Indexicality and *De Se* Reports[*]

P. Schlenker

To appear in the *Handbook of Semantics* edited by von Heusinger, Maienborn and Portner, Mouton de Gruyter.

December 29, 2009

Indexicals are context-dependent expressions such as *I*, *you*, *here* and *now*, whose semantic value is determined by the context in which they are uttered (e.g. *I* denotes John if uttered by John, and Mary if uttered by Mary). In English, these expressions typically depend on the *actual context of speech*, i.e. the context in which they are in fact uttered. In other languages, however, some indexicals may depend on the context of a *reported* speech act, so that what is literally *John says that I am a hero* may mean that John says that he, John, is a hero; in such cases, we say that the indexical is 'shifted' because it is evaluated with respect to a context that is different from the context of the actual utterance. In yet other languages, there are dedicated expressions for this reported use, with a pronoun *he** that can *only* appear in indirect discourse; these 'logophoric expressions' can, at least as a first approximation, be analyzed as indexicals that are obligatorily shifted. This chapter provides an overview of the semantics of indexical and logophoric expressions, with special reference to recent theoretical and cross-linguistic analyses.

1. Kaplan's Theory of Indexicality

The modern theory of indexicality owes much to philosophers of language, who were interested in the foundations of semantics, and more specifically in the general form of the procedure by which sentences are interpreted. The standard theory, due to David Kaplan, has three main tenets (Kaplan 1977/1989, 1978).

(i) The interpretation function, henceforth written as $[\![\, . \,]\!]$, must be relativized to a context parameter *in addition* to the other parameters (e.g. time, world, assignment function) which are independently necessary for the analysis of non-indexical expressions.

(ii) Contexts are ontologically distinct from other parameters; in particular, they are strictly more fine-grained than individuals, times or possible worlds. In fact, it is often helpful to think of a context c as a triple of the form $<c_a, c_t, c_w>$, where c_a, c_t and c_w are respectively the agent (also called 'speaker' or 'author'), the time and the world of c (for some applications it is useful to add a hearer coordinate c_h or a location coordinate c_l).

(iii) Unlike other parameters, which can typically be 'manipulated' by various operators, the context parameter remains fixed throughout the evaluation of a sentence. Purported operators that violate this condition are called 'monsters', and are claimed by Kaplan not to exist in natural language (though they can easily be defined in a formal language).

(i) is generally accepted. But (ii) and (iii) need not be.

Let us first consider (ii). Some authors (e.g. Stalnaker 1981, 1999, Stechow & Zimmermann 2005) have attempted to develop theories of indexicality in which contexts are ontologically on a par with some other parameter - in Stalnaker's case, the world parameter. A similar decision may also appear natural if one adopts an event- or situation-semantics, since the speech act is certainly an event or a situation of a particular sort. When such a move

[*] Thanks to Pranav Anand for allowing me to copy-and-paste some examples from his dissertation, and to Ora Matushansky and , Chris Potts and Anna Szabolcsi for discussion of some examples. Special thanks to Paul Portner for providing detailed comments on this article.

is made, any discussion of context dependency must provide an *independent* criterion for determining which parameter 'counts' as the context, on pain of causing endless terminological confusion.

This, in turn, has consequences for (iii): if there is no ontological difference between the context and other parameters, one may be tempted to *define* the context to be that parameter (if there is one) which cannot be manipulated by any operator. This move turns (iii) into a truth by definition (see for instance Lewis 1980 and Zimmermann 1991 for such a view). By contrast, Kaplan took (iii) to be a substantive empirical claim. Any definitional move is of course admissible, but only confusion will result if various definitions are mixed without proper warning. In the rest of this paper, we adopt (i) and (ii) (taking contexts to be ontologically distinct from times and worlds), and we submit (iii) to closer empirical and formal scrutiny.

Kaplan's "prohibition against monsters" was primarily motivated by a philosophical thesis, according to which *indexicals are directly referential*. This view should be understood by opposition to the Fregean view of meaning, which encompasses two claims: (a) all linguistic expressions - including indexicals - refer to objects *indirectly*, by virtue of a 'sense' (= *Sinn*), and (b) an expression found in indirect discourse does not refer to its standard denotation (= *Bedeutung*) but rather to its sense (= *Sinn*). If (b) held of all expressions, including indexicals, one would expect that in indirect discourse these may fail to have their usual denotation - so that *John said that I am stupid* might attribute to John a claim about John himself rather than about me, the speaker. In Kaplan's technical framework, this would mean that attitude verbs are 'monsters', which he denied on the basis of English data. He thus took his thesis of direct reference to have not just conceptual but also empirical motivation. As we will see, the latter can be challenged. We start by reconstructing Kaplan's formal analysis, leaving aside the philosophical issue of direct reference; we then subject it to closer empirical scrutiny (see Zimmermann 1991 for a more thorough survey of Kaplanian semantics).

1.1 Context vs. Index

We begin with an informal characterization of a *context* as a speech situation, which should minimally specify who is talking, at what time and in what possible world; in many cases we will also need to specify who the addressee is. Contexts may be taken to be primitive, in which case one must define various functions that return the agent [= speaker], hearer [= addressee], location, time and world of a context c, henceforth written as c_a, c_h, c_l, c_t and c_w. Alternatively, contexts may be identified with tuples of the form <speaker, (addressee), time of utterance, world of utterance, etc>. The speaker, addressee, time and world of the context are sometimes called its 'coordinates'.

1.1.1 Contexts and other parameters

Why couldn't we treat indexical expressions as constants - which would endow them with the behavior of, say, proper names as standardly analyzed? First, the value of indexicals is far less stable than that of proper names: the speaker and addressee normally use a proper name to refer to the same individual, but this is certainly not the case of the expression *I*. Second, analyzing indexicals as constants would miss something important about the *cognitive* role they play. Kaplan was especially interested in two types of cases: sentences which are in some sense *a priori* true, although one would not want to say that they are necessarily true; and examples in which the cognitive significance of a statement does not just encompass

information about the world, but also about where in the world the speaker is - or in other words, in which context the speaker is located.

Consider the sentences in (1):

(1) a. I am here now.
b. I exist.

Without knowing anything about the world, we can determine that these sentences must be true; they are in that sense *a priori* true. Yet they do not have the form of logical tautologies; the presence of indexicals is crucial to obtain this kind of *a priori* truth, as can be seen if we replace *I*, *here* and *now* in (1) with *John*, *New York*, and *Wednesday, April 9, 2008* respectively (the resulting statement cannot be determined to be true unless one knows something about the world).

The opposite situation also occurs: one may know everything there is to know about the world, and yet fail to know the value of a sentence containing indexicals. This may happen if the speaker knows in which world he is, but not in which context he is - in other words, he does not know *where* in the world he is located (note that this situation is formally conceivable since contexts are strictly more fine-grained than possible worlds). An example is provided by John Perry and further elaborated by David Lewis:

> An amnesiac, Rudolf Lingens, is lost in the Stanford library. He reads a number of things in the library, including a biography of himself, and a detailed account of the library in which he is lost... He still won't know who he is, and where he is, no matter how much knowledge he piles up, until that moment when he is ready to say, "*This* place is aisle five, floor six, of Main Library, Stanford. *I* am Rudolf Lingens." (Perry 1993; 21)

Lewis comments:

> It seems that the Stanford library has plenty of books, but no helpful little maps with a dot marked "location of this map." Book learning will help Lingens locate himself in logical space. (...) But none of this, by itself, can guarantee that he knows where in the world he is. He needs to locate himself not only in logical space but also in ordinary space. (Lewis 1983; 138)

In Perry's scenario, Lingens is certainly in a position to say *Lingens is <at time t> in the Stanford Library*, but not *I am <at time t / now> in the Stanford Library*. The first person pronoun is in this case an 'essential indexical' because it cannot be replaced with any non-indexical expression if its cognitive content is to be preserved.

The first observation suggests that an adequate characterization of *a priori* knowledge should be given in terms of *truth in all conceivable contexts* (we come back to the term 'conceivable' below):

(2) A sentence *S* is a priori true if and only if for each conceivable context c, S is true in c.

The second observation suggests than an adequate characterization of belief (the psychological attitude, not the semantic relation denoted by the verb *believe*) should involve contexts as well. Taking a hint from the tradition of epistemic logic, we can say that an agent - say Lingens - believes a sentence *S* just in case for each context c *compatible with Lingens's belief*, *S* is true in c.

At this point, it may be tempting to try to do everything with a single parameter, the context parameter. This won't work, however. Following the tradition of modal logic, we may analyze the semantics of *necessarily* in terms of a modal parameter p:

(3) $[\![\text{necessarily F}]\!]^{p}$ = true if and only if for every p' [which stands in a pre-determined relation to p][1], $[\![\text{F}]\!]^{p'}$ = true.

Now let us suppose that the parameter *p* is just the context parameter. We just saw that *I exist* is *a priori* true. This means that for every conceivable context c', $[\![\text{I exist}]\!]^{c'}$ = true. But then it follows that the sentence *I necessarily exist* is true as well! Similarly for: *I couldn't fail to exist*, and any number of more felicitous paraphrases of the philosopher's semi-technical jargon. Necessary existence is, at best, a property of God, but certainly not one that any ordinary speaker enjoys; the analysis has gone awry.

The error, Kaplan suggests, is to take modal operators such as *necessarily* to manipulate the context parameter. If we introduce a distinction between a world parameter and a (strictly more finely individuated) context parameter, we will be able to have our cake and eat it too on condition *I* is evaluated with respect to the context parameter, while *exist* is evaluated with respect to the world parameter:

(4) a. $[\![\text{I}]\!]^{c, w} = c_a$
b. $[\![\text{exist}]\!]^{c, w}(d)$ = true if and only if d exists in w.

Before we come to the derivation of the desired truth conditions, we must make two further assumptions.

Assumption 1. In accordance with the intuitive characterization we provided above, contexts should be *possible* speech situations (or for some applications: possible speech *or thought* situations). As a result, the coordinates of a context must satisfy certain constraints of coherence, in particular those in (5):

(5) For any context c, the agent of c exists at the world of c; more generally, the agent of c is at the location of c at the time of c and in the world of c.

Assumption 2. When we evaluate a root sentence *F* pronounced in a context *c*, we assess its truth value by taking the context parameter to be c *and the world parameter to be the world of c*.

Our earlier observations can now be made compatible (we abbreviate 'if and only if' by 'iff').

(i) *I exist* is *a priori* true because in any context c, $[\![\text{I exist}]\!]^{c, c_w} = [\![\text{exist}]\!]^{c, c_w}([\![\text{I}]\!]^{c, c_w}) = [\![\text{exist}]\!]^{c, c_w}(c_a)$ = true iff c_a exists at c_w. But by (5), the latter condition is always satisfied.

(ii) Still, *I necessarily exist* need not be true: $[\![\text{necessarily I exist}]\!]^{c, c_w}$ = true iff for every w' [which stands in a pre-determined relation to c_w], $[\![\text{I exist}]\!]^{c, w'}$ = true
iff for every w' [which stands in a pre-determined relation to c_w], $[\![\text{exist}]\!]^{c, w'}(c_a)$ = true,
iff for every w' [which stands in a pre-determined relation to c_w], c_a exists in w'.
But of course w' need not be the world of c - and hence we correctly predict that the sentence need not be true.

Once this simplified framework is in place, we can add further parameters - in particular a time parameter t, and an assignment function s, which will provide a value for

[1] The bracketed part is left indeterminate; in the terms of modal logic, it is an 'accessibility relation' which allows the adverb *necessarily* to have the effect of a *restricted* universal quantification.

individual variables. We can then treat more complex examples by positing appropriate lexical rules; for instance, *now* can be analyzed as an indexical operator, which 'replaces' the time of evaluation *t* with the time coordinate of the context, c_t:

(6) $[\![\text{now F}]\!]^{c, t, w} = [\![\text{F}]\!]^{c, c_t, w}$

In the tradition of modal logic, past and future tenses can be treated as existential temporal operators, which quantify over moments that precede or follow the time of evaluation. One usually makes the further assumption that the present tense is either morphologically absent or that it remains uninterpreted, so that it leaves the time parameter unmodified.

(7) a. $[\![\text{PAST F}]\!]^{c, t, w}$ = true iff for some t' < t, $[\![\text{F}]\!]^{c, t', w}$ = true
b. $[\![\text{FUT F}]\!]^{c, t, w}$ = true iff for some t' > t, $[\![\text{F}]\!]^{c, t', w}$ = true

(Further operators could be defined along similar lines - for instance *some day* or *everyday* could be treated as operators that quantify over days, following the model of (7)).

Normally, a tense operator shifts the time of evaluation of every expression that appears in its scope. However, thanks to the *now* operator, the time parameter may be shifted back to the time of the context of utterance. Thus in (8), analyzed for simplicity as (8), the *now* operator makes it possible for the definite description to denote the person who is the president *at the time of utterance* (in the derivation of the truth conditions, we assume that at all times there is exactly one president):

(8) a. John will mourn the person who is now president.
a'. FUT John mourn the now president
b. $[\![\text{(a')}]\!]^{c, t, w}$ = true iff for some t' > t, $[\![\text{John mourn the now president}]\!]^{c, t', w}$ = true,
iff for some t' > t, John mourns at t' in w $[\![\text{the now president}]\!]^{c, t', w}$,
iff for some t' > t, John mourns at t' in w the one and only person d such that $[\![\text{now president}]\!]^{c, t', w}$(d) = true,
iff for some t' > t, John mourns at t' in w the one and only person d such that $[\![\text{president}]\!]^{c, c_t, w}$(d) = true,
iff for some t' > t, John mourns at t' in w the one and only person d that is president *at* c_t in w.

In this case, the same reading could be obtained by moving the definite description out of the scope of the tense operator (with the Logical Form: *[the president]* λx *FUT John mourn x*). But in other cases, as in (9), this operation is syntactically implausible, or it does not suffice to yield the desired results, or both.

(9) Some day, it will be the case that every person now studying with John will be on the editorial board of *Linguistic Inquiry*.

It can be checked that *it will be the case that* is a scope island, and furthermore that the truth conditions of the sentence require that the quantifier *every person now studying with John* be in the scope of the existential time operator *some day*. Still, it is essential that *now studying* be evaluated with respect to the time of utterance. The semantics we have given for the *now* operator (similar to Kamp 1971) makes this easy to achieve.

Entirely parallel arguments can be made in the world domain with respect to an analogous 'actually' operator, whose semantics is defined as follows:

(10) $[\![\text{actually F}]\!]^{c, t, w} = [\![\text{F}]\!]^{c, t, c_w}$

All the readings available in the temporal case can be replicated in the modal case. There is one peculiarity, however: contrary to what is often assumed, the word *actually* does not

display the behavior of a *bona fide* indexical - when embedded under other modal quantifiers it gives rise to many more ambiguities than a world indexical would (Cresswell 1990) (the apparent absence of world indexicals does not follow from the present framework).

Let us make two further remarks for future reference; they apply to temporal and modal talk alike, but for simplicity we restrict attention to the temporal case.

(i) When the word *now* is dropped from (9), we obtain an ambiguous sentence: *person who is studying with John* can be understood either as *person studying with John at the future time* under consideration, or *person studying with John at the present time*. The first reading is predicted by our modal analysis (since the present tense has no semantics), but the second is not. Here it appears that we have more readings than the modal analysis predicts; in fact, the present tense displays in this case the behavior of a variable, which may be bound (by *some day*) or left free - which gives rise to distinct readings.

