as the judgment that the situation was “the worst of all” reflect the protagonist Emma’s view of the matter in question, and not necessarily that of the author Austin:

- (9) The hair was curled, and the maid sent away, and Emma sat down to think and to be miserable.—It was a wretched business, indeed!—Such an overthrow of every thing she had been wishing for. —Such a development of every thing most unwelcome!—Such a blow for Harriet!—That was the worst of all.

(J. Austen, *Emma*. 1816[1994]. Penguin Classics, London. p. 103)

Uses in FID argue that *here* and *now* are not pure indexicals in Kaplan’s sense. To understand them, we must grasp the perspective intended by the speaker.

5. Shifting indexicals across languages

But matters are even worse for direct reference accounts of indexicality when we look across languages. Recall that Kaplan takes the unshiftable of indexicals to be a universal property of indexicals. He assumes that context is given once and for all at the outset of an utterance. Since the Content of an indexical is completely determined by the context, it shouldn't be something that can shift under the scope of operators that are part of proffered Content. He argued that there are no "Monsters" that shift context in such a way as to yield shifted indexical interpretations. But linguists have discovered that there *are* such critters as indexicals that shift in languages other than English.

In contrast to English *I*, the conventional content of 1st person singular pronouns famously works quite differently in some other languages. Consider Amharic (a Semitic language spoken in Ethiopia), as reported in Schlenker (2003). Amharic has a counterpart to *I* that varies in interpretation when embedded under a verb of saying (and not just in direct quotation), e.g. under an attitude predicate. It always refers to the speaker of *some* context, but that doesn't have to be the context of the actual speech act. Here is a schematic example (10), comparing the Amharic pronoun to English *I*:

- (10) Situation to be reported: John says: 'I am a hero'.
 a. *Amharic* (lit.): John_i says that I_i am a hero.
 b. *English*: John_i says that he_i is a hero/*John_i says that I_i am a hero.

In the Amharic (11), the 1st person embedded pronoun (apparently incorporated into the embedded verb, whose suffix *-ññ* is glossed as "1s", i.e. 1st person singular, highlighted below) is clearly evaluated with respect to the context of the reported rather than of the actual speech act, while in (12), the embedded object (highlighted) is 2nd person, again clearly intended to refer to the actual speaker *qua addressee in the reported speech act*:

- (11) *Situation reported*: John says: 'I am a hero' (D. Petros, p.c. to Schlenker)

j̃on j̃_gna n_-ññ y_l-all
John hero be.PF-ISO 3M.say-AUX.3M
 'John says that he is a hero'

- (12) m_n amt'-a nd-al-_-ññ al-s_mma-hu-mm
what bring.IMPER-2M COMP-say.PF-3M-ISO NEG-hear.PF-IS-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)

About these and other examples, Schlenker (2003:67-69) convincingly offers both syntactic and semantic arguments against taking the embedded clauses in such examples to be quoted. And he points out that "it is *only* in attitude reports that Amharic 1st and 2nd person pronouns can be shifted." Without an embedding attitude verb, shifting is not possible. Finally, shifting seems to be optional in Amharic, so that the suffix *-ññ* embedded under an attitude predicate can either be

anchored to the actual speaker or the reported agent. Hence, (11) can also be synonymous with the English *John says that I am a hero*.

There are a wide variety of other languages which permit similar indexical shift, with differing constraints on which indexicals can shift and under what conditions. For example, Anand & Nevins (2004) talk about two languages, Zazaki (an Indo-European language in the Iranian family, with data based on their own fieldwork with native speakers) and Slave (an Athabaskan language spoken in western Canada, with data reported by Rice 1986), which display extensive “shifting” of indexicals under certain verbs, wherein the understood antecedent of a 1st (or 2nd person pronoun or locative) is not the speaker (or the addressee or utterance location), but the agent subject of the verb (or the individual addressed by that agent or the location of the reported utterance). In Zazaki, this happens only under *vano* ‘say’, but with all the classic pure indexicals (‘I’, ‘you’, ‘today’, ‘now’, etc.). This arguably is not direct quotation, because the construction isn’t opaque with respect to various grammatical processes, like NPI licensing and A’ extraction (as in the Amharic (12) above), that typically cannot operate into direct quotations. In Slave, in some contexts 1st person indexicals (and only those) shift. The contexts are the complements of ‘say’ and ‘want’, where the shift is optional, and the complements of ‘tell’, where the shift is obligatory and applies to 2nd person, as well. No other indexicals ever shift in Slave. In these languages the indexicals also display what Anand & Nevins call “Shift Together” effects—if one shiftable indexical shifts, then all shiftable indexicals under the scope of the same predicate must shift, even across coordination.