(ii) When (9) is embedded under further operators, more complicated readings are obtained if *now* is replaced with *then* - or is just omitted. Thus in (11) *then* is dependent on *each year*, even though the quantifier *all of the students then studying with him* is in the scope of the time operator *some day*.

(11) Each year, it was clear to John that, some day, all of the students <then> studying with him would be on the Editorial Board of *Linguistic Inquiry*.

The *now* operator won't help us in this case, because *then* doesn't refer to the time of utterance, but rather displays the behavior of a variable bound by the time quantifier *each year*.

The difficulties in (i) and (ii) (as well as their counterparts in the world domain) have often been taken to suggest that temporal and modal talk might in the end involve resources that are as rich as object talk - and in particular that despite initial appearances there are temporal and pronouns, as well as quantifiers (see Cresswell 1990 for a detailed discussion of these problems)[2]. This point will matter in Section 3.2.1 when we discuss the precise nature of monsters (should they be 'modal' or 'quantificational'?).

1.1.2 Character vs. Content

The interpretation function as we have analyzed it is characterized by the simultaneous presence of several parameters, which are manipulated by different expressions. In the literature, one often presents things as if the interpretation function took its context and its world arguments in a particular order. The idea is that an expression is first evaluated with respect to a context, which yields the *semantic content* of that expression. One then feeds a world of evaluation to this content to obtain the value of the expression. In this *façon de parler*, the meaning of an expression, called by Kaplan a 'character', is a function from contexts to contents; and a content is just a function from worlds (or world-time pairs) to objects (which may be truth values).

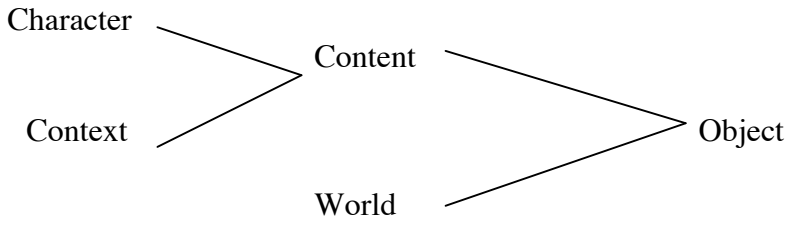
---

[2] Specifically, we may treat tenses as time variables which, like pronouns, may receive a deictic reference or be bound by quantifiers (see Partee 1973 for seminal work on this approach). In such a framework, (9) (without *now*) and (11) may be analyzed as (i) and (ii) respectively, where it has been assumed that Noun Phrases and Verb Phrases alike take a time argument in their highest position (normal time variables are written i_k for some index k, and a designated variable that denotes the speech time is written as i^*):

(i) $[\exists i_1: i_0 < i_1]$ [every $[i_0$ student]] λx $[i_1$ [x be-on-the-EB]]

(ii) $[\forall i_0: i_0 < i^*]$ ... $[\exists i_1: i_0 < i_1]$ [every $[i_0$ student]] λx $[i_1$ [x be-on-the-EB]]

(12) Character and Content



In this picture, what provides the cognitive significance of an expression is, as a first approximation, its *character*: it is because 'Lingens is at Stanford' and 'I am at Stanford' have different characters that Lingens can believe the former (because he has complete knowledge of the world he is in) without thereby believing the latter (because he does not know in which context he is located). By contrast, what provides the closest Kaplanian equivalent of Frege's notion of sense is the *content* of the sentence. The prohibition against monsters entails that modal operators may only be sensitive to the content of an expression, not to its full character (more precisely: any operator *Op* that is not monstrous guarantees that if *F* and *F'* have the same content but possibly different characters in a context c, *Op F* and *Op F'* have the same value when evaluated in c). To take an example, on the assumption that the proper name *Lingens* is rigid and thus denotes the same individual in all possible worlds, the character of the sentence S = *I am Lingens* can be characterized as follows (for simplicity, we leave out time dependency):

(13) Character(S) = $\lambda c\, \lambda w\, [c_a = \text{Lingens}]$

Similarly, the character of S' = *I am here* is the following:

(14) Character(S') = $\lambda c\, \lambda w\, [c_a \text{ is at } c_l \text{ in } w]$

On the assumption that c* is a context whose agent is Lingens and that he is at Stanford, the content of S and S' is:

(15) Content(S) = Character(S)(c*) = $[\lambda c\, \lambda w\, c_a = \text{Lingens}](c^*) = \lambda w\, [\text{Lingens} = \text{Lingens}]$.

(16) Content(S') = Character(S')(c*) = $[\lambda c\, \lambda w\, c_a \text{ is at } c_l \text{ in } w](c^*) = \lambda w\, [\text{Lingens is at } c^*_l \text{ in } w]$.

In the tradition of epistemic logic, we take an individual to believe a proposition just in case *each of the worlds w' compatible with his beliefs is one that makes that proposition true*. Applying this strategy to the contents of *S* and *S'*, we see that x believes the content of *S* just in case each of the worlds w' compatible with x's beliefs guarantees that [λw Lingens = Lingens](w') = true, which is of course always the case. So the content of *S* is one that anyone should believe. But things are different with *S'*: x believes the content of *S'* just in case each of the worlds w' compatible with x's beliefs guarantees that [λw Lingens is at c^*_l in w](w') = true, or in other words that Lingens is at c^*_l in w' - which is by no means trivial. In other words: the content of *S* of trivial, but that of *S*' isn't (in Perry's example, it is only because Lingens has read all the books and has perfect non-indexical knowledge that he knows that Lingens is at Stanford).

When we turn to the characters of these sentences, however, the situation is reversed: the character of *S* is non-trivial, whereas the character of *S'* is. But before we can make this point clear, we must ask *what it means to believe a character* in the first place. A common

assumption - though not one that Kaplan himself endorses - is that an individual i believes a character χ just in case *each of the contexts c compatible with what i believes guarantees that* $\chi(c)(c_w) = true$ (Haas-Spohn 1994); in other words, for each such context c, the character χ evaluated at that context *and at the world of that context* returns the value 'true'. This certainly makes intuitive sense: in essence, Lingens believes the character of *S* just in case each context compatible with his beliefs is one in which *S* is true in the sense of Assumption 2 of Section 1.1.1. This immediately derives the result that the character of *S'* is trivial while that of *S* isn't:

• Lingens believes the character of *S* (= *I am Lingens*) just in case every context c' compatible with his beliefs is one that guarantees that $[\lambda c\ \lambda w\ c_a = \text{Lingens}](c')(c'_w) = \text{true}$, i.e. that $c'_a = \text{Lingens}$. But this is precisely the kind of knowledge that Lingens *lacks*, so the character of *S* is certainly not one that Lingens believes.

• Lingens believes the character of *S'* (= *I am here*) just in case every context c' compatible with his beliefs is one that guarantees that $[\lambda c\ \lambda w\ c_a \text{ is at } c_l \text{ in } w](c')(c'_w) = \text{true}$, i.e. that c'_a is at c'_l in c'_w. But by definition of a context, this *is* trivial, and so everyone - including Lingens, despite his amnesia - believes the character of *S'*.

The same analysis carries over to a vivid example discussed by Kaplan. If David sees in the mirror someone that he doesn't recognize, but who happens to be David himself, there will be a considerable cognitive difference depending on whether he thinks *My pants are on fire* or *His pants are on fire*. Both sentences have the same content - they make the same claim about the world, namely that David's pants are on fire. But they have very different characters, which accounts for the cognitive difference between them.

Interestingly, in order to determine whether an individual does or does not believe a character χ, we need not have access to *all* of χ; rather, all that matters is what χ does to pairs of arguments of the form $<c, c_w>$ for any context c. In other words, all we need to have access to is the *diagonal* of the character χ, defined as follows:

(17) $\delta(\chi) = \lambda c\ \chi(c)(c_w)$

If χ is the character of a clause, the diagonal of χ can be identified with a set of contexts. And the analysis of belief as a relation between an individual and the diagonal of a character is *exactly* the traditional notion of belief inherited from epistemic logic, with the only difference that possible worlds are now replaced with a strictly more fine-grained type of entity, contexts[3].

1.1.3 Proper vs. Improper Contexts

Kaplan's analysis of *a priori* truth crucially depends on certain constraints on possible contexts; in particular, as was mentioned in (5), the agent of a context must by definition be at the location of the context at the time and in the world of the context (this is what guarantees that *I am here now* or *I exist* are *a priori* true). But this constraint might in some cases be too strong (Predelli 1998), for instance if (18) is heard on an answering machine:

(18) I am not here right now. Please leave a message after the tone.

Predelli suggests that one should countenance *improper contexts* to solve the problem – where a context is taken to be improper in case it violates Assumption 1 above (in Predelli's

[3] To give an example, the diagonals of *S* and *S'* are computed in (i) and (ii):
(i) $\delta(\text{Character}(S)) = \lambda c^*[\lambda c\ \lambda w\ c_a = \text{Lingens}](c^*)(c^*_w) = \lambda c^*\ c^*_a = \text{Lingens}$
(ii) $\delta(\text{Character}(S') = [\lambda c\ \lambda w\ c_a \text{ is at } c_l \text{ in } w](c^*) = \lambda w$ Lingens is at c^*_l in w.

example, the speaker may *fail* to be at the location of the context in the world of the context). This certainly makes very good sense; but when one adopts this measure, one immediately loses Kaplan's result that *I am here now* should be *a priori* (and for him *logically*) true. In order to regain Kaplan's result, we must define a notion of *a priori* knowledge that does not make reference to *all* contexts, but only to *proper* ones.

1.2 The Prohibition Against Monsters and Indirect Discourse

At this point there is nothing in our analysis to block the existence of operators that manipulate the context parameter - just like tense and modal operators manipulate the time and world parameters respectively. In fact, if the diagonal operator we defined above were made part of the *object* language, it would be precisely a Kaplanian monster. To define it in full generality within a semantics with time and world parameters, as well as individual variables, we posit the lexical rule in (19) (c is a context, s is an assignment function, t is a time parameter, and w is a world parameter):

(19) $[\![\delta\ F]\!]^{c,s,t,w} = \lambda c'\ [\![F]\!]^{c',s,t,c'w}$

(If contents are analyzed as functions from world-time pairs (rather than worlds) to truth values, it is more natural to define the diagonal operator in such that a way that it also shifts the time parameter, i.e. as $[\![\delta\ F]\!]^{c,s,t,w} = \lambda c'\ [\![F]\!]^{c',s,c't,c'w}$.)

It is immediate that any indexical that is caught in the scope of the object-language operator δ will be evaluated under a possibly non-actual context c', for various values of c'. In this case, our operator simultaneously shifts the context and the world parameters (and in the alternative definition also the time parameter); but only the context-shifting part is crucial to make it a Kaplanian monster.

Given that that δ is used so naturally in the meta-language to describe people's *attitudes*, one might expect that natural language makes use of something like this operator in the semantics of attitude *reports*. So why does Kaplan claim that such operators do not exist in natural language? Initially, there appears to be overwhelming empirical evidence for this conclusion: in English, it is difficult to find operators that can shift the context with respect to which indexicals are evaluated. This is most easily seen by contrasting the semantic behavior of *I* with that of the definite description *the person talking* which, unlike the former, depends on the time and world of evaluation rather than on the context of utterance:

(20) a. At some point, the person talking was tired.
=> need not be a claim about the speaker
b. At some point, I was tired.
=> must be a claim about the speaker.

Now it could be argued that the operator or quantifier *at some point* is just not the right expression to shift the context parameter. But Kaplan argues that similar facts obtain with other operators, which suggests that such a shift simply cannot be effected:

(21) a. In some contexts / speech situations, the person talking was tired.
=> need not be a claim about the speaker
b. In some contexts / speech situations, I was tired.
=> must be a claim about the speaker.

Taking a hint from our analysis of attitudes a few paragraphs back, we could hope that attitude verbs might be more successful context shifters; but initial evidence suggests the contrary:

(22) John believes / claims that I am tired.
=> must make a claim about the speaker, not about John.

Arguably there are cases in which *I* can be used with a shifted reading, in particular in newspaper articles:

(23) Mr Greenspan said he agreed with Labor Secretary R.B. Reich "on quite a lot of things". Their accord on this issue, he said, has proved "quite a surprise to both of us"
(Cappelen and Lepore 1997)

But such examples might be better analyzed as instances of partial quotation, whose use is justified by considerable pragmatic pressure: it is very important for a journalist to quote the person's precise words in order to be accurate, even if this is done at the expense of the grammar of natural language (see Anand 2006 for a more detailed discussion of partial quotation in this context).

We will see shortly that *some* attitude operators can be found which can shift the context parameter in much more ordinary contexts. Before we get there, however, we should say a word about the standard view of indirect discourse.

• The first observation is that *attitude reports appear to be strictly less fine-grained than attitudes are*. As we observed before, there is an important difference between thinking *My pants are on fire* or *His pants are on fire*, even in case both possessive pronouns refer to the same individual. Still, in indirect discourse both situations can be reported by saying: *John thinks that his pants are on fire* (where *his* refers to John):

(24) John thinks: 'My pants are on fire'
John thinks: 'His pants are on fire'
(where 'his' refers to John)
→ John says that his pants are on fire

• Kaplan accounts for this observation by positing a semantics in which *John thinks that his pants are on fire* is true just in case there is *some* character which John asserts, and whose content in the context of John's thought act is that John's pants are on fire (we disregard time dependency):

(25) *John says that his pants are on fire* (where *his* denotes John) is true in world w* iff there is a character χ such that:
(i) the content of χ given the context of John's speech act (call it *c*) is that John's pants are on fire: $\chi(c) = \lambda w$ John's pants are on fire in w, and
(ii) John asserts χ in w*.

There are two ways in which this analysis could be extended: first, it could presumably be applied to other attitude verbs, such as *believe*, rather than just to verbs of saying; second, one may wish to give a reductive analysis of what it means to 'assert' or to 'believe' a character, using the diagonal operator defined above. Applied to belief reports, this extension leads to the following analysis:

(26) *John believes that his pants are on fire* (where *his* denotes John) is true (at time t* in world w*) iff there is a character χ such that:
(i) the content of χ given the context of John's thought act (call it *c*) is that John's pants are on fire: $\chi(c) = \lambda w$ John's pants are on fire in w, and

(ii) for each context c' compatible with John's belief in w*, $[\delta(\chi)](c') = \text{true}$, i.e. $\chi(c')(c'_w) = \text{true}$.

As Stechow & Zimmermann 2005 show (following Crimmins 1998), this semantics makes the unfortunate prediction that *John believes that his pants are on fire* should be true as soon as John's pants really are on fire. Consider (27), calling its character $\chi*$ (where *actually* has the semantics defined above):

(27) It is either not so that John's pants are actually on fire, or else John's pants are on fire.

The problem is that any rational individual can realize that (27) uttered in a context c and evaluated in the world c_w of c is true. This is because $\chi*(c)(c_w)$ is true just in case: John's pants are not on fire in c_w, or John's pants are on fire in c_w - which is a tautology. Thanks to the *actually* operator, however, the *content* of $\chi*$ in c is $\chi*(c) = \lambda w$ [John's pants are not on fire in c_w or John's pants are on fire in w]. With the assumption that John's pants are in fact on fire in c_w, we get: $\chi*(c) = \lambda w$ [John's pants are on fire in w]. So with the rule in (26), we predict that the sentence *John believes that his pants are on fire* should be true - no matter what John's beliefs really are! The analysis has gone wrong; we will soon explore an alternative.

Before we get to actual cases of context shift, it is important to be clear about one class of examples which it would be incorrect to analyze in this way. Heim (1991) noted that indexical pronouns can sometimes display the behavior of bound variables:

(28) Only I did my homework.
a. *Reading 1:* [only I] λx x did x's homework
b. *Reading 2:* [only I] λx x did my homework
(note that on Reading 1 the variable must range over non-speakers)

On superficial inspection, it may seem that on the bound reading the possessive pronoun fails to denote the speaker, and thus that some form of context shift is taking place. A much better hypothesis, however, is that in this particular configuration the person features of the bound pronoun can remain uninterpreted. Why this is so is a complex matter, but it is clear that this phenomenon *is by no means restricted to indexical features:* the same generalization holds in (29) of the pronoun *her*, which on its bound reading may range over non-female individuals.

(29) Only Mary did her homework
a. *Reading 1:* [only Mary] λx x did x's homework
b. *Reading 2:* [only Mary] λx x did Mary's homework

We will henceforth leave these examples aside (but see for instance Heim 2007, Kratzer 2008 and Rullmann 2003, 2004, 2008 for recent discussions).

2. De Se Readings

Kaplan's analysis of indirect discourse is challenged by two kinds of cases. In this section, we consider examples in which the *truth conditions* predicted by his analysis are incorrect. In Section 3 we will consider cases that involve not just truth conditions but also *indexical morphology* (see also Sauerland 2007 for an introduction to the semantics indirect discourse).

2.1 The Existence of De Se Readings: PRO

As it turns out, there are English constructions that make it possible to *distinguish* in indirect discourse between thoughts or sentences that have different characters but the same content. Specifically, PRO, the unpronounced subject of an infinitive embedded under an attitude verb, is always understood to report a first-person (or second-person) thought (Morgan 1970, Chierchia 1987), as is illustrated in the following scenario.

(30) John is so drunk that he has forgotten that he is a candidate in the election. He watches someone on TV and finds that that person is a terrific candidate, who should definitely be elected. Unbeknownst to John, the candidate he is watching on TV is John himself.
a. True: John hopes that he will be elected
b. False/#: John hopes PRO to be elected
(by contrast, b. this is ok in a scenario in which the thought was: 'I should be elected')

Arguably, similar facts hold in the second person:

(31) At a party, John is told that somebody named 'Mary' is being particularly obnoxious. He tells the person he is having a conversation with: 'Mary should leave'. But that person is none other than Mary herself.
a. True: John told Mary that she should leave
b. False/#: John told Mary PRO to leave
(by contrast, b. is ok if the discourse was: 'Leave!').

Interestingly, an artificial pronoun very much like PRO, called *he**, was posited by the philosopher Castañeda for purely conceptual reasons (Castañeda 1966, 1967, 1968). In effect, PRO embedded under an attitude verb is an English realization of Catañeda's *he** (in other environments, however, PRO has different uses; but we will see below that in languages that have logophoric pronouns *he** is unambiguously instantiated). It should be added that Szabolcsi (2009) argues that *overt* instances of PRO in other languages must equally be read De Se (she further that the semantics of the infinitive rather than the lexical semantics of *PRO* is responsible for the De Se effect).

Since Kaplan's analysis of indirect discourse was designed to *predict* that such distinctions cannot be made in indirect discourse, it is ill-suited to account for these contrasts. In the semantic literature, scholars have generally followed Chierchia (1987) in taking these data to show that the semantics of attitude reports is more fine-grained than was usually thought in possible worlds semantics. The idea is that the value of a clause embedded under an attitude verb may be as fine-grained as a set of triples of the form <individual, time, world>. It is immediate that such triples are homologous to contexts. Technically, however, no syntactic or morphological connection to indexicality was posited in Chierchia's treatment. Rather, it was assumed that a λ-operator could appear at the 'top' of the embedded clause to bind an individual variable. For simplicity, we represent this operator above an empty complementizer C, though this is just for notational convenience:

(32) John hopes λi C PRO_i to be elected

The crucial assumption is that, in attitude reports, PRO must always be bound by the closest λ-operator:

(33) Syntactic condition on PRO
When embedded under an attitude verb, PRO must be bound by the closest c-commanding λ-operator.

The syntactic condition has the effect of ruling out (34) while allowing for (34):

(34) a. *John λi hopes λk C PRO_i to be elected
b. *John hopes λk C PRO_i to be elected
c. John λi hopes λk C PRO_k to be elected
d. John hopes λk C PRO_k to be elected

To obtain interpretable structures, we must still say what the role of the complementizer is. We will assume that it simply returns a proposition when applied to a clause (in type-theoretic terms, it returns a function of type <i, <s, t>>, which takes a time argument (of type i) and a world argument (of type s) to yield a truth value).

(35) a. $[\![\text{C F}]\!]^{c, s, t, w} = [\![\text{that F}]\!]^{c, s, t, w} = \lambda t'_i \, \lambda w'_s \, [\![\text{F}]\!]^{c, s, t', w'}$

Combined with the Logical Form in (32), this semantics guarantees that the embedded clause denotes a function of type <e, <i, <s, t>>>, where e is the type of individuals; this function can be assimilated to a set of triples of the form <individual, time, world>; and as noted such triples are homologous to contexts:

(36) $[\![\lambda i \text{ C } PRO_i \text{ to be elected}]\!]^{c, s, t, w} = \lambda x'_e \, \lambda t'_i \, \lambda w'_s \, [\![\text{F}]\!]^{c, s[i \rightarrow x'], t', w'}$

This makes it possible to apply to the object-language operators *believe*, *hope*, etc., the very same semantics we introduced to describe attitudes (rather than attitude reports) in Section 1.1.2: an individual x stands in the 'believe' relation to a set F of contexts just in case each *context* (rather than *world*) compatible with what x believes is in F. This is precisely the semantics we adopt in (37), with minor changes due to the fact that F is essentially characterized as a set of triples rather than as a set of contexts.

(37) a. $[\![\text{believes}^{\text{De Se}}]\!]^{c, s, t, w} (F_{<e, <i, st>>})(x) = \text{true}$
iff for each context c' compatible with what x believes at t in w, $F(c'_a)(c'_t)(c'_w)$ = true
b. $[\![\text{hope}^{\text{De Se}}]\!]^{c, s, t, w} (F_{<e, <i, st>>})(x) = \text{true}$
iff for each context c' compatible with what x hopes at t in w, $F(c'_a)(c'_t)(c'_w)$ = true

It follows that *John hopes to be elected* is true just in case John stands in the 'hope' relation to the *diagonal* of the sentence *I be-elected*. More precisely, we see in (38) that the conditions under which the first sentence is true are exactly those under which John stands in the 'hope' relation to this diagonal, which we call Δ.

(38) a. $[\![\text{John hopes}^{\text{De Se}} \lambda i \text{ C } PRO_i \text{ to be elected}]\!]^{c, s, t, w}$
$= [\![\text{hopes}^{\text{De Se}} \lambda i \text{ C } PRO_i \text{ to be elected}]\!]^{c, s, t, w} (j)$
$= [\![\text{hopes}^{\text{De Se}}]\!]^{c, s, t, w} (j)([\![\lambda i \text{ C } PRO_i \text{ to be elected}]\!]^{c, s, t, w})$
$= [\![\text{hopes}^{\text{De Se}}]\!]^{c, s, t, w} (j)(\lambda x_e \, [\![\text{C } PRO_i \text{ to be elected}]\!]^{c, s[i \rightarrow x], t, w})$
$= [\![\text{hopes}^{\text{De Se}}]\!]^{c, s, t, w} (j)(\lambda x_e \, \lambda t' \, \lambda w' \, [\![PRO_i \text{ to be elected}]\!]^{c, s[i \rightarrow x], t', w'})$
$= [\![\text{hopes}^{\text{De Se}}]\!]^{c, s, t, w} (j)(\lambda x_e \, \lambda t' \, \lambda w' \text{ x is elected at t' in w'})$
= true iff for each context c' compatible with what j hopes at t in w, $[\lambda x_e \, \lambda t' \, \lambda w'$ x is elected at t' in w'$](c'_a)(c'_t)(c'_w)$ = true,
iff for each context c' compatible with what j hopes at t in w, c'_a is elected at c'_t in c'_w.

b. $\Delta = [\![\delta \text{ [I be-elected] }]\!]^{c, s, t, w} = \lambda c' \; [\![\text{I be-elected}]\!]^{c', s, c'_t, c'_w}$
$= \lambda c' \; c'_a$ is elected at c'_t in c'_w
John stands in the 'hope' relation to *Δ* iff for each context c' compatible with

what j hopes at t in w, $\Delta(c') = 1$,
iff for each context c' compatible with
what j hopes at t in w, c'_a is elected at c'_t in c'_w.

To be complete, this analysis would have to be supplemented with an account of morphological agreement. In a nutshell, the difficulty is that even though PRO is bound by an operator in the embedded clause, it still inherits its morphological features from an argument of the matrix clause. The details are somewhat stipulative on every account, but there is some evidence that the features in question remain uninterpreted:

(39) a. John, a transsexual, PRO hopes to become a woman and to buy himself / *herself a car.
b. All candidates think that they are going to win.

Although in (39) the semantics should permit the feminine features of *herself* to be interpreted (because in each context compatible with what John hopes, he is a woman), we see that the masculine pronoun must in fact be employed; it is plausible that it inherits its features from PRO, which in turn has to receive them from *John* - despite the fact that the De Se analysis crucially posits that *PRO* is *not* bound by *John*. The same reasoning arguably applies to (39): although each candidate has a singular De Se thought (*I will win),* the plural must still be employed in the embedded clause. The details of the agreement mechanism are complex and should in part be determined by considerations that go beyond the present article (see for instance Heim 1991, 2005, 2007, Kratzer 1998, von Stechow 2002, 2003, Schlenker 1999, 2003, Anand 2006 and Rullmann 2008 for discussion).

It has sometimes been suggested that similar agreement rules apply to the features of pronouns and to those of tense, which in some languages is known to remain uninterpreted under past tense attitude verbs:

(40) Yesterday John decided that tomorrow at lunch time he would tell his mother that they <u>were</u> having their last meal together. (after Kamp and Rohrer 1983)

The underlined past tense refers to an event that occurs *after* all the other events mentioned in the sentence, and thus the past tense features of this verb are presumably uninterpreted (see for instance Ogihara 1996, Abusch 1997, Kratzer 1998, Schlenker 1999).

Importantly, the observations we just made about *PRO* need not entail anything about the nature of indexicality, because there is no reason to treat *PRO* as an indexical expression; rather, it appears to be a variable that imposes certain conditions on its binder. So to summarize the discussion at this point:
(i) The data we have considered are entirely compatible with Kaplan's prohibition against monsters.
(ii) However, Kaplan's analysis of indirect discourse is falsified by the existence of De Se readings.
As we will see below, it turns out that there *is* strong evidence that some attitude verbs can embed clauses that include the diagonal operator, or something similar to it.

2.2 De Se vs. De Re

Before we go any further, we should make the relation between De Se and De Re readings somewhat more precise.

2.2.1 De Se vs. De Re and Binding

It is sometimes believed that the distinction between De Se and De Re readings can be reduced to that between binding and 'accidental coreference'. *This is incorrect:* the De Se/De Re distinction can be replicated when every pronoun is bound by a quantifier, as shown below:

(41) a. Every candidate hopes that he will be elected.
b. Every candidate hopes to be elected.

(41) requires that every candidate's hope be of the form: *I will be elected* (in the first person). No such requirement holds in (41). This is expected under the present approach, since two Logical Forms can be generated, each of which involves bound variables:

(42) a. Bound Reading, De Re
[every candidate] λi t_i hope λk that he_i is elected.
b. Bound Reading, De Se
[every candidate] λi t_i hope λk C PRO_k to be elected.

2.2.2 A De Re Reading is a compatible with a De Se situation

What is the precise logical relation between a De Se and a De Re reading? The accepted answer in the literature is quite simple: *De Se readings are strictly stronger than De Re readings* because any situation compatible with the former is compatible with the latter, but not vice versa.

To see that a De Re attitude is compatible with a situation in which the agent has a De Se attitude, consider a mixed case, in which some candidates think: *I should be elected*, while others think (about themselves, though without realizing it): *He should be elected* (Zimmermann 1991). The sentence *Every candidate hopes that he is elected* would seem to be true in this situation. But the embedded *he* cannot be read De Se, or else the sentence would come out as false. Thus *he* is read De Re. This suggests that a De Re reading is compatible with a De Se situation. The near-consensus is that this holds true in all cases[5].

This result is not unexpected when one considers in greater detail the standard analysis of quantification across attitude reports. The basic problem, laid out in Quine (1956), is that in the following situation we might both want to say that Ralph believes, of Ortcutt, that he is a spy; and that Ralph believes, of Ortcutt, that he is not a spy:

> There is a certain man in a brown hat whom Ralph has glimpsed several times under questionable circumstances on which we need not enter here; suffice it to say that Ralph suspects he is a spy. Also there is a gray-haired man, vaguely known to Ralph as rather a pillar of the community, whom Ralph is not aware of having seen except once at the beach. Now Ralph does not know it, but the men are one and the same. Can we say of *this man* (Bernard J. Ortcutt, to give him a name) that Ralph believes him to be a spy? (Quine 1956; 179)

On the assumption that Ralph's beliefs are closed under conjunction, catastrophic results follow if we analyze *Ralph believes of Ortcutt that he is a spy* and *Ralph believes of Ortcutt that he is not a spy* truth-conditions as in (i) and (ii):

[5] There are weak arguments in favor of the opposite conclusion in Schlenker 1999.

(i) every context c compatible with what Ralph believes (at the time of utterance in the actual world) satisfies: Ortcutt is a spy at c_t in c_w;
(ii) every context c compatible with what Ralph believes (at the time of utterance in the actual world) satisfies: Ortcutt is not a spy at c_t in c_w.
It follows from (i) and (ii) that no context whatsoever is compatible with Ralph's beliefs - a result that normally obtains with irrational individuals, who believe both a proposition and its negation. But this is not Ralph's case - his only failing is that he doesn't realize that the individuals he saw in different circumstances are one and the same.

Kaplan 1969 solved the problem by analyzing quantification across attitude reports in existential terms. In a nutshell, the sentence *Ralph believes, of Ortcutt, that he is a spy* was taken to be true just in case there is some description (or 'mode of presentation') *D* of Orctutt such that Ralph believes something of the form: *D is a spy* (in the final analysis, the existential quantification over *D* must be further restricted). The key to Kaplan's analysis is that the combination of the following statements does *not* entail that Ralph holds contradictory beliefs:

(43) a. For some description D of Ortcutt, Ralph believes: *D is a spy*.
b. For some description E of Ortcutt, Ralph believes: *E is not a spy*.

Let D* be a description that 'witnesses' the truth of (a), and let E* be a description that witnesses the truth of (b). If D* ≠ E*, we obtain no implication that Ralph should hold contradictory beliefs.