The following table summarizes some of the aspects of shifting indexicals across languages, as drawn from the literature cited and discussed in more detail in Roberts (2015):³

³ For Amharic, see (2003); Japanese, Sudo (2012); Nez Perze, Deal (2013); Slave, Rice (1986) and Anand & Nevins (2004); Uyghur, Sudo (2012); Zazaki, Anand & Nevins (2004); Lléngua de Signes Catalana (LSC), Quer (2005, 2011, 2013). See also work on American Sign Language (ASL: Lillo-Martin 1995, Koulidobrova & Davidson 2014, Schlenker 2014), Deutsche Gebärdensprache (DGS: Hermann & Steinbach 2012; Hübl 2013), Langues des Signes Française (LSF: Schlenker 2014), and Lingua dei Segni Italiana (LSI: Zucchi 2004). Many other languages seem to have shifting indexicals (e.g., Tamil), but haven’t yet been reported in the relevant literature.

	shifting indexicals	predicates that license shifting	optionality of shifting	Shift Together
Amharic	1 st sg	V of saying	optional	N/A
Japanese	1 st , 2 nd	Vs of saying	optional	yes?
	1 st	Vs of thinking: 'consider'	optional	N/A
Nez Perze	1 st (s,pl), 2 nd	'say', 'think' (but no reported addressee with 'think', so 1 st only)	obligatory if loc shifts else optional	yes
	'here', 'from here'	'say', 'think'	optional; entails person shift	no
Slave	1 st , 2 nd	'tell'	obligatory	N/A
	1 st	intrans. 'say'/'think'/'want'	optional	N/A
Uyghur	1 st , 2 nd NOM, NOM-internal 1 st not ACC	Vs of saying: 'accuse, 'say'	obligatory when licensed	yes?
	1 st person NOM not ACC	Vs of thinking, hearing	obligatory when licensed	N/A
Zazaki	all	vano 'say'	optional?	yes
LSCatalan	1 st , 2 nd	RS-marked Vs of saying, attitudes	obligatory	?
	'this', 'tomorrow'		optional	no
	'here', 'now'	none	N/A	N/A

Table 1: Shifting languages: Partial inventory and summary of properties

Generalizations:

- all examples I've seen displaying shifted indexicals permit them in finite embedded clauses. (Sudo makes a point of this for Uyghur, which does not permit them in non-finite clauses.) I haven't seen reports of shifted indexicals in:
 - non-embedding attitude constructions (e.g. 'according to'—Sudo)
 - nominalized complements (Sudo rules these out for Japanese, but I haven't seen it elsewhere, either)
 - embedded questions, imperatives (e.g., per Sudo: in Japanese, not under the irrealis complementizer *yooni*, which combines with bouletics, predicates of commands)

Sudo points out that this restriction is not expected on a mixed quotation account of shifted indexicals (Maier to appear), since these kinds of contexts do readily permit mixed quotation.
- every language that displays shifting does so under Vs of saying (at least), and when it has other types of shifting verbs as well, shift under verbs of saying is more likely to be obligatory than under other attitude predicates
- with personal indexicals shifting is likely to be obligatory, whereas it's most often optional with locatives

- 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)
- 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). But I don't understand Deal's example (4) that supposedly shows that 'here' isn't *de se*: It could mean 'here in the picture', which is speaker-anchored, not shifted.
 - Sudo (2010:225) claims that 2nd person shifted pronouns in Uyghur needn't be *de te*.

Parameters of variation:

- **lexical variability in anchoring:** some indexicals permit only anchoring to actual context, others to shifted contexts, and then to only certain types of center:
 - Amharic 1st person: {©*, ©^{say}}
 - English *I* (as above): {©*}
 - English *now, here*: {©*, ©^{FID}}
 - LSCatalan: {©*, ©^{tell}, ©^{say}, ©^{think}, ©^{want}, .. .}
 - Nez Perze:
 - 1st person, locatives: {©*, ©^{say}, ©^{think}}
 - 2st person: {©*, ©^{say}}
 - Nez Perze locatives: {©*, ©^{say}, ©^{think}}
 - Slave:
 - 1st person: {©*, ©^{tell}, ©^{say}, ©^{think}, ©^{want}}
 - 2nd person: {©^{tell-@}}
 - Zazaki (all indexicals): {©*⁺, ©^{say}}
- **ranking of centers**, requiring anchoring to the highest ranked available center:
 - LSCatalan: 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 but pragmatically given; Shift Together
 - Slave: ©^{tell} > {©*, ©^{say}, ©^{think}, ©^{want}}, with further ordering contextually given; Shift Together
 - Zazaki: ©^{say} > ©*; Shift Together

See extended discussion in Roberts (2015).

There is one more important fact to note about the available cross-linguistic evidence about shifting indexical anchors. It seems that in all the spoken languages considered above—Amharic, Zazaki, Nez Perze, 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, Sudo 2012, Deal 2013). The literature on the signed languages doesn't always address this issue, but Schlenker (2014) does, and finds in his experimental work

on ASL that the shifted 1st person pronouns are obligatorily read *de se*, while 3rd person pronouns in indirect discourse are not.