As Kaplan observes, the analysis must be constrained on pain of making incorrect predictions. Anybody would agree that *the shortest spy is a spy*, but we wouldn't therefore want to conclude that everybody believes of the shortest spy (say, Smith) that he is a spy. For this reason, Kaplan adds a condition to ensure that the existential quantification is over 'vivid' descriptions, where 'vivid' is a cover term for various constraints whose form is largely left unspecified. Still, no matter how one explicates the term, it would seem that one stands in a *very* vivid relation to oneself. If so, the description *the person identical to me* should always count as a 'vivid' description. But this goes to show that any De Re pronoun should in principle be compatible with a De Se situation, in which the agent holds a first person thought (e.g. *I should be elected*).

There is currently no particularly elegant way to implement Kaplan's analysis - all accounts need important stipulations. Here we go for a syntactic one: De Re terms of type e in attitude reports are syntactically replaced with a variable of type <e ,<i, <s, e>>> (abbreviated as eise), as is illustrated in (44), which can be thought of as an 'acquaintance relation' which associates to every individual e, time i and world s the individual that stands in a certain relation to e, i, w (we call this the 'De Re' transformation).

(44) a. Ralph believes that Ortcutt is a spy, *analyzed as*:
b. Ralph believe λi that Ortcutt be-a-spy
c. [$\exists\delta_{eise}$: R(δ)(Ortcutt)(Ralph)] Ralph believe λi that δ(i) be-a-spy[6]

Here R(δ)(Ortcutt)(Ralph)] indicates that:
a) δ is a description of Ortcutt when evaluated in the context of Ralph's thought act.
b) δ is 'vivid' in the context of Ralph's thought act.

---

[6] Thanks to the rule in (35), repeated as (i), the complementizer *that* is interpreted as follows:

(i) $[\![\text{that F}]\!]^{c,s,t,w} = \lambda t'_i \lambda w'_s [\![F]\!]^{c,s,t',w'}$

Since δ(i) is in the scope of *that*, its (implicit) time and world argument will have been introduced by the complementizer, as is desired.

In Quine's example, δ could for instance correspond to the description *the man I saw at the beach*, or *the man I saw wearing a brown hat*.

It should be noted that some authors take δ to be a free variable whose value must be provided by the discourse situation; under such an analysis, a simpler Logical Form is obtained:

(45) Ralph believe λi that δ(i) be-a-spy

Under this simpler analysis, it is left to the context to provide reasonable constraints on what the implicit description can be.

2.2.3 Does *he* have a De Se reading?

It turns out to be difficult to determine whether a pronoun like *he*, which is known to have a De Re reading, *also* has a De Se reading (the situation was much simpler with PRO, which simply does not have a De Re reading). Most researchers believe that it does, but the argument is subtle. The problem is a standard one in semantics: *John thinks that he will win the election* uncontroversially has a De Re reading; and we wish to determine whether it also has a De Se reading, which is logically stronger than the De Re one. The difficulty is that any situation that verifies the De Se reading will equally verify the De Re reading. On the other hand, if a situation makes the De Se reading false but the De Re reading true, a charitable interpreter might well select the De Re reading to maximize the truth of the speaker's utterance, and thus even if the De Se reading exists, we will fail to 'see' it. Percus & Sauerland (2003a, b) solve the problem by using quantified examples (or rather an example with *only*, which has a quantificational semantics):

(46) A group of drunken election candidates watching campaign speeches on television do not recognize themselves in the broadcast. John, the only confident one, thinks "I'll win", but does not recognize himself in the broadcast. Bill and Sam, both depressive, think "I'll lose" but are impressed by the speeches that happen to be their own and are sure "*that* candidate" will win. Peter, also depressive, happens to be impressed not by his own speech but by John's.

Only John thinks that he will win.

Percus & Sauerland give the sentence as true in the situation at hand, and they argue that this proves the existence of the De Se reading of *he*. To understand their argument, we must consider the various conceivable Logical Forms and argue that the judgment couldn't be accounted for if *he* only had a De Re reading.

(47) LF1: [Only John] λi t_i thinks λk that he_m will win, where *m* denotes John (De Re, free)
LF1': [Only John] λi [$\exists\delta_{eise}$: R(δ)(m)(m)] t_i thinks λk that δ(k) will win
LF2: [Only John] λi t_i thinks λk that he_i will win (De Re, bound)
LF2': [Only John] λi [$\exists\delta_{eise}$: R(δ)(i)(i)] t_i thinks λk that δ(k) will win
LF3: [Only John] λi t_i thinks λk that he_k will win (De Se)

If only De Re readings were available, the sentence could only be analyzed as LF1 or LF2 - and thus as LF1' or LF2' after the De Re transformation has been applied. But LF1' is predicted to be false, because Peter does have a De Re belief that John is going to be elected. Similarly, LF2 is predicted to be false, because Bill and Sam each thinks about himself - De Re - that he is going to be elected. By contrast, if *he* can have a De Se reading, LF3 should be

available too; and it is correctly predicted to be true, since only John has a De Se thought of the form: *I will be elected* (none of the other individuals has a De Se belief that he himself will be elected)[7].

It should be noted that there have been attempts to take the De Re Logical Form as basic, and the De Se reading as derivative. Of course all such accounts must explain why *PRO* only has a De Se reading; there are several possible directions:

• Syntactically, one could decide to represent in the Logical Form both the De Re nature of the reading *and* the 'implicit description' under which it is obtained (see for instance Schlenker 2003).

• One could also give a pragmatic account of the distinction; this is attempted in particular in Maier (2006) (following an earlier suggestion by Reinhart 1990). But something still needs to be said to explain why PRO is unambiguously read *De Se*; in Maier's framework, certain pronominal entries specify constraints that must be satisfied by the acquaintance relation that gives them their denotation (Maier also applies this device to shifted indexicals).

2.2.4 Syntactic Constraints on De Se Readings

Since in the present analysis a De Se reading is obtained by binding a variable to a λ-abstractor introduced by an attitude operator, there could in principle be further syntactic constraints on the relation between a De Se pronoun and its antecedent. Percus & Sauerland (2003b) claim that such constraints exist in dream reports, as in (48):

(48) a. John dreamed that he was marrying his granddaughter.
b. John dreamed that his granddaughter was marrying him.

They argue on the basis of intricate scenarios that if *he* is read De Re in (48), *his* must be read De Re as well; by contrast, even when *him* is read De Re in (48), *his* can still be read De Se. They conclude that a De Re pronoun pro_1 that refers to an attitude holder x can block the De Se reading of the pronoun pro_2 in the configuration *[x dreams that ... pro_1 ... pro_2...]* if pro_1 c-commands pro_2 ('Oneiric Reference Constraint'). This constraint is further discussed by Hardt (2003) and Anand (2006), who suggests that it is an instance of a more general condition (the 'De Re Blocking Effect'), which has analogous effects on some logophoric pronouns, and ultimately derives from economy constraints on binding discussed in Fox (2000).

3. Monsters and Shifted Indexicals

In this section, we suggest that Kaplan's analysis was not just wrong about De Se readings, but also about monsters: there are languages in which (some) attitude operators behave like Kaplanian monsters (a conclusion consonant with Israel & Perry 1996). But how can we establish the existence of such beasts? We will discuss examples that have the form of (49), where <I> and <here> are indexicals such as *I* and *here*:

---

[7] There are two difficulties with this argument. First, one could argue that there is no separate De Se reading, but that a De Re reading can 'emulate' a De Se reading if the quantification over implicit descriptions has a very narrow implicit restriction, one that only includes the description *the person identical to the speaker/thinker*. This yields a pragmatic variant of a De Se analysis. Second, the same conclusion may be reached if implicit descriptions are provided by the context rather than existentially quantified. Thus the existence of a syntactically encoded De Se reading for *he* is not easy to settle.

(49) John says that ... <I> ... <here> ...

The argument will have three steps, each of which is compulsory if the claim that a monster has been sighted is to have any substance.

(i) First, by inspecting the truth conditions, we argue that this hypothesis is *compatible* with the semantics of the sentence. Often one only checks that the shifted indexical has roughly the right meaning - for instance that in *John says that I am a hero* the embedded pronoun intuitively refers to John rather than the actual speaker. But within the present framework, a *bona fide* shifted indexical should obligatorily be read *De Se*; if possible, then, the De Re / De Se distinction should be considered when shifted indexicals are discussed (this is admittedly difficult when one cannot do detailed fieldwork on the relevant constructions).

(ii) Second, we will have to exclude the possibility that the embedded clause is quoted. On almost any theory, it is unsurprising that *John says: 'I am a hero'* attributes to John a (De Se) claim about John himself. This is because in cases of quotation, the verb *say* can be taken to establish a relation between an individual and a string of words, rather than between an individual and the *meaning* of the embedded clause (this explains why meaningless strings can be quoted in direct discourse but not used in indirect discourse; thus it makes sense to say: *John said: 'Glubibulga'*, but not: *John said that glubibulga*). In English, the presence of the complementizer *that* rules out such a quotative reading, but other languages could conceivably have quotative complementizers, and thus some care is needed to exclude the possibility that the embedded is simply quoted.

Fortunately, there are several ways to *force* a clause to be used rather than mentioned. The key observation is that quotations are generally 'opaque' to grammatical processes; as a result, grammatical dependencies cannot normally 'cross' quotation marks. Two examples are provided below; for illustrative purposes, we use the English sentence *John says I like cheese* as a test case. Without punctuation (or special intonation), the sentence is ambiguous: one reading is quotational: *John says: 'I like cheese'*. The other reading is non-quotational: *John says <that> I like cheese*. One could be tempted to posit that the first reading involves a Kaplanian monster, but this hypothesis would soon be refuted by the observation that *I* obligatorily refers to the actual speaker when a grammatical dependency crosses the boundaries of the embedded clause - forcing the latter to be used rather than quoted. This explains why in this simple example *I* is disambiguated when an interrogative element is extracted from the embedded clause, or when it includes a Negative Polarity Item licensed by a matrix negation:

(50) a. What did John say I ate?
Ok Non-shifted Reading: What did John say I (= the speaker) ate?
**Shifted Reading:* What did John say he (= John) ate?

b. John didn't say I ate any cheese.
Ok Non-shifted Reading: John didn't say I (= the speaker) ate any cheese.
**Shifted Reading:* John didn't say he (= John) ate any cheese.

We will see that the same tests argue in other languages for the existence of *bona fide* shifted indexicals.

(iii) Finally, we will want to exclude the possibility that the purported indexicals are in fact anaphoric elements. This is no trivial matter: anaphoric expressions can often have, among others, a deictic reading, whereby they pick their denotation from the context. What distinguishes such anaphoric elements from *bona fide* indexicals is that the latter can never

have unambiguously anaphoric readings. To make the point concrete, consider the behavior of the adverbial *later*:

(51) a. I'll go for a walk later.
b. This morning, John promised that he would go for a walk later.
c. I met John yesterday morning. Later he went for a walk.
d. Whenever John makes a mistake, he later owns up to it.

In (51), *later* is evaluated with respect to the time of utterance; this is compatible with two hypotheses: *later* could have an indexical component, which must be evaluated with respect to a context; or it could have an anaphoric element, which can pick out as its denotation any salient moment - including in some cases the time of speech. In (51), *later* is evaluated with respect to the time of John's speech act; this is compatible with either hypothesis, *on condition* that we add to the first hypothesis that *later* is a shiftable indexical. But in (51), we see that *later* has an anaphoric rather than an indexical behavior, since it can be evaluated with respect to a salient moment which is not the time coordinate of any context. *Later* behaves as if it had a concealed variable argument (= *later than t*), whose value may be provided by the context or by a linguistic antecedent.

As was shown earlier, the De Se semantics we postulated for attitude verbs makes it conceivable that they (or operators they associate with) might be monsters. In the rest of this section we claim that this is indeed the case in some constructions. No claim is made to exhaustivity; there are for instance relevant data for Engenni in Thomas (1978); for Aghem in Hyman (1979); for Navajo in Hale & Platero (1998) and Speas (1999)[8]; for Ancient Greek in Bary & Maier (2003); for Ancient Egyptian in Kammerzell & Peust (2002); for American Sign Language in Lillo-Martin (2009); for Catalan Sign Language in Quer (2005); for Italian Sign Language in Zucchi (2004). (Recanati 2004 discusses further possible cases of context shift.)

3.1 Pure Monsters: Operators that Manipulate the Context Parameter

Let us suppose, for the moment, that the lexical entry we posited for *say* remains fixed, but that a monstrous construction can be obtained by combining *say* with the diagonal operator δ which we hypothetically introduced in the object language in (38). We also saw that such a Logical Form is easily interpreted by our existing rules:

(52) John say δ I be a hero.

What should be the behavior of such a construction?

---

[8] Thomas 1978 uses the term 'semi-indirect discourse' to refer to such examples, which are difficult to classify as involving either 'direct' or 'indirect' discourse, at least on a traditional analysis of indexicals. As she observes, in (ia) the embedded 2nd person pronoun suggests that direct discourse is used, while the embedded 3rd person pronoun argues for indirect discourse. The same point is made by Hyman 1979 concerning (ib) (the 2nd person pronoun is evaluated with respect to the context of the reported speech act, but the presence of the 3rd person logophoric pronoun indicates that the embedded clause is not quoted).

(i) a. ò wei ga ... bhú tou eì ka òkì nàà ìwó wu zà
2-sub 3(-ref)-obj 3-ref-sub 2-obj
he say [sp you should-take him seq he and you should-die stay]
'He said, "Look after me, and I will die with you"' or
'He said that she should look after him, and he would die with her' [Engenni, Kwa; Thomas 1978]
b. wìzÍn 'vÚ ndzÈ à wÍn NÍ'á **é** Ngé 'lÍghá **wò**
[woman that] said to him [that LOG-3 much like you]
'the woman said to him that she liked him a lot', or
'the woman said to him "I like you"' [Aghem, Bantu; Hyman 1979]

(i) First, we should be able to find some expressions that (a) qualify as indexicals, and yet (b) receive a shifted interpretation precisely when they are embedded under *say*.

(ii) Second, whenever one indexical gets shifted in this way, we expect that all other indexicals that appear in the scope of the same attitude operator should be shifted as well. This is because shifting is only possible if the diagonal operator is present; but because the latter is a simple modal operator, it shifts the context of evaluation of *all* indexicals that are in its scope. This has two consequences: when two indexicals are in the same clause, they must 'shift together', as stated in (53).

(53) Shift Together (Anand & Nevins 2004)
If an indexical is shifted in the scope of a modal operator, all other indexicals in the same clause must be shifted as well.

... attitude verb ... δ [... shifted indexical$_1$ .... shifted indexical$_2$ ...]

(iii) Third, since δ is a simple *modal* operator, once it has shifted the value of the context parameter, the latter's original value is lost once and for all - and no expression found in the scope of δ may recover the initial context parameter. In other words, the pattern represented in (54) is predicted to be impossible:

(54) No Intervening Binder (Anand & Nevins 2004, Anand 2006)
*[... attitude verb δ [... shifted indexical attitude verb ... [... non-shifted indexical ...]]]

Anand & Nevins (2004) and Anand (2006) convincingly show that both properties are in fact satisfied by the verb *vano* ('say') in Zazaki, an Indo-Iranian language on which they did original fieldwork. There is just one complication: *vano* can but need not select the operator δ. For the rest, the data are as predicted. Anand (2006) presents an extensive survey, as well as detailed scenarios designed to test for the availability of the various readings. We only provide a brief summary of his conclusions.