None of these facts about the interpretation of 1st person singular pronouns and other indexicals across languages seems amenable to explanation on the direct reference approach.

6. Centers and discourse centers

6.1 Centered worlds and *de se* belief

As sketched already above, we know from the problem of *de se* belief (Lewis 1979b) that the doxastic state of an agent-in-a-world-at-a-time is not just a simple set of worlds. Doxastic propositional attitudes are not relations to propositions *simpliciter*, but must also reflect the agent's self-location in the worlds in question. Intuitively, the *relata* in a doxastic attitude are worlds labelled with a sort of you-are-here arrow: "and this is me, there, at that time"; technically, both the world in which the beliefs obtains and those reflecting what is believed are *centered* worlds, each a pair of a world and an individual (at a time) in that world. The individual-at-a-time is the center of a centered world. The agent whose doxastic perspective is reported is the center of the centered world in which the beliefs hold, and that centered world is the adopted point of view. Since some of the agent's beliefs are *de se*, i.e. about herself *qua self*, the center self-locates in each of her belief-worlds. So the doxastic perspective corresponding to a doxastic point of view is a set of centered worlds, the agent's belief state, the worlds being those in which all her beliefs are true and the center of each world in that state serving to characterize what the doxastic agent self-ascribes in that world.

believe denotes a complex relation which takes the proposition and the agent denoted by its subject and yields a relation between centered worlds. The base world is the pair of the agent (at the time of utterance) and the world of evaluation; the derived worlds are those in which the complement proposition is true *of the self-identified counterparts of the agent*. The ambiguity of interest then is captured by whether a pronoun in the complement clause that's coreferential with the subject has a denotation in the belief worlds which is the same as that of the derived centers, i.e. whether its denotation is taken by the base world's center to be his counterpart in the centered worlds in the belief set. This is the case in the 2nd of the logical forms for (5) given below, yielding the *de se* interpretation, but not in the first:

$$\begin{array}{l}
 [\text{Ernie Banks believes } \underline{\text{he}} \text{ is a great shortstop}]^w \\
 \text{believe}(\langle \text{eb}, w \rangle) \subseteq \{ \langle \text{©}, w' \rangle \mid \text{eb is a great shortstop in } w' \} \quad [\text{non } de \text{ se}] \\
 \text{believe}(\langle \text{eb}, w \rangle) \subseteq \{ \langle \text{©}, w' \rangle \mid \text{© is a great shortstop in } w' \} \quad [de \text{ se}]
 \end{array}$$

The *de se* interpretation, Banks self-locates as the great shortstop in all his belief-worlds; this is to say that he self-ascribes being the great shortstop.

The interpretation of an indexical conventionally depends on the doxastic point of view assumed

by the speaker at the time of utterance. This dependence is what I call (doxastic) *anchoring*; unlike the Kaplanian story, this dependence on the context of utterance does not imply coreference with any element in that context:

- Unless otherwise stated, the default doxastic point of view in any utterance is that of the speaker. This is fairly obvious intuitively, since it is propositions (purportedly) reflecting the speaker's view of the way the world is that are asserted, and, more generally, that form the background reflected in her presuppositions across all moods.⁴ We also see this, for example, in the fact that epistemic modals like *must* are by default anchored to the speaker (DeRose 1991), though that needn't always be the case (von Stechow & Gillies 2010; Roberts 2014).
- All the indexicals are by default intuitively anchored to the point of view of the speaker (or her addressee) in their utterance situation: Something is here because I am here; something takes place now because I am talking now. This is why *I am here now* is always true: It is first of **all a pragmatic, and not a semantic truth**, about what it is to do an embodied action. Similarly, the demonstrations canonically accompanying demonstratives can only be understood by imaginatively adopting the physical perspective of the pointing speaker.
- In Free Indirect Discourse (FID), the speaker adopts the point of view of a 3rd person agent. Then, in English, all the indexicals except for *I* and *you* are typically shifted to be anchored the point of view of the agent whose perspective is described.
- In languages in which the counterparts of *I*, *you* and other indexicals may be shifted under certain attitude predicates to be anchored to the agent of the attitude, typically these are predicates reporting the agent's claims about the way things are (verbs of saying, e.g.). This also introduces a new local center for the reported speech act, to which the indexicals can be anchored. Anchoring to a center always yields a *de se* interpretation, as desired.
- Wechsler's (2010) associativity of plural indexicals will follow from the fact that anchoring to the relevant center in discourse does not entail coreference with that center. I.e., the anchoring person feature is not the same as a referential index.

6.2 Discourse centers

A constrained theory of indexicals as perspectival expressions requires that we capture the way in which interlocutors in discourse track the doxastic agents available for anchoring doxastic points of view in a given context. We'll do this by slight expanding the kinds of information tracked in the context, assuming that this is realized in the kind of DRS considered in lecture 4. Here is full scoreboard I assume:

Context of utterance in a discourse D: $\langle DG_D, QUD_D, CS_D, DR_D, \textcircled{D}_D \rangle$, consisting of

DG: the interlocutors' evident goals, their Domain Goals

QUD: the set of questions currently under discussion

CS: the interlocutors' Context Set, the set of worlds compatible with their CG

DR: the set of Discourse Referents (DRefs), a set of variables of type $\langle s, e \rangle$

\textcircled{D} : the set of discourse centers, each the ordered pair of a DRef and a time: $\langle d, t \rangle$.

⁴ This is not to deny that it is the Common Ground (CG) which constrains what can be felicitously presupposed. Rather, first, if the speaker *s* is cooperative, then (ignoring times and centers) her doxastic state $DOX(s) \subseteq \cap CG$, and, second, when a presupposition requires accommodation, it is always taken to reflect the beliefs of the speaker.

For simplicity in this lecture we'll ignore the interlocutors' Domain Goals or the QUD. As for the CS, we can think of this as the set of worlds in which there are truthful embeddings of the corresponding DRS: those assignments of values to DRefs in its universe which are compatible with the DRS conditions. That is, as in Kadmon (2001), I assume that a DRS is richer than just a record of the conversation in progress, and includes all the information in the interlocutors' CG.

As is usual in dynamic theories of interpretation, a discourse referent (DRef) $d \in DR_D$ is a variable which serves as the address, or file label for information in the CG about some "entity" which is weakly familiar in the discourse. Because we track not only entities which we take to exist, but also hypothetical or arbitrary individuals under discussion (under the scope of a modal or other quantificational operator), DRefs cannot be reduced to actual individuals in a model. Instead, a DRef (file) acts as an address for tracking the information associated with what the interlocutors take to be a single (real or hypothetical) entity. The elements of DR, then, are correlated with individuals in the real world only if introduced in a *realis* context. Like free variables in static logical forms, elements of DR_D are interpreted by assigning them values in the model. The admissible assignment functions over DR_D are not arbitrary (as in the usual Montague grammar model), but are only acceptable insofar as they reflect the shared information associated with the DRefs, as reflected in the CS at the time of interpretation: Heim's File Cards, Kamp's truthful embeddings, and the related assignments in Martin's DyCG. In these notes, I'll treat DRefs as of type e , for simplicity; but in a fully adequate realization they need to be individual concepts of type $\langle s, e \rangle$ (see Roberts 2015 for discussion).

New to the scoreboard is a set of **discourse centers** \mathbb{C}_D , a dynamically changing indication of those familiar doxastic centers (agents at a time) whose doxastic perspective the interlocutors take to be relevant at that time in the discourse. A discourse center $\mathbb{C} \in \mathbb{C}_D$ is a pair $\langle d, t \rangle$ representing the agent d of a contextually relevant doxastic attitude at a given time t . Both elements of this pair are DRefs, since times—or events—are taken to be also familiar in the context, following Partee (1984). For simplicity here, we'll assume that times are comparable across worlds, so under any assignment of values to DRefs, t will denote a constant function. Thus, a discourse center is the conversational correlate of a center in Lewis' centered-worlds framework. To distinguish centers, they are doubly co-indexed to reflect both the agent and time; so $\mathbb{C}_{i,j} = \langle d_i, t_j \rangle$. Accordingly, if $j \neq k$, $\mathbb{C}_{i,j} \neq \mathbb{C}_{i,k}$, since the same agent may have different beliefs at different times.⁵

The set of **centers in a discourse D**, \mathbb{C}_D , is as follows:

$\mathbb{C}_D \subseteq \{ \langle d_i, t_j \rangle \mid d_i, t_j \in DR \ \& \ d_i \text{ is a doxastic agent whose beliefs at } t_j \text{ are under discussion in } D \}$. Given indices i, j, k, l, m for familiar DRefs $\in DR$:

- \mathbb{C}_D always includes a distinguished center $\mathbb{C}_{i,j}^*$, corresponding to the speaker(s) d_i at the time of utterance t_j , and another $\mathbb{C}_{k,j}^@$ corresponding to the addressee(s) at that time.

⁵ Whenever I don't think it will lead to confusion, I suppress the relativization to times in the interest of simplicity, and talk about a Center \mathbb{C}_i as a distinguished type of discourse referent d_i , corresponding to a contextually relevant doxastic agent.

- additional centers $\odot_{k,m}$ may be introduced in conjunction with the interlocutors' consideration of alternative doxastic states, triggered in a constrained fashion either by lexical semantics or in accordance with the conventions of discourse styles like FID. In particular:
 - dynamic compositional interpretation of an attitude predicate conventionally triggers the introduction of a discourse center corresponding to the agent of the attitude at the event time of the holding of the attitude; and
 - discourse conventions associated with FID trigger introduction of a center corresponding to the agent whose perspective at a given time is adopted by the author.

In addition, like other components of the language scoreboard, \odot_D is updated as the speaker changes, or when leaving the scope of a doxastic operator or FID.