(i) Zazaki indexicals can shift in constructions that rule out quotation, as indicated by extraction and NPI-licensing tests (it can be shown independently that *kes* is indeed a negative polarity item):

(55) Extraction in Zazaki

i. čɛnɛkɛ [kɛ Hɛseni va **mɨ** *t* paci kɛrda] rindɛka
girl that Hesen said I *t* kiss did pretty.be-PRES
'The girl that Hesen said {Hesen, I} kissed is pretty.' (Anand and Nevins, 2004)

ii. Piyaa-o [kɛ Rojda va kɛ **mɨ** *t* paci kɛrd] Ali biyo
Person that Rojda said that I *t* kiss did Ali was
'Ali was the person that Rojda said {Rojda, I} kissed.' (Anand and Nevins, 2004)

(56) NPI licensing in Zazaki

a. Rojda ne va kɛ **mɨ** kes paci kɛrd
Rojda not said that I anyone kiss did
'Rojda didn't say that she kissed anyone.' (Anand and Nevins, 2004)

b. Tawa Alii va kɛ **mɨ** kes paci kɛrd
Q Ali.OBL said that I anyone kiss did
'Did Ali say that I kissed anyone?' OR
'Did Ali say that he kissed anyone?'

(ii) It can also be checked that in any given clause, either all indexicals are shifted, or none is, as shown in (57). In sentences with multiple clauses, if a shifted indexical appears under an attitude verb, indexicals that appear under lower attitude verbs must be shifted as well, as shown in (58).

(57) Zazaki obeys Shift Togeter

vizeri Rojda Bill-ra va kɛ **ɛz to**-ra miradiša (Anand and Nevins, 2004)
yesterday Rojda Bill-to said that I you-to angry.be-PRES
'Yesterday Rojda said to Bill, "I am angry at you." '
'Yesterday Rojda said to Bill, "AUTH(c) is angry at ADDR(c)." '
'*Yesterday Rojda said to Bill, "AUTH(c) am angry at you." '
'*Yesterday Rojda said to Bill, "I am angry at ADDR(c)." '
(AUTH(c) and ADDR(c) refer to the author and addressee of the actual context)

(58) Zazaki obeys No Intervening Binder

(Andrew$_U$): Ali$_A$ mi$_U$-ra va kɛ Hɛseni$_H$ **to$_U$-ra** va ɛz$_{\{H,A,*U\}}$ braye Rojda-o
Ali me-to said that Hesen you-to said I brother Rojda-GEN
'Ali said to Andrew that Hesen said to Andrew that {Hesen, Ali, *Andrew} is Rojda's brother.' (Anand and Nevins, 2004)

(U refers to the Utterer – in this case Andrew; A refers to Ali, and H refers to Hesen)

These data fall out nicely from a monstrous analysis, but they are very difficult to explain for other accounts. Let us just mention two.

• One could try to explain away these Zazaki data in terms of partial quotation. The analysis would posit that for some reason Zazaki allows some words - in particular indexicals - to be quoted within a clause which is itself used rather than mentioned. On this view, then, (56) would be analyzed as *Rojda didn't say that "I" kissed anyone*, with partial quotation of *I*, under a semantics that would have to be determined. This would explain why the first person pronoun appears to refer to someone other than the actual speaker. But this would *fail* to account for *Shift Together* and *No Intervening Binder*. In addition, Anand (2006) notes that a partial quotation analysis predicts that the report is faithful to the *words* used by the agent of the reported speech act, whereas the monstrous analysis does not impose such a condition – and correctly so, as Anand argues on the basis of a detailed empirical analysis.[9]

• One could also try to explain the Zazaki data by postulating that indexicals are De Se pronouns with special conditions of use. But the generalization discussed by Anand & Nevins concerns all indexicals (including temporal and locative adverbials), not just pronouns. This makes it very unlikely that we are just dealing with cases of accidental homophony between De Se pronouns and indexicals.

For completeness, it should be mentioned that Anand & Nevins (2004) and Anand (2006) argue that some language have 'partial diagonalization operators' which are selected by certain verbs but not by others. Their suggestion is that some operators only manipulate 'part' of a context, leaving the other coordinates fixed; Anand's typology is shown in (59) (excluding his study of Chinese *zìjí*, which displays a more complex behavior). An alternative possibility to analyze these examples is to posit a more powerful system of quantification over contexts, with rich lexical entries which specify which indexical can depend on which

[9] In a nutshell, Anand 2006 argues that if Rojda says: 'Hesen is rich', and it is known that Hesen is Rojda's brother, it is permissible in Zazaki to report the claim with what is literally: *Rojda said that my brother is rich*. By contrast, partial quotation in English is much more degraded in this scenario than in a situation in which Rojda literally said: 'My brother is rich'. In Anand's terms, partial quotation must obey a constraint of 'faithful reporting' from which indirect discourse (be it 'monstrous' or not) is entirely free.

context variables; as we will now see, there might be other reasons to posit such a powerful system.

(59) Typology of monstrous operators (Anand 2006)

Cross-linguistic variation

	VERB	LEXICAL ENTRIES	CLASS DESCRIPTION
AMHARIC, AGHEM	SAY	[say (OP_{per})]	optionally shifts 1st/2nd-per indexicals
NAVAJO	SAY	[say (OP_{per})]	optionally shifts 1st/2nd-per indexicals
SLAVE	TELL	[tell (OP_{per})]	optionally shifts 1st/2nd indexicals
	WANT	[want (OP_{auth})]	optionally shifts 1st-per indexicals
	SAY	[say OP_{auth}]	obligatorily shifts 1st-per indexicals
ZAZAKI	SAY	[say ($OP_{\forall}$)]	optionally shifts all indexicals
ENGLISH	ALL	[att-verb]	no indexical shift

3.2 Quantificational Monsters: Quantifiers over Contexts

3.2.1 Motivations

Some researchers have argued that natural language (also) has monstrous operators that are less directly Kaplanian, in that they are not *modal operators* that manipulate a context *parameters*, but rather *quantifiers* that bind a context *variable*. In fact, the quantificational analysis was discussed in the literature before Anand & Nevins discovered their remarkable data. There were several reasons for this alternative treatment context shifting.

(i) First, natural language does not generally appear to have temporal or modal operators, which manipulate a parameter and give rise to the kind of 'memory loss' we discussed above, but rather temporal and modal quantifiers, which *allow* expressions in their scope to depend on them but do not *force* them to do so. As was announced in Section 1.1.1, when the full range of data is considered, they suggest that a semantics which has the full power of explicit quantification over times and worlds as well as individuals is needed to deal with temporal and modal talk in natural language (see Cressweel 1990 for a thorough discussion). Early research on shifted indexicals thus started from the assumption that, *if* context shifting is at all allowed in natural language, it too should proceed by way of quantification of context variables. Anand & Nevins's data suggest that this assumption was incorrect for Zazaki, since their own monsters display a perfectly standard modal (rather than quantificational) behavior.

(ii) Still, it could be that *other* monsters are of the quantificational rather than of the modal variety. The debate is still rather open, but some examples are worth discussing.

• Preliminary data from Amharic were discussed in Schlenker (2003) (see also Anderson & Keenan 1985 for earlier data). First, it was observed that Amharic first and second person markers may denote a non-speaker or a non-hearer when embedded under an all-purpose attitude verb (whose original meaning is 'say'), but not in relative clauses. Second, extraction tests were applied to show that the appearance of shifting is not a consequence of quotation. Third, it was shown in Anand (2006) that a shifted first person pronoun in Amharic may only be read De Se, as is expected if it is a shiftable indexical. Fourth, it was observed in Schlenker (2003) that two occurrences of a first person feature that occur in the same embedded environment may be evaluated with respect to different contexts, which suggests that *Shift together* fails to hold.

(60) Amharic 1st person pronouns (apparently) fail to obey Shift Together (Anand 2006)

John lij-e ay-ittazzəzəññ alə
John son-my NEG.3s-obey.mkimperf-1sO say.PERF.3sm
Johni said, "my son will not obey AUTH(c)." '
'Johni said, "AUTH(c)'s son will not obey me."

Anand (2006) confirms these data for about half of his Amharic informants, but he argues that they are best analyzed by positing an ambiguity: the Amharic first person marker may behave as an unshiftable indexical, or as a logophoric element, which according to Anand falls under a different generalization. Furthermore, he suggests that second person markers do *not* display this pattern and obey his 'Shift Together' constraint:

(61) Amharic 2nd person pronouns obey Shift Together (Anand 2006)
John Bill lij-ih ay-ittazzəzə-ih alə-w
John Bill son-your NEG.3s-obey.mkimperf-2smO-NEG say.PERF.3sm-3smO
'John$_i$ say to Bill$_j$, "your$_j$ son will not obey you$_j$." '
'John$_i$ said to Bill$_j$, "ADDR(c)'s son will not obey ADDR(c)." '
'*John$_i$ said to Bill$_j$, "ADDR(c)'s son will not obey you." '
'*John$_i$ said to Bill$_j$, "your son will not obey ADDR(c)." '

• The Russian present tense is sometimes claimed to be a shiftable indexical (Schlenker 2003; see Kondrashova 1998 for a different view). It does have some of the desired properties: it may denote a non-present moment in attitude reports, but in general it may not in relative clauses, or for that matter in other complement clauses that are not themselves in an intensional construction (on the other hand, like the English present tense it may denote a non-present moment when it is in the scope of a future operator, as in: *In 20 years, little Johnny will marry a woman who loves him*).

(62) The Russian present tense is monster-like
a. Shifting is possible under attitude verbs
petja$_i$ skazal, čto on$_i$ plačet [Russian]
Pejta$_i$ said that he$_i$ is-crying
'Petja said that he was crying [at the time of his utterance]'
b. Shifting is not possible in relative clauses
petja$_i$ vstretil čeloveka, kotoryj plačet. [Russian]
Pejta met person, who is-crying
'Petja met a person who is crying/cries.'
NOT: 'Petja met a person who was crying [at the time of the meeting].'
c. Shifting is not possible under *it happened that* (cf. Jansen et al. 1986)
často slučalos', čto miša plakal / *plačet
*often happened that Misha cried / *is-crying*
'It often happened that Misha cried' (not: 'cries')

Crucially, when a first person pronoun co-occurs with a shifted present tense, it is still taken to denote the actual speaker (rather than the agent of the report), which shows that Russian violates *Shift Together*. Furthermore, the present tense of a relative clause embedded under a clause whose tense is itself shifted may still be 'unshifted', and thus denote the time of utterance - as shown in (1); this suggests that Russian also violates *No Intervening Binder*.

(v 1980 godu petja sprosil menja, rabotaet li na KGB čelovek, kotoryj pravit stranoj
in 1980 year Petja asked me works whether on KGB person who rules country
'In 1980, Petja asked me whether the person who is <now> ruling the country works for the KGB'

• Schlenker (2003) also mentions the behavior of French *dans deux jours* (*in two days), which he claims to display the characteristic behavior of a shiftable in*dexical. Importantly, *dans deux jours* contrasts with *après-demain*, which behaves like a well-behaved Kaplanian

(unshiftable) indexical. Schlenker extends the analysis to English *two days ago* vs. *the day before yesterday*, but these data have been debated, and might be incorrect or subject to important cross-individual variation:

(64) My brother has informed me repeatedly over the years that my mother had asked the night before where I had been two days ago.

Assuming that *the night before* is evaluated with respect to my brother's speech act, it was claimed in Schlenker (2003) that there are two readings for 'two days ago': it may be evaluated with respect to the time either of my mother's or of my brother's speech act.

• Abusch (1997) discusses the case of *might* and *ought* in English, which closely mirror the behavior of Russian present tense verbs: their time of evaluation may be a non-actual context, but only in case they are in the scope of an attitude operator or of a present tense (the latter fact does not follow from a theory of indexicality).

(65) a. When he was 15, John was in love with a girl who ought to study more.
=> the girl John was in love with ought to study more now.
b. John thought that his girlfriend ought to study more / thought that his girlfriend was someone who ought to study more.
≠> John's girlfriend ought to study more now.

It is clear that when other indexicals occur in the same clause as *might* or *ought*, the former fail to shift even when the latter do; here too *Shift Together* is violated. Furthermore, even when two occurrences of *ought* are embedded under the same attitude verb, they may be evaluated with respect to different contexts; thus in (66), *ought to be expelled* is shifted, but *ought to be prosecuted* can still be interpreted with respect to the time of utterance.

(66) In 1980, John asked whether the person who ought to be prosecuted for Politkovskaja's murder knew someone who ought to be expelled from the Central Committee.

• It should be added that Anand (2006) mentions examples from Slave (Rice 1986) and Catalan Sign Language (Quer 2005) which suggest that *Shift Together* might be too strong for these languages as well.

• Expressives - for instance ethnic slurs - indicate that a given agent has a (typically negative) attitude towards someone or something. Thus the term *honky* indicates that the agent has a negative attitude towards white people. Whether this is semantically an assertion, a presupposition, or a conventional implicature is a question we will not go into here (see Potts 2007 and commentaries for a survey of the debate). What matters for our purposes is that at least some expressives can be understood with a shifted reading, whereby it is the agent of a reported thought act who is supposed to hold the relevant attitude:

(67) a. #I am not prejudiced against Caucasians. But if I were, you would be the worst honky I know.
b. I am not prejudiced against Caucasians. But John, who is, thinks/claims that you are the worst honky he knows. (Schlenker 2003, Potts 2007)

Interestingly, *honky* and similar terms fail to obey Shift Together:

(68) I am not prejudiced against Caucasians. But Pierre, who is, has repeatedly made the claim that you are the worst honky that the frog's mother knows.

It appears to be possible to interpret *honky* from Pierre's standpoint but *frog* from the speaker's perspective, which suggests that expressives violate Shift Together (it can also be noted that the *that*-clause is embedded in a syntactic island - the complex Noun Phrase *[the claim that ...* - which makes it unlikely that any kind of covert movement of one of the expressives out of the scope of the attitude operator could be responsible for the mixed reading we observe). (See Harris and Potts 2009 for a different view on related data.)