The speaker-center \odot^* is updated whenever the speaker changes. Just as in Partee (1984), where in order to adequately model temporal semantics and pragmatics in discourse, the Reichenbachian Reference Time RT and the utterance time are updated dynamically over the course of interpretation, in this framework the distinguished center \odot^* at any given time is updated to be $\langle d,t \rangle$, d the familiar discourse referent corresponding to the speaker at that time, and t the time of utterance. The speaker is always the principal discourse center on the scoreboard—intuitively, the individual whose purported beliefs (presupposing the CG) are being reported in an assertion, whose identity serves as index for I , whose location serves as default location for *here*, etc., and whose perspective on the entities under discussion is the default assumed for the interpretation of NPs, at least in non-intensional contexts.

At certain junctures in utterance interpretation, the content and values of \odot_D changes, as the roles of the interlocutors change and other discourse centers become salient, relevant, and accessible. First, when the speaker changes, the value of \odot^* changes, and similarly with the addressee and $\odot^@$. In some cases additional centers are introduced as a function of the compositional update of the context in the course of interpretation of a single utterance: For example, following Heim (1992), use of *believe* introduces quantification over worlds in the doxastic state of the subject. Then under the scope of this predicate, that agent (at the relevant time and world of the reported belief) serves as a subordinate center, $\odot^{believe}$, whose life-span *qua* center is the scope of the operator itself. Generalizing, an attitude predicate or other expression whose meaning involves quantification over the worlds in a belief state (or, like *wish*, is founded on such a belief state), always subcategorizes for a corresponding doxastic agent; typically with an attitude predicate, this is the denotation of the predicate's subject (though see the object of *convince* in *Carol convinced Georgia to cut her hair*). Then under the scope of the attitude predicate R , there will be an accessible discourse center \odot^R corresponding to that doxastic agent. This is crucial for capturing *de se* interpretations and indexical shifting in languages like Amharic and Zazaki, and for addressing the *de re* interpretation of NPs in attitude complements, as I will illustrate below.

A pragmatic counterpart of this semantic mechanism serves to license shifted uses of English indexicals like *here* and *now* in FID. In FID, typically the author uses a variety of markers to indicate that this style has been adopted, and hence that the perspective has been shifted (see

Eckardt 2014); then a new $\textcircled{D}^{\text{FID}}$ is pragmatically introduced to the set of salient centers, the agent of $\textcircled{D}^{\text{FID}}$ corresponding to the literary character whose perspective is to be adopted.

The introduction of discourse centers is more restricted than the introduction of discourse referents themselves. The latter (I have argued) requires only weak familiarity. But update of the set \textcircled{D} occurs only (a) when the interlocutors' roles change, (b) when subordinate centers are introduced as part of conventional update/downdate, as when triggered by attitude predicates, or (c) as a reflection of FID. There are, arguably, other doxastic operators besides those in the lexical semantics of attitude predicates and in FID that may induce \textcircled{D} update. For example, English epistemic *must* is by default anchored to the speaker (e.g. see DeRose 1991) or, in interrogatives, the addressee; but under the scope of a perspectival adverbial like *according to John*, the anchor is shifted in (13), as it is in the complement of *thinks* with John as agent in (14). However, for introduction of a new center, it does not suffice that the most salient individual under discussion is a doxastic agent, even where that individual's doxastic state is explicitly mentioned, as we see in (15), where the speaker is still the understood anchor of *must*.

- (13) According to John, it must be raining.
- (14) I just asked John what he thought about the weather. He thinks it must be raining.
- (15) I just asked John what he thought about the weather. It must be raining.

Thus, even though the set of discourse centers may be a proper superset of the set of interlocutors, it is far more constrained than the set of weakly familiar anaphoric antecedents, any additions and changes given either by compositional semantics or conventions of use like those associated with FID.

Similarly, compare the indexicals to lexical items like *local*, *recent*, and *actual*, which are more flexible in their anchoring requirements. Consider Partee's (1989) *local* in (16):

- (16) After the game, every sports fan stopped at a local bar.
- (17) After the game, every sports fan stopped at a bar here for a drink.

In (16) the locale may be that of the speaker, the game, or the (widely dispersed) sports fans. This contrasts with the behavior of indexical *here* in (17), which can only be anchored to $\textcircled{*}$. See also Barlew (2013) for additional arguments that such locatives are not point-of-view sensitive, and Barlew (2015) for an analysis of *come* as anchored to doxastic point of view as well, hence with a more limited range of possible anchorings.

As in standard theories of dynamic interpretation, we need to guarantee a tight relationship between CS and DR, such that the interlocutors track the information they share about the elements of DR, and use that information to constrain the interpretation of anaphoric NPs. Again, in the interest of simplifying exposition, in what follows I will assume the notion of a **CS-consistent assignment g**; such a function assigns to discourse referents in DR values which are consistent with the interlocutors' information about them as reflected in CS. As in DRT or Heim's File Change Semantics, tracking information about familiar discourse referents is accomplished by putting constraints on assignments of values to variables. The index associated

with a discourse referent serves as its address, and as we add information about that discourse referent, this successively constrains the values which can be assigned to it in interpretation, requiring that all contextually felicitous assignments only give values which respect that information. Hence, if, say, a pronoun takes DRef d_i as its antecedent, the value assigned to the pronoun by a CS-consistent assignment g for a given world w , $g(d_i)(w)$, will be an entity which has all the properties the interlocutors take to hold of d_i in w . This information is updated throughout interpretation, dynamically; and the lifespan of d_i is restricted to the scope of any operators which have scope over the NP introducing d_i . Since all this information is in the interlocutors' context for interpretation at a given point in discourse, we say that the felicitous assignments are CS-consistent.

7. A perspectival CHARACTER for indexicals

The account I propose takes indexicals to be context dependent, but starts from the richer notion of context than that assumed by Kaplan, as we saw in §6, crucially including the set of discourse centers. At a given point in discourse, any of the elements of the set of discourse centers may potentially serve as doxastic anchors for indexicals, subject to constraints imposed by the lexical content of the indexicals themselves. For example, while English *I* can only be anchored by the distinguished center \textcircled{C}^* corresponding to the actual speaker, Amharic *I* may shift to be anchored by the center corresponding to the agent of certain embedding attitudes, e.g. $\textcircled{C}^{\text{tell}}$. English *here* may shift in FID to $\textcircled{C}^{\text{FID}}$, while *I* never does. Thus, shifting the doxastic perspective to someone other than the speaker(/addressee) is conventionally constrained by the combination of general constraints on center introduction and those on lexical anchoring for particular indexical expressions.

Then this is the essence of what it is to be indexical:

An indexical is an expression whose interpretation conventionally presupposes a relation to the doxastic point of view of a contextually available discourse center, its anchor.

The anchoring discourse center serves as Nunberg's (1993) *index*, while the lexically given relation presupposed is his *relational component*. Since the relation needn't be co-reference, indexical anchoring is not generally coreference.

Each indexical's conventional content—its Character—has two parts, its felicity condition (reflecting any presuppositions or other conditions on felicitous use) and its proffered content (assuming that those conditions are met). The proposed semantics for *I* at first sight resembles Kaplan's in that it is lexically anchored to the contextually understood speaker. I have simplified the semantics here in several respects for ease of presentation; see Roberts (2015) for more details and modifications that permit the CHARACTER to yield the right results across more complex cases involving so-called “fake indexicals” (Kratzer 2009):

CHARACTER of English I : [simplified]

Given a context $K = \langle CS_K, DR_K, \odot_K \rangle$, with \odot^* a distinguished element of \odot_K :

Presupposed content: Use of I_i is felicitous in K at time t just in case $\odot^* = \langle d_i, t \rangle$.

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

The presuppositional content of I_i is a requirement that the corresponding DRef serves as the agent of \odot^* (thereby also requiring that it be a familiar entity in the discourse). The proffered content then just identifies the sense of I_i with 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 \odot^* , 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.

The proposed semantics for I guarantees that it will always be understood *de se* in the context of utterance. Since the speaker is one of the interlocutors and is self-aware as such, and \odot^* is itself a reflection of the interlocutors' CG, the speaker (unless unconscious and rambling) is always self-located *qua* speaker.

The same \odot^* anchoring makes *we* be *de se* as well, under the following interpretation:

CHARACTER of English we : [simplified]

Given a context $K = \langle CS_K, DR_K, \odot_K \rangle$, with $\odot^* = \langle d_k, t \rangle$ a distinguished element of \odot_K :

Presupposed content: Use of we_i is felicitous in K at time t just in case $\odot^* = \langle d_k, t \rangle$ and there is a $d_i \in DR_K$ s.t. for all CS-consistent assignments g , $g(d_k) \leq g(d_i)$.

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

Like I , we is always presuppositionally anchored to the agent of \odot^* , the DRef d_k . But unlike I , it needn't be coreferential with \odot^* 's agent. Instead, it must refer to some familiar entity that includes that agent, $g(d_k) \leq g(d_i)$; typically the denotation properly includes the center. This is the associative semantics noted by Wechsler. If \odot^* itself has a plural agent, it may be that $d_k = d_i$. But if the agent is a singular speaker, then we may be understood to refer to an inclusive group including the addressee \odot^\oplus , or an exclusive group including some salient individual(s) other than the addressee (the difference grammaticized as inclusive vs. exclusive 2nd person plural in some languages). Consider (18):

(18) Whenever I_7 play duets with someone₁₁, we_{12} always play Fauré.

Assume \odot^* has the singular agent d_7 , and $d_{12} = d_7 \oplus d_{11}$,⁶ where d_{11} is the DRef for the narrow scope indefinite *someone*₁₁; in that case, *we* is both indexical—anchored to \odot^* , and bound to an arbitrary value for d_{11} .