3.2.2 Solution Strategies

What should be done if some of these examples turn out not to involve an accidental ambiguity between indexicals and logophoric elements (as noted above, Anand 2006 posits such an ambiguity in Amharic)? The simplest solution is probably to take these sentences to involve an abstractor over contexts represented at the top of the embedded clause. For simplicity, we take the complementizer itself to be the λ-operator, though this is just for notational convenience. We henceforth work within a purely extensional system, with object-language variables over individuals, times, worlds, and contexts; an assignment function is thus supposed to provide a value of the right type for all three categories of variables (we have introduced a type c for *contexts*, hence the notation c_c, which indicates that the meta-linguistic variable *c'* has type c)

(69) $[\![\text{that}_{c_i}\ F]\!]^{c,s} = \lambda c'_c\ \ [\![F]\!]^{c,s[c_i \rightarrow c']}$

There may also be 'standard' complementizers, which only abstract over times and possible worlds; we analyze them with the following syntax and semantics (here t_i indicates that *t* is a meta-linguistic variable denoting times, of type i; while w_l indicates that *w* is a meta-linguistic variable denoting worlds, of type s):

(70) $[\![\text{that}_{t_k, w_l}\ F]\!]^{c,s} = \lambda t_i\ \lambda w_s\ [\![F]\!]^{c,s[t_k \rightarrow t, w_l \rightarrow w]}$

In fact, we can generalize this procedure to allow for simultaneous abstraction over individuals, time and worlds; this leads to a near-notational variant of (69):

(71) $[\![\text{that}_{x_i, t_k, w_l}\ F]\!]^{c,s} = \lambda x'_e\ \lambda t'_i\ \lambda w'_s\ [\![F]\!]^{c,s[x_i \rightarrow x', t_k \rightarrow t', w_l \rightarrow w']}$

In principle we do not quite get the same model-theoretic objects with (71) and (69), even if we treat contexts as triples of an individual, a time and a world. This is because, as was noted at the outset, contexts are usually taken to satisfy some non-trivial semantic constraints: not just any tuple of the right type can be called a 'context'; but in the definition in (71) we obtain, in effect, a function that takes *any* triple of the right kind and outputs a truth value. By itself this need not be a crucial difference: the semantics of attitude verbs can be adapted to neutralize it (in the contexts-as-triples approach, just take attitude verbs to quantify over *those triples that are possible contexts*). The main difference between the two approaches is syntactic and morphological: the definition in (69) makes it clear that the dependency involves contexts; the definition in (71) doesn't. Proponents of the latter approach (e.g. Schlenker 1999 and von Stechow 2002, 2003) are thus forced to enrich this definition with diacritics on variables to indicate that they are not 'normal' variables – which is essential in order to derive the morphological idiosyncracies of variables which are dependent on attitude verbs; we come back to this point below.

Our 'old' lexical entries for attitude verbs can be retained in the extensional analysis. We must just ensure that the time and world arguments that appear in the embedded clause appear in the 'right' syntactic position to be compatible with the semantic type of the verb. Finally, in order to allow for expressions that depend on the actual context, we introduce a distinguished variable *c**, with the following assumption (to be slightly revised below):

(72) Assumption about context variables (preliminary version)
a. *c** is a free variable that always denotes the context of the actual speech act.
b. No other context variable can be free.

This analysis makes it possible to represent a variety of readings; for simplicity, I assume that *two days ago* does allow for these readings (the reader may replace mentally with the corresponding French sentence with *dans deux jours*).

(73) John said that Mary left two days ago.
a. Reading 1 ('shifted' reading for *two days ago*)
c^*_w t_k John say that$_{c_i}$ c_{iw} two-days-ago-c_i Mary leave
In words: every context c_i compatible with what John says at time t_k in the world of c* satisfies: Mary leave two days before the time of c_i in the world of c_i
b. Reading 2 ('non-shifted' reading for *two days ago*)
c^*_w t_k John say that$_{c_i}$ c_{iw} two-days-ago-c* Mary leave
In words: every context c_i compatible with what John says at time t_k in the world of c* satisfies: Mary leave two days before the time of c* in the world of c_i

To interpret these structures, we assume that c^*_w, c^*_t denote the world and time coordinates of *c**, and that *two-days-ago-c_i* denotes the time which is two days before the time of c_i:

(74) For any context-denoting expression *c'*,
a. $[\![c'_a]\!]^{c,s}$ = the agent of $[\![c']\!]^{c,s}$; $[\![c'_t]\!]^{c,s}$ = the time of $[\![c']\!]^{c,s}$; $[\![c'_w]\!]^{c,s}$ = the world of $[\![c']\!]^{c,s}$.
b. $[\![$ two-days-ago-c' $]\!]^{c,s}$ = the time which is two days before the time of of $[\![c']\!]^{c,s}$

With these lexical rules, the reader can check that we obtain the desired readings.

But this analysis raises a question: how can we guarantee that *yesterday* cannot be shifted? In other words, how can the present framework draw a distinction between unshiftable and shiftable indexicals? A simple solution is to introduce a feature ±c*: an indexical expression which carries the feature +c* must take as argument the distinguished variable *c**, which denotes the context of utterance; an indexical expression which is unspecified for ±c* can take as argument any context variable it desires. So *yesterday* is stipulated to carry the feature +c*, whereas *two days ago* is left unspecified. In similar fashion, we can account for the difference between English *I* and Amharic *I* - call it I_{Amh} - by positing that the former is specified for +c*, while the latter is unspecified, which allows it to be used with a shifted reading:

(75) John says that I be-a-hero
c^*_w t_k John say that$_{c_i}$ c_{iw} c_{it} I_{Amh}-c_i be-a-hero

It should be noted that this analysis can also account for the De Se reading of PRO *if* we stipulate by brute force that PRO spells out something like c_{ia} (with appropriate syntactic constraints to guarantee that c_i is bound locally).

An important argument for this typology is that in one and the same language some indexicals are shiftable while others are not. I refer the reader to the literature for some such examples (e.g. Schlenker 1999, 2003; Anand 2006). The difficulty, however, is that the standard version of this approach (in which *c** is always a free variable) approach fails to do justice to the generalizations uncovered by Anand & Nevins, since it predicts that *Shift*

Together and *No Intervening Binder* should always *fail* to hold. What we need is a more nuanced analysis, which allows for the possibility of both types of cases: some attitude verbs should behave, *à la* Anand & Nevins, like modal context-shifters, while others should probably be treated as quantifiers over contexts.

There is a solution, which was suggested by Ede Zimmermann (p.c.): one may simply postulate that the diagonal operator in Zazaki is in fact a lambda-operator that binds the distinguished variable *c**:

(76) $[\![\delta_{c^*} F]\!]^{c,s} = \lambda c'_c \; [\![F]\!]^{c,s[c^* \rightarrow c']}$

Zimmermann's suggestion requires a small modification of our assumption about context variables stated in (72): we must now allow the variable *c** to be bound, but only by the operator δ_{c^*}.

We can now derive Anand & Nevins's data if we assume that (a) all Zazaki indexicals are specified for the feature +c*, and that (b) *vano* ('say') can optionally embed δ_{c^*}. In such cases, δ_{c^*} will by force shift the point of evaluation of all the indexicals that are in its scope; and since all indexicals must take *c** as their argument, whenever one indexical shifts in a given clause, all other indexicals must shift as well. In this analysis, then, Zazaki is just like English, except that *vano* ('say') can embed the special diagonal operator δ_{c^*}.

As things stand, then, it seems that we need both the context abstractor $that_{c_i}$ in (69), which can bind any context variable c_i; for Zazaki, we must also postulate the existence of δ_{c^*} in (76), which will emulate within an extensional system the behavior of a modal context-shifter. And of course we will need $that_{t_k, w_l}$ in (70) for those intensional verbs which are not attitudinal. Can we stop here? If we did, we would predict that *every attitude verb that gives rise to De Se readings can in principle shift the context of evaluation of (some) indexicals*. However this claim might conceivably to be too strong: in Amharic, it appears that only one all-purpose attitude verb can shift the context of evaluation of indexicals. It could be that all other attitude verbs fail to give rise to De Se readings. But if not, we might need a more nuanced approach, which *also* makes use of the complementizer $that_{x_i, t_k, w_l}$ in (71), which simultaneously binds three variables. Depending on whether an attitude verb selects $that_{x_i, t_k, w_l}$, $that_{c_i}$ or δ_{c^*}, different cases will arise.

- An attitude verb that selects $that_{x_i, t_k, w_l}$ will give rise to De Se readings (due to the simultaneous abstraction over individuals, times and worlds), but it will not shift the context of any indexical;
- $that_{c_i}$ will shift the context of evaluation of those indexicals that do not carry the feature +c* (since those can only take as argument the designated context variable *c**, which cannot be bound by $that_{c_i}$);
- in Zazaki, *vano* ('say') can embed $\delta_{c^*} that_{c^*}$, which obligatorily shifts the context of evaluation of all indexicals that have the feature +c*.

Yet another possibility would be to *only* posit some versions of the complementizer $that_{x_i, t_k, w_l}$, but to add to it a system of diacritics on the variables (together with an appropriate system of feature transmission) to constrain the interpretive possibilities of various indexicals, which could now be treated as bound variables of a particular kind (see Heim 2005, 2007 and Stechow 2002, 2003 for a system of this kind). The choice among these analytical possibilities is still open, but Anand (2006) provides an in-depth discussion of their empirical consequences.

4. Logophoric Pronouns

We saw above that a feature ±c* is useful to distinguish between shiftable and unshiftable indexicals: the latter carry the feature +c*, while the former are unspecified for it. This leads one to expect that there should be -c* expressions as well; these would be obligatorily shifted indexicals, i.e. expressions with a distinguished morphology which can only be read De Se.

Such pronouns have been described in a variety of languages, notably Ewe, studied in Clements (1975), and Gokana, discussed in Hyman and Comrie (1981) (see also Hagège 1974[10], and von Roncador 1988). Summarizing cross-linguistic data, Clements characterized logophoric pronouns as elements that satisfy conditions (i)-(iii) (Clements 1975 p. 171):

> (i) logophoric pronouns are restricted to *reportive contexts* transmitting the words or thought of an individual or individuals other than the speaker or narrator;
> (ii) the antecedent does not occur in the same reportive context as the logophoric pronoun;
> (iii) the antecedent designates the individual or individuals whose words or thoughts are transmitted in the reportive context in which the logophoric pronoun occurs.

It is interesting that this description was written before the De Se debate touched linguistics. Strikingly, this behavior corresponds exactly to what one would expect from expressions that are lexically specified to be De Se pronouns. But the history of the term 'logophoric' developed somewhat differently.

• Historically, logophoricity gained prominence in the linguistic (and especially syntactic) literature before the issue of De Se readings entered semantics. Specifically, Sells (1987) studied logophoricity in terms of three primitive notions: the *source*, which is the 'intentional agent of communication'; the *self*, whose mental state the proposition describes; and the *pivot*, which is the physical center of deixis. Sells wrote:

> I will propose that there is no unified notion of logophoricity and that instead there are three more primitive "roles" in discourse: the SOURCE, the SELF, and the PIVOT. The SOURCE is the one who makes the report (for example, the speaker). The SELF represents the one whose "mind" is being reported: the PIVOT represents the one from whose point of view the report is made." As will become clear, I understand PIVOT in a very physical sense as the "center of deixis' (...) if someone makes a report with Mary as the PIVOT, that person is understood as (literally) standing in Mary's shoes. These roles define different discourse environments, depending on the specification of each-namely, whether each role is predicated of a sentence-internal referent or of the external speaker. The basic idea of the analysis is that "logophoric" pronouns will link to some NP *in virtue of the fact that it is associated with a particular role;* such information about roles will be represented in the discourse structure. (Sells 1987; 455-456)

[10] A similar topic was investigated in Hagège 1974, which gave 'logophoric' pronouns their name (literally, these are 'pronouns that carry discourse'). Since Clements's study is considerably more detailed and displays a high level of analytical clarity, it is the one we discuss in what follows.

Each of these roles could in principle be predicated of the speaker, or of a sentence-internal referent. Different verbs behave differently with respect to these notions: for instance, in *x says that p*, *x* simultaneously carries the roles of source, self and pivot; in *x was distressed that p*, which does not involve a speech act verb, the source is the actual speaker, while the self and the pivot were taken to be *x*; and in *Max was reading when Maria came to visit him*, which is not an attitude report, *Max* might be the pivot of the sentence, while the actual speaker carries the roles of source and self. Thus Sells's typology is more fine-grained than the one that comes out of the De Se analysis; but it is also less worked out semantically, since it does not include any model-theoretic interpretation (though Sells does provide logical forms within Discourse Representation Theory). In essence, Sells went on to suggest that logophoric pronouns depend on the source, while other expressions may have different specifications. It is likely that future work will seek to combine this level of fine-grainedness with the more precise semantic analyses that were developed later.

• The term 'logophoricity' is sometimes extended to a variety of cases in which a pronoun - especially an emphatic or reflexive one - is used to refer to a person whose thoughts are particularly salient, even in the absence of an attitude verb (e.g. Reinhart & Reuland 1993). Some confusion can result if the same term is applied to phenomena that are rather different in nature; he we will stick to Clements's characterization.

Several arise in the study of logophoric pronouns in the strict sense.

(i) First, are they obligatorily read De Se? The literature suggests that this is so, but in fairness the fine-grained semantic work needed to establish this has only been done by few (see Anand 2006 for data).

(ii) Second, are there only author-denoting logophoric pronouns, or also hearer-denoting logophoric pronouns? Mupun (Frayzingier 1985, 1993) appears to have some hearer-denoting logophoric pronouns, but the data are complex and would require closer analysis.

(iii) Third, are there locality and/or intervention effects on the licensing of logophoric pronouns? Here the answer appears to depend on the language. Clements (1975) as well as Hyman and Comrie (1981) imply that no such effects exist in Ewe and Gokana; on the other hand, Anand (2006), following Adesola (2005), claims that such effects exist in Yoruba, which he assimilates to the De Re blocking effect we saw at work in Section 2.2.4.

(iv) Fourth, do logophoric pronouns exist in all persons? In general, first person logophoric pronouns appear to be rare or non-existent; but there might be pragmatic constraints that explain this fact (see Schlenker 2003 and Anand 2006 for discussion). Gokana is in this respect of particular interest, because the logophoric marker does not appear on the pronoun but rather as a suffix on the verb, and it seems to be available in all persons - though it is obligatory in the third person, optional in the second person, and 'dispreferred' in the first person (interestingly, the logophoric marker appears on the verb when the subject, object or even a possessor is logophoric).

(v) What happens with plural logophoric pronouns? Clements (1975), Hyman & Comrie (1981), and Frajzyngier (1993) note that the logophoric markers of Ewe, Gokana and Mupun display an interesting pattern in which logophoric marking can or must be obtained as soon as a plural pronoun overlaps in reference with the agent of the thought- or speech-act which is reported. The connection between indexicality and logophoricity makes this pattern relatively

unsurprising: as is relatively uncontroversial, first person plural pronouns carry first person features even though they often denote a group that only overlaps in reference with the speaker (this pattern is particular clear in Mandarin, where *wo^{3}men* is morphologically composed of the first person pronoun and a plural marker).

(vi) Do non-logophoric forms give rise to disjoint reference effects when a logophoric form could be used with a co-referential interpretation? The traditional view is that disjoint reference effects are indeed obtained, as is illustrated in (77):

(77) a. kofi be yè-dzo (Ewe, Clements 1975)
Kofi say LOG-leave
'Kofi says that he (=Kofi) left'

b. kofi be e-dzo (Ewe, Clements 1975)
Kofi say he/she-left
'Kofi says that he (≠ Kofi) left'

Most contemporary accounts, however, predict a more subtle pattern: disjoint reference effects should hold *only* on the De Se reading; the non-logophoric pronoun should thus be free to give rise to coreferential readings in non-De Se contexts (see Anand 2006 for discussion).

(vii) Is a special complementizer needed to license logophoric pronouns? Here the answer appears to depend on the language. In Ewe, Clements suggests that logophoric pronouns are only allowed when a special complementizer (*be*), which etymologically means *say*, is present. In Gokana, logophoric pronouns are always acceptable when a special complementizer, which also means 'say', is used; but sometimes logophoric pronouns are also acceptable in its absence, as in indirect questions.