The 2nd person pronoun *you* has a similar semantics to that of *we*.⁷ The differences are that, of course, it is anchored to the addressee(s) instead of to the speaker(s), and, crucially, that it needn't take a syntactically plural antecedent:

CHARACTER of English *you*: [simplified]
 Given a context $K = \langle CS_K, DR_K, \odot_K \rangle$, with $\odot^{\textcircled{a}}$ a distinguished element of \odot_K :
Presupposed content: Use of you_i is felicitous in K at time t just in case $\odot^{\textcircled{a}} = \langle d_k, t \rangle$ and there is a $d_i \in DR_K$ s.t. for all CS-consistent assignments g , $g(d_k) \leq g(d_i)$.
Proffered content: Where defined, for all CS-consistent assignments g : $|you_i|^{K,g} = g(d_i)$.

If $g(d_k) = g(d_j)$, the interpretation of *you* is singular. If not, it has a group-addressee interpretation. In the latter case, Wechsler's associative plural generalization still holds: As with *we*, *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.

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 \odot^* , *here* to the location of the agent of \odot^* 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, $\text{DOX}(\odot)$, where $\odot \neq \odot^*$; for example, the anchor might be \odot^{FID} .⁸

So long as anchoring to \odot^* (or $\odot^{\textcircled{a}}$) is presupposed, then the resolution of the anchoring presupposition leads to projection. When the anchor instead is the agent of an alternative perspective, a doxastic state other than the CS, as in Amharic examples embedded under appropriate attitudes (§1.3, discussed in §5 below), then the illusion of direct reference is broken.⁹ The trigger introducing the relevant alternative belief state, say an attitude predicate, is not a monster shifting the global context. It is just that in introducing that state it also introduces a new, subordinate center which can serve as an alternative anchor to \odot^* for the more flexible indexicals or \emptyset . The presupposition of a doxastic anchor is satisfied locally, and there is thus no

⁶ The join operator \oplus is borrowed from Link's (1979).

⁷ The semantics offered for *you* and discussion of its *de te* properties were prompted by a very stimulating correspondence with Steve Wechsler (p.c.), who pressed me to consider how it might differ from *I/we*. However, he may well not agree with my conclusions here.

⁸ 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.

⁹ See Roberts (2014) for discussion of the application and implications of this account for English epistemic modals.

projection to anchor to the time or place of utterance. As we saw in Table 1 above, even in these languages, individual indexicals vary in their shiftability, which may be captured by constraints on what kinds of discourse centers can satisfy their anchoring presupposition.

Here is a sample CHARACTER for Amharic $\tilde{n}\tilde{n}$, illustrating how lexical constraints on anchoring can be imposed by the associated presupposition:

CHARACTER of Amharic 1st person singular $\tilde{n}\tilde{n}$: [simplified]
 Given a context $K = \langle CS_K, DR_K, \odot_K \rangle$:
Presupposed content: Use of $\tilde{n}\tilde{n}_i$ is felicitous in K at time t just in case there is a $\odot = \langle d_i, t \rangle$ s.t. $\odot \in \odot_K$ and \odot is a member of the set $\{\odot^*, \odot^{\text{tell}}, \odot^{\text{say}}\}$.
Proffered content: Where felicitous, for all CS-consistent assignments g , $|\tilde{n}\tilde{n}_i|^{K,g} = g(d_i)$.

As discussed in Roberts (2015), Shift Together in languages like Slave can be captured by preference orders over the available centers, with the presupposition of the indexical requiring the highest ordered center in the acceptable set.

Note that since subordinate anchors like \odot^{tell} are only introduced in the complements of attitude predicates, in such cases when the anchor of $\tilde{n}\tilde{n}$ is “shifted” to \odot^{tell} the context which permits this resolution is an essentially local context, as opposed to the required global satisfaction of the anchor for I . But it is not so much that context has been *shifted* as that it has been enriched so that local context \neq global context. Nonetheless, so long as the agent of ‘tell’ is itself globally familiar, the presupposition will “project”. But like anaphoric presuppositions generally, indexical presuppositions have no local effect.

Hence, the apparent scope of an indexical is always a function of the resolution of its doxastic anchor. I borrow a term from Kratzer (1998)¹⁰ and call the apparent wide scope of indexicals when they occur embedded under attitudes and other operators (including negation, etc.) **pseudo-scope**, which I take to be the mere *appearance* of wide scope induced by presupposition satisfaction. The effect is no different from the apparent wide scope of the definite description in a conditional displayed in the following contrast:

- (19) If you park a car on a steep hill, engage the emergency brake.
- (20) The gears on this car tend to slip. If you park on a hill, engage the emergency brake.

In both (19) and (20) the definite description *the emergency brake* is understood functionally as ‘the emergency brake of x ’, presupposing an appropriate vehicle as bridge. In (19) that antecedent is the (denotation of the) indefinite *a car* in the conditional protasis; then because the antecedent is non-specific, the presupposition resolved under the scope of the conditional, the target definite is also understood to take narrow scope, be non-specific. But in (20), the presupposition is resolved via the salient *this car* (presumably used demonstratively), which has global scope, denoting a specific car; then the emergency brake is understood to be that of the demonstrated car. This has the effect of giving the definite wider scope than the conditional, but

¹⁰ though she might not agree with the sense I would give it here.

in fact we don't need scope to achieve this effect. This is *pseudo-scope*. If an indexical's perspectival presupposition is always satisfied by anchoring to a globally available ©, it always projects, yielding the same effect as wide scope.

See Roberts (2015) for discussion of demonstratives.

8. A neo-localist pragmatics for indexicality

The account of indexicality offered above differs in two significant respects from the classical account in Kaplan (1977):

- The CHARACTER of an indexical carries an anaphoric presupposition.
- What is presupposed is a *de se* anchor, yielding a self-locating, or self-ascriptive sense for the indexical.

Are there Kaplanian Monsters? No and yes. No: We don't need special context-shifters to give an empirically satisfying account of indexicals. But yes: When we understand indexicals as presuppositions, we automatically expect that under the right conditions their presuppositions might be satisfied by a merely local context, as opposed to the global context of utterance. It isn't that the context is "shifted", by a Monstrous context-shifter; rather, context is **updated in an on-going way in the course of interpretation**, as independently motivated by the patterns of presupposition projection we first saw captured by Karttunen's projection schemata in lecture 3. This is nothing special for indexicals. What is special about them is that many indexicals in many languages (like English *I*) are only satisfiable in the global context. And even when they may be anchored by an agent introduced in an embedding context, as in Amharic, they display a strong tendency to specificity, resisting a bound variable interpretation; see Roberts (2015) for discussion.

The sketch in the previous section only skims the surface of the rich subject of pronominal indexicals, for which you are referred to my recent ms. for more detailed discussion. I hope that the discussion gives a sense for how the approach based on presupposed anchoring to doxastic centers (via their discourse referent stand-ins in the context of utterance) addresses the problems for the direct reference account that were discussed earlier. Wechsler's insight is modeled by differentiating the anchoring center *determined by the person of the indexical pronoun* from the referential index on the pronoun. In the plural indexicals the anchoring center need only be a member of the anaphorically presupposed DRef antecedent, and associativity follows. This captures Wechsler's claim that the function of 1st and 2nd person is to indicate the self-attributing agent. Self-attribution follows from the fact that the anchors are centers, in a sense independently motivated for *de se* interpretation in belief contexts generally, even with 3rd person. As a bonus, anchoring to centers entails the *de se* character of shifted indexicals attested cross-linguistically. But with all this, the attested wide-scope of English indexicals (and those in most languages) follows from the pseudo-scope resulting from anchoring to a globally familiar agent, the actual speaker (©*) or a shifted reported speaker (e.g., ©^{tell}).

But the indexicals include a much broader class of triggers than just the pronominal indexicals and Kaplan's "impure" locative and temporal adverbials. In fact, it covers the broad class of

phenomena considered by Fillmore (1975) in his famous “Lectures on Deixis”, by Mitchell (1986) in his discussion of the broad role of the semantics of point of view, and by Speas & Tenny (2003) in their discussion of the role of point of view in grammars cross-linguistically, among many others. Call the expressions in this broader class the **perspectival expressions**. Here are a few of the types of perspectival expressions the above account is intended to address:

- perspectival locatives like *to the left* and *above*, among many others. See Barlew (2013, 2015 in press), and his arguments that not all locatives are perspectival: e.g., *local* is not, as we saw above.
- deictic motion predicates like *come*. See Fillmore (1975), Barlew (2015)
- tenses like those in English.
- epistemic modal auxiliaries like *must* and *might*; and certain evidentials across languages (Kierstead, to appear)
- appositives like Potts’ (2005) nominal appositives and non-restrictive relative clauses; see Amaral, Roberts & Smith (2008) for arguments that these are perspectival, Harris & Potts (2009) for experimental evidence in favor of that hypothesis. We’ll talk about these in lecture 6.

Roberts (2015) argues that *de re* interpretation is also perspectival, using tools from Aloni (2001) to capture how this works. But this type of shift in perspective is pragmatic, not driven by conventional shifts, though it is constrained by the same kind of discourse centers.

Summarizing then:

An **indexical** is an expression whose interpretation conventionally presupposes a relation to the doxastic point of view of a contextually available discourse center, its anchor.

As the list above suggests, then, an indexical may be of any type. But unlike the Kaplanian Character account of what it is to be an indexical, this definition rules out non-demonstrative uses of pronouns (including especially *it*, which never has a demonstrative use; see Maclaran (1982), expressions like *local*, non-epistemic (“circumstantial”) modal auxiliaries, and many other context-dependent expressions *which do not presuppose an anchoring discourse center*.

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