(viii) Do logophoric pronouns have to be syntactically embedded under an overt attitude verb? Data discussed by Clements (1975) suggest that this is not so, and that long discourses can contain logophoric pronouns without any overt embedding; but in such cases, Clements's descriptions suggest that they are understood as instances of modal subordination, whereby a thought is presented as being reported despite the absence of an attitude operator:

> The antecedent of the logophoric pronoun in Ewe need not occur in the same sentence, but may occur several sentences earlier. In such cases (...) the subsequent sentences of the discourse will continue to present the events described by the narrator from the point of view of the same individual or individuals. (Clements 1975: 170)

5. De Se Readings and Logophoric Expressions in Other Domains

5.1.1 World Logophors?

Since Partee (1973) it has become common to treat tense in anaphoric terms; the same approach has sometimes extended to mood (Stone 1997). This might lead one to expect that there might exist logophoric tenses and moods. No clear case of logophoric tense appears to be known. But it has been argued that some moods are indeed logophoric. This in particular the case of the German "Konjunktiv I", a subjunctive which is basically restricted to attitude reports:

(78)	Der Peter	meint,	a.	es	sei später, als es tatsächlich	ist
	the Peter	*thinks*		*it*	*be later than it really*	*is*
			b.	es	ist später, als es tatsächlich	ist
				it	*is later than it really*	*is*
			c.	* es	sei später, als es tatsächlich	sei
				it	*be later than it really*	*be*
			d.	* es	is später, als es tatsächlich	sei
				it	*be later than it really*	*be*

Although the German indicative (glossed as 'is') may be interpreted either inside or outside the scope of an attitude verb, the latter possibility is precluded for the 'Konjunktiv I' (glossed as 'be'). This directly accounts for the ungrammaticality of (78). Sometimes the attitude operator need not be overt, as in (79):

(79) a. Er sagte, sie sei schön. Sie habe grüne Augen. (Jäger 1971)
He said she be pretty. She have green eyes.
b. Er sagte, sie sei schön. Sie hat grüne Augen. (Jäger 1971)
He said, she be pretty. She has green eyes

As Jäger (1971) observes, in (79), which involves a Konjunktiv I form of *have*, the second sentence must be read from the standpoint of the attitude holder, so that it is interpreted as: 'He says/thinks that she has green eyes'. No such reading is forced in (78). This effect is rather strikingly reminiscent of the one found in Ewe under similar circumstances, as was discussed in (viii) above.

There are interesting - and ill-understood - semantic constraints on logophoric pronouns and the Konjunktiv I. As mentioned, logophoric pronouns almost never occur in the first person; and the Konjunktiv I does not usually occur in the first person present. Schlenker (2003) gives a unified semantic/pragmatic explanation of these phenomena, but an alternative - and empirically deeper - analysis has been offered by Fabricius-Hanse & Saebø (2004) for the Konjunktiv I. These analyses should be compared to broader analyses of *evidentials*, which have sometimes been analyzed in terms of context shift; see Sauerland & Schenner (2007) for a very fine-grained discussion of Bulgarian evidentials from this broader perspective.

5.1.2 Event De Se?

So far we have entirely disregarded event semantics. But Higginbotham (2003) suggested that infinitives are not just De Se with respect to their individual argument (*PRO*), but also with respect to their event argument. Here are some of the contrasts he discussed (they are in the first person but would work just as well in the third person; Portner 1992 offers further facts and a different theoretical perspective):

(80) a. I remember walking to school in the 5th grade.
b. I remember that I walked to school in the 5th grade.

Most adults are in a position to utter (80) truly, but very few have such a good memory that they could assert (80), which requires that one actually remembers the event of walking rather than the general fact that one did walk in the past.

For present purposes, we can account for the distinction by replacing time arguments with event arguments - which are presumably more fine-grained: to every event there corresponds a time (the time of that event), but distinct events may occur at the same time. This move must of course be made consistently - the lexical semantics of expressions (e.g. verbs) that take must be revised to replace the time argument with an event argument. With

this framework in place, the only thing to observe is that the infinitive is read De Se not just with respect to its individual argument, but also with respect to its event argument. By contrast, a full clause need not be read De Se with respect to either (though it may be multiply ambiguous; as in the case of *he*, the issue of the De Re / De Se ambiguity for elements that are already known to have a De Re reading is quite complex). To make things concrete, we give in (81) a revised semantics for the complementizer, treated as a simultaneous λ-abstractor over individuals, events and possible worlds (it is identical to our earlier 'De Se' complementizer, except that abstraction over times is replaced with abstraction over events):

(81) $[\![\text{that}_{x_i, e_k, w_l} F]\!]^{c,s} = \lambda x'_e \ \lambda e'_i \ \lambda w'_s \ [\![F]\!]^{c, s[x_i \rightarrow x', e_k \rightarrow e', w_l \rightarrow w']}$

We can now represent the Logical Forms of (80) by positing an unpronounced De Se complementizer in the first case:

(82) a. w* e* I remember ~~that~~$_{x_i, e_k, w_l}$ w_l e_k PRO_i walking to school
b. w* e* I remember that$_{x_i, e_k, w_l}$ [∃e_m: $e_m \approx e_k$] w_l e_m I walking to school

Here $e_m \approx e_k$ indicates that the events e_m and e_k occured at the same time; and it is assumed for ease of comparison that the embedded occurrence of *I* in the tensed complement has a De Se interpretation. It is then clear that (82) is read De Se with respect to its event argument, whereas (82) isn't - despite the fact that both are read De Se with respect to their subject argument. Of course an analysis of the infinitive would have to explain why in attitude reports its event argument must be bound by the closest λ-abstractor; but this question already arose - and was left open - with respect to PRO.

Related contrasts can be found in French:

(83) a. J'ai l'impression de greloter
I have the impression to shiver
b. J'ai l'impression que je grelotte
I have the impression that I shiver

In a situation in which I see myself in a mirror, realize that this is me, and get the impression that the person I see is shivering, it is possible to use the full complement, as in (83), but it is far less natural to use the infinitive, as in (83). No such contrast obtains if I have an internal feeling of shivering (if anything, the infinitive is more natural in this case). Importantly, the fact that *PRO* is read De Se is unlikely explain this contrast: in both cases, I have full knowledge of the identity of the person under discussion. Rather, we appear to obtain a De Se / De Re contrast, not with respect to the individual argument of the verb, but with respect to its event argument.

6. Bicontextualism

In the foregoing discussion, we have assumed that there was a single notion of 'context'. In Kaplanian theories, the interpretation function literally takes just one context parameter as argument; this also holds of monstrous versions of Kaplan's modal semantics. In theories that countenance quantification over contexts, things are a bit more complex: a sentence may be evaluated with respect to an assignment function that assigns different denotations to different context variables. Still, these various contexts do not come with distinct roles; they are all contexts of speech or of thought. In recent research, however, it has been argued that even unembedded sentences must be evaluated with respect to two distinct types of context. Two separate phenomena have led researchers to this conclusion (within very different

theoretical frameworks): Free Indirect Discourse on the one hand, and epistemic modals and predicates of taste on the other. Since nobody claims that these phenomena should be unified, if we accept the conclusions of each line of investigation we will have to conclude that every sentence is evaluated with respect to at least three different sorts of context. We won't take a position on this issue, but will briefly sketch each line of argument.

6.1 Free Indirect Discourse

Free Indirect Discourse is a type of reported speech, found primarily in literature, in which different indexicals are evaluated with respect to different contexts, *even in the absence of any (overt) attitude operator:*

(84) a. Tomorrow was Monday, Monday, the beginning of another school week! (Lawrence, *Women in Love*; cited in Banfield 1982)
b. #He thought: 'Tomorrow was Monday, Monday, the beginning of another school week!'
c. #He thought that tomorrow was Monday, Monday, the beginning of another school week!

(85) Where was he this morning, for instance? Some committee, she never asked what (Woolf, *Mrs Dalloway*; cited in Banfield 1982)

The thought expressed in (84) and (85) is attributed to the character whose attitude is described rather than to the narrator; it can optionally be followed by a post-posed parenthetical, such as ', he thought' or ', he said'. Descriptively, Free Indirect Discourse behaves as a mix of direct and of indirect discourse: tenses and pronouns take the form that they would have in an attitude report (e.g. *She wondered where <u>he</u> <u>was</u> that morning*), while everything else -including *here, now, today, yesterday* and the demonstratives (e.g. *this*)- behaves as in direct discourse. In other words, a passage in Free Indirect Discourse may be obtained by changing the person and tense markers of a quotation to those of an indirect discourse embedded under an attitude verb in the desired person and tense. Importantly, the indexicals that 'shift' in Free Indirect Discourse in English do not do so in standard indirect discourse (though it may well be that indexicals that shift in standard indirect discourse must do so in Free Indirect Discourse, as is discussed below). This fact alone shows that shifting in Free Indirect Discourse is not entirely reducible to the issues we discussed earlier.

There are two general lines of analysis of Free Indirect Discourse: it may be seen as a special form of direct discourse, with no attitude operator; or as a special form of indirect discourse, with a concealed and non-standard attitude operator. The puzzle, which is laid out in great detail in Sharvit (2008), is that *Free Indirect Discourse has properties of both direct and indirect discourse*.

Let us start with the properties that Free Indirect Discourse shares with direct discourse. First, as seen in (84)-(85), indexicals other than tense and person behave as in direct discourse. Second, clauses in Free Indirect Discourse behave syntactically as if they were (as they seem to be) *un*embedded. Banfield (1982) (Section 2.1) lists an impressive array of arguments for this conclusion. In particular, she observes that a passage in Free Indirect Discourse is never preceded by a complementizer (e.g. **That he would marry Ann tomorrow, John thought a week ago*); that all sorts of elements that can never occur in embedded clauses can still appear in Free Indirect Discourse (for instance *Oh, he was tired, John said* is a possible Free Indirect Discourse; by contrast, *John said that oh he was tired* is ungrammatical; similarly the repetition of *Monday* in (84) would be impossible in an indirect

discourse). Third, direct questions are entirely natural in Free Indirect Discourse, but unacceptable in embedded clauses:

(86) a. Why was John so happy today? (Mary wondered)
b. #Mary wondered why was John so happy today?

Fourth, a sentence in Free Indirect Discourse does not allow for any De Dicto/De Re ambiguity, unlike a clause embedded under an attitude operator, as illustrated in the following contrast due to Reinhart (1983):

(87) a. Oedipus believed that his mother wasn't his mother.
b. #His mother was not his mother, Oedipus believed.

Fifth, Free Indirect Discourse is much more faithful to the *words* used in the thought which is reported than De Dicto indirect discourse is. *John thought that Peter or Sam would come* is equivalent to: *John thought that Sam or Peter would come*, with the order of the disjuncts reversed; and no speaker would have any difficulty accepting both sentences as true descriptions of one and the same event. But from: *Tomorrow Peter or Sam would come, Ann thought* it seems much harder to infer: *Tomorrow Sam or Peter would come, Ann thought*. Somehow one gets the sense that at most one of these sentences should be true of a given thought act, exactly as with quotations: if *Ann said: 'Tomorrow Sam or Peter will come'*, it can't also be true of the same event that *Ann said: 'Tomorrow Peter or Sam will come'* (of course one often doesn't care whether Ann said one or the other, but this is a different issue).

The properties that Free Indirect Discourse shares with standard indirect discourse concern the behavior of pronouns and tense. First, in simple cases tense and pronouns are evaluated 'from the perspective of the speaker' (rather than from the perspective of the agent of the thought, as would be the case in direct discourse). Second, Sharvit (2003) claims on the basis of Hebrew data that *those indexicals that shift in Standard Indirect Discourse also shift in Free Indirect Discourse* (her argument, which would need to be extended to other languages, is that the Hebrew present tense shifts in both environments). Further similarities between Free Indirect Discourse and Standard Indirect Discourse are discussed in Sharvit (2008).

Turning to the analyses, there are - unsurprisingly - two main lines: one emphasizes the similarities with direct discourse, and the other one with standard indirect discourse.

Several researchers have taken Free Indirect Discourse to be an instance of direct discourse which is evaluated with respect to two different contexts at the same time (Banfield 1982 Doron 1991, Schlenker 2004). One possible theory (Schlenker 2004) starts from a conceptual distinction between two notions of context. The *Context of Thought* is the point at which a thought originates; it includes a thinker, a time of thought and a world of thought (in some cases a thought might also have an intended addressee, especially if it corresponds to a speech act). The *Context of Utterance* is the point at which the thought is expressed; it includes a speaker, a hearer, a time of utterance and a world of utterance. Grammatically, (a) tenses and pronouns depend on the Context of Utterance (henceforth called υ), while (b) all other indexicals (including the demonstratives, as well as *here*, *now*, and *yesterday*) depend on the Context of Thought (henceforth called θ). For obvious reasons, the difference rarely matters in everyday life (usually, the point at which a thought is formed is not significantly different from that at which it is expressed). But in literature, a narrator may write *as if* the Context of Thought θ or the Context of Utterance υ (or both) may be taken to be distinct from the physical point at which the narrator's words are expressed. In particular, in Free Indirect Discourse the Context of Utterance is set to the actual context, but the Context of Thought is taken to be located somewhere else (thus $c = \upsilon$ and $\theta \neq c$). This creates the impression that, quite literally, another person's thoughts are articulated through the speaker's

mouth, with interesting literary effects, as seen in (84) and (85). (It was also claimed in Schlenker 2004 that the opposite pattern, i.e. $c = \theta$ and $\upsilon \neq c$, is found in a different literary style, the 'Historical Present'. For simplicity we disregard this point in what follows).

This analysis might explain why Free Indirect Discourse shares some important properties with direct discourse. But it makes entirely incorrect predictions about cases in which a Hebrew present tense denotes a past moment in Free Indirect Discourse (as it may in Standard Indirect Discourse)[12]. This and related observations lead Sharvit (2008) to posit a special attitude operator in Free Indirect Discourse, one that shifts the world parameter, as well as (a) the context of evaluation of all indexicals, and (b) the denotation of apparently free pronouns (which are evaluated from the thinker's perspective, so to speak; technically, Sharvit's operator quantifies over assignment functions, which means that all pronouns end up being bound). Finally, (c) an agreement mechanism similar to that used for standard indirect discourse guarantees that De Se pronouns inherit the 'right' morphological features (see Sharvit 2004, 2008 for an implementation).

Although the empirical and conceptual issues raised by Free Indirect Discourse might be some of the most fascinating in all of indexicality theory, the relative paucity of work informed by recent semantic theory has left the debate rather open (though some of the excellent descriptive literature on this topic will hopefully be brought to bear on this issue in future research).

6.2 Semantic Relativism

Semantic Relativism holds that the behavior of certain expressions - notably predicates of taste and epistemic modals - is best analyzed within a semantics that countenances both a context of use and a 'context of assessment' (see, among others, MacFarlane 2005, 2007, and Lasersohn 2005). The basic argument has three steps:

Step 1. The truth conditions of predicates of taste and epistemic modals suggest that they are context sensitive: *Roller-coasters are fun* is true just in case roller-coasters are fun *for the speaker*. *It might rain tomorrow* is true just in case there is some world compatible with what the speaker believes in which it rains tomorrow.

Step 2. The patterns of disagreement that are found with predicates of taste or epistemic modals are different from those that are obtained with standard indexicals:

---

[12] The behavior of future tense might also present an insuperable difficulty for the analysis of Schlenker 2004. It is a robust fact that in a non-past attitude report an embedded future is always shifted:

(i) Tomorrow at this precise time, John will think / realize that he is / *will be late for his train.

Sharvit's prediction, then, is that a non-shifted future tense should be similarly prohibited in examples that involve Free Indirect Discourse with respect to a future thought. Such examples are not trivial to construct, but to the extent that they can be I believe that they confirm Sharvit's prediction:

(ii) Tomorrow at this precise time, John will stand in horror at the entrance of the train station.
a. 'I am late for my train', he will think.
b. ?He is late for his train, he will think.
c. #He will be late for his train, he will think.
b'. He will think that he is late for his train.
c'. #He will think that he will be late for his train.

[the deviance of b. is not straightforward to understand]. These contrasts are relatively expected on an operator-based view, but not on an operator-free view.

(88) John says: My name is 'John'.
Peter says: My name is not 'John'.
=> John and Peter do not disagree

(89) John says: Roller-coasters are fun.
Peter says: Roller-coasters are not fun.
=> John and Peter disagree

(90) John says: It might rain tomorrow.
Peter says: It's not the case that it might rain tomorrow
=> John and Peter disagree

Step 3. Predicates of taste and epistemic modals depend on a context parameter, but not on the *same* context parameter as standard indexicals. Rather, they depend on the *context of assessment*, i.e. the context which respect to which the truth of a sentence is assessed, rather than the context in which the sentence is uttered. When one assesses the truth of two claims, one has no choice but to evaluate them with respect to *one and the same context of assessment* (by definition of what a context of assessment is!). By contrast, in such situations one evaluates 'normal' indexicals with respect to the context of utterance in which they were originally pronounced, not with respect to the new context. This accounts for the contrast between (88) on the one hand and (89)-(90) on the other.

The debate about semantic relativism is a particularly lively one, and it should certainly be considered entirely open at this point. The arguments that bear on this discussion are both empirically subtle and conceptually complex. Without doing justice to the debate, let us note that the argument for bicontextualism is less direct in the case of Semantic Relativism than it is in the case of Free Indirect Discourse. In the latter case, the argument is a standard truth-conditional one: if *now* and the present tense were interpreted relative to the same context, one would expect certain sentences that are coherent to be contradictory (the same argument applies to other indexicals). In the case of Semantic Relativism, the argument for bicontextualism is based on a discrepancy between two kinds of intuitions: truth-conditional data on the one hand, and intuitions about agreement / disagreement on the other. The latter might be analyzed in semantic terms; but there might also be arguments in favor of a pragmatic analysis. One reason to believe this is that even when a statement is made explicitly indexical, we get strong intuitions that two individuals disagree even when their statements are truth-conditionally compatible:

(91) Ann says: I believe that President Bush is in Japan.
Bill says: And I believe that he isn't.

There is little doubt that Ann and Bill contradict each other. And yet the literal meanings of their utterances are compatible - in fact, trivially so if both are sincere (see also von Fintel & Gillies 2006 for discussion). In this case some additional semantic or pragmatics facts appear to be responsible for the impression that Bill has contradicted Ann. It is not entirely obvious how this intuition should be spelled out, nor whether the pragmatic strategy could be successfully applied to all cases that have been taken to argue for semantic relativism.

***

As will be clear, our understanding of indexicality has changed significantly since Kaplan's pioneering work. On a formal level, semantic studies of attitude reports have been forced to take seriously the possibility of shifting the context parameter and/or of quantifying

over context-like entities. On an empirical level, a rich typology of attitude operators and indexical expressions has been uncovered across languages; the extent of language and/or lexical variation in this domain is only beginning to be understood. As a result, foundational studies of indexicality are now inextricably tied with detailed typological work.

7. References

Abusch, Dorit 1997. Sequence of tense and temporal *de re*. *Linguistics and Philosophy* 20: 1-50

Adesola, Oluseye 2005. *Pronouns and Null Operators – A-bar Dependencies and Relations in Yorùbá*. Ph. D. Dissertation, Rutgers.

Anand, Pranav & Andrew Nevins 2004. Shifty operators in changing contexts. In: *Proceedings of Semantics and Linguistic Theory (=SALT) 14*.

Anderson, Stephen R. & Edward L. Keenan 1985. 'Deixis', in Timothy Shopen (ed.) *Language Typology and Syntactic Description,* Volume 3: Grammatical Categories in the Lexicon. Cambridge University Press.

Banfield, Ann 1982. *Unspeakable Sentences (Narration and Representation in the Language of Fiction),* Routledge & Kegan Paul.

Bary, Corien, & Emar Maier 2003. Ancient Greek monsters. In: *Szklarka Poreba 4*.

Castañeda, Hector-Neri 1966. He: A study in the logic of self-consciousness. *Ratio* 7.

Castañeda, Hector-Neri 1967. Indicators and Quasi-Indicators. *American Philosophical Quaterly,* 4(2).

Castañeda, Hector-Neri 1968. On the logic of attributions of self-knowledge to others. *The Journal of Philosophy*, 65(15).

Chierchia, Gennaro 1987. Anaphora and attitudes *de se'*. In: B. van Bartsch & E. van Boas (eds.) *Language in Context,* Dordrecht, Netherlands: Foris.

Clements, George N 1975. The logophoric pronoun in Ewe: Its role in discourse. *Journal of West African Languages* 10: 141-77

Cresswell, Maxwell 1990. *Entities and Indices,* Kluwer

Doron, Edit 1991. 'Point of View as a Factor of Content', *Semantics and Linguistic Theory (=SALT)* I.

Fabricius-Hansen, C & Saebø, K 2004. In a mediative mood: The semantics of the German reportive subjunctive. *Natural Language Semantics*, 12 , 213 – 257 .

Frajzyngier, Zygmunt 1985. Logophoric systems in Chadic. *Journal of African Languages and Linguistics* 7: 23-37

Frajzyngier, Zygmunt 1993. *A Grammar of Mupun,* Dietrich Reimer Verlag

Haas-Spohn, Ulrike 1995. *Versteckte Indexicalität und subjektive Bedeutung,* Studia Grammatica 38, Akademie Verlag.

Haas-Spohn, Ulrike 1994. *Versteckte Indexicalität und subjective Bedeutung*. Ph. D. Dissertation, Universität Tübingen. English translation at http://www2.sfs.nphil.uni-tuebingen.de/Alumni/Dissertationen/ullidiss/.

Hagège, Claude 1974. Les pronoms logophoriques. *Bulletin de la Société de Linguistique de Paris* 69, 287-310

Harris, Jesse Aron and Potts, Christopher 2009. Perspective-shifting with appositives and expressives. Ms., University of Massachusetts, Amherst and Stanford University.

Heim, Irene 1991. Class hand-outs on 'Control' (Seminar taught by Heim & Higginbotham, Spring 1991): 'Interpretation of PRO' (Feb. 22), 'The first person' (March 8), and a hand-out on 'connectedness' (April 12).

Heim, Irene 2005.*Features on Bound Pronouns* . Ms. MIT Department of Linguistics.

Heim, Irene 2007. *Person and Number on Bound and Partially Bound Pronouns*. Ms. MIT Department of Linguistics.

Higginbotham, James 2003. Remembering, imagining, and the first person. In: A Barber (ed.) *Epistemology of language*, 496–533. Oxford: Oxford University Press.

Hyman, L. M. (ed.) 1979. *Aghem Grammatical Structure*. Southern California Occasional Papers in Linguistics No. 7

Hyman, Larry M & Bernard Comrie 1981. Logophoric reference in Gokana. *Journal of African Languages and Linguistics* 3: 19-37

Israel, David & John Perry 1996. Where monsters dwell. In: Seligman & Westerståhl (ed.) *Logic, Language and Computation* 1.

Jäger, Siegfried 1971. *Der Konjunktiv in der deutschen Sprache der Gegenwart,* Max Hueber Verlag.

Janssen, Theo & Wim van der Wurff (ed) 1996. *Reported Speech,* John Benjamins

Kammerzell, Franz & Carsten Peust 2002. Reported speech in Egyption: Forms, types and history. In: Tom Güldemann & Manfred von Roncador (eds) *Reported Speech as a Meeting Ground for Different Linguistic Domains*. Typological Studies in Language, Benjamins: 289-322.

Kamp, Hans 1971, Formal properties of 'now'. *Theoria*, 37: 227–273.

Kamp, H. and Rohrer, C 1983. Tense in texts. In: R. Bäuerle, C. Schwarze & A. von Stechow (eds.) *Meaning, Use and Interpretation of Language,* 250-269, de Gruyter, Berlin.

Kaplan, David 1969. Quantifying in. In: D. Davidson & J. Hintikka (eds.) *Words and Objections* Dordrecht: Reidel.

Kaplan, David 1977/1989. Demonstratives. In Almog, Perry & Wettstein (eds.) *Themes from Kaplan*. Oxford University Press, 1989

Kaplan, David 1978. On the logic of demonstratives. *Journal of Philosophical Logic*, 8: 81-98.

Kaplan, David 1989. Afterthoughts. In: Almog, Perry & Wettstein (eds.) *Themes from Kaplan*. Oxford University Press.

Kaplan, David 1990. Thoughts on Demonstratives. In P. Yourgrau (ed.) *Demonstratives,* Oxford University Press.

Kondrashova, Natalia 1998. Embedded Tenses in English and Russian. Ms., Cornell University, Ithaca, N.Y.

Kratzer, Angelika 1998. More structural analogies between pronouns and tenses. In: *Proceedings of Semantics and Linguistic Theory (= SALT) VIII*

Kratzer, Angelika 2008. Making a pronoun: Fake indexicals and windows into the properties of pronouns. To appear in *Linguistic Inquiry*.

Lasersohn, Peter 2005. Context dependence, disagreement, and predicates of personal taste. *Linguistics and Philosophy* 28: 66, 643-686

Lee, R.G., C. Neidle, D. MacLaughlin, B. Bahan, and J. Kegl 1997. Role shift in ASL: A syntactic look at direct speech. In: C. Neidle, D. MacLaughlin & R.G. Lee (eds.) *Syntactic structure and discourse function: An examination of two constructions in asl,* report number 4, 24–45. Boston: Boston University.

Lewis, David 1983. Attitudes de dicto and de se. In *Philosophical Papers - Volume 1*, Oxford University Press.

Lewis, David 1980. Index, context, and content. In: S. Kanger & S. Ohman (eds.), *Philosophy and Grammar*, 79–100. Dordrecht: Reidel. Reprinted in Lewis 1998.

Lewis, David 1998. *Papers in Philosophical Logic*. Cambridge University Press.

Lillo-Martin, Diane 2009. Utterance reports and constructed action in sign and spoken languages. Manuscript, University of Connecticut.

MacFarlane, John 2005. Making sense of relative truth. *Proceedings of the Aristotelian Society* 105, 321–39

MacFarlane, John 2007. Relativism and disagreement. *Philosophical Studies* 132, 1, 17-31

Maier, Emar 2006, *Belief in Context: Towards a Unified Semantics of De Re and Se Attitude Reports*. Ph.D. Dissertation, U. of Nijmegen.

Morgan, Jerry 1970. On the criterion of identity for noun phrase deletion. In *Proceedings of Chicago Linguistic Society (= CLS)* 6.

Ogihara, Toshiyuki 1996. *Tense, Attitudes, and Scope*. Kluwer.

Oshima, David Y. 2006 *Perspectives in Reported Discourse*. Ph.D thesis, Department of Linguistics, Stanford University

Partee, Barbara 1973. Some structural analogies between tenses and pronouns in English. *The Journal of Philosophy* 70, 601-609.

Percus, Orin & Sauerland, U 2003a. On the LFs of attitude reports. In: M. Weisgerber (ed.) *Proceedings of Sinn und Bedeutung 2002*. Universität Konstanz, Konstanz, Germany.

Percus, Orin and Sauerland, U 2003b. Pronoun binding in dream reports. In: M. Kadowaki & M. Kawahara (eds.). *Proceedings of the North East Linguistic Society (= NELS)* 33. GLSA, University of Massachusetts, Amherst.

Perry, John 1993. The problem of the essential indexical. In *The problem of the essential indexical and other essays*. Oxford University Press.

Portner, Paul 1992. *Situation Theory and the Semantics of Propositional Expressions*. Ph. D. Dissertation. Electronic Doctoral Dissertations for UMass Amherst. Paper AAI9305882. http://scholarworks.umass.edu/dissertations/AAI9305882

Potts, Christopher 2007. The expressive dimension. Target article (with commentaries) in *Theoretical Linguistics* 22(2).

Predelli, Stefano 1998. Utterance, interpretation and the logic of indexicals. *Mind and Language* 13, 400-414

Quer, Josep 2005. Context shift and indexical variables in sign languages. In *Proceedings of Semantic and Linguistic Theory (= SALT)* 15.

Quine, Willard Van 1956. Quantifiers and propositional attitudes. *Journal of Philosophy,* 53.

Recanati, François 2004. Indexicality and Context-Shift. Manuscript, Institut Jean-Nicod.

Reinhart, Tanya 1983. Point of view in language - The use of parentheticals. In: G. Rauh (ed.) *Essays on Deixis,* Gunter Narr Verlag Tübingen.

Reinhart, Tanya 1990. Self-representation. Lecture given at the Princeton Conference on Anaphora, October 1990.

Reinhart, Tanya & Reuland, Eric 1993. Reflexivity. *Linguistic Inquiry* 24:657-720.

Rice, Karen 1986. Some remarks on direct and indirect speech in Slave (Northern Athapaskan). In *Direct and Indirect Speech*. Mouton de Gruyter.

Roncador, Manfred von 1988. *Zwischen direkter und indirekter Rede,* Niemeyer.

Rullmann, Hotze 2003. Bound-variable pronouns and the semantics of number. In: B. Agbayani, P. Koskinen & V. Samiian (eds.) *Proceedings of the Western Conference on Linguistics (= WECOL)* 2002, 243-54. Fresno: Department of Linguistics, California State University.

Rullmann, Hotze 2004. First and second person pronouns as bound variables. *Linguistic Inquiry* 35: 159-68.

Rullmann, Hotze 2008. Binding and person/number features: Prospects and challenges for a semantic approach. To appear, *Proceedings of Semantics and Linguistic Theory (= SALT) 2008*.

Sauerland, Uli 2007. Belief report basics. Lecture Notes for a course taught at the EGG Summer School in Brno, Czech Republic, August 2007.

Sauerland, Uli and Mathias Schenner 2007. Embedded evidentials in Bulgarian. In: E. Puig-Waldmüller (ed.) *Proceedings of Sinn und Bedeutung* 11, Barcelona: Universitat Pompeu Fabra, 495–509.

Schlenker, Philippe 2003. A Plea for Monsters. *Linguistics and Philosophy* 26: 29-120

Schlenker, Philippe 2004. Context of thought and context of utterance (A note on free Indirect discourse and the historical present. *Mind and Language* 19: 3, 279-304

Sells, Peter 1987. Aspects of logophoricity. *Linguistic Inquiry* 18(3): 445-179.

Sharvit, Yael 2003. Embedded tense and Universal Grammar. *Linguistic Inquiry* 34: 669-681.

Sharvit, Yael 2004. Free indirect discourse and *de re* pronouns. In: R. Young (ed.), *Proceedings of Semantics and Linguistic Theory (= SALT)* 14. CLC Publications, Cornell University, 305-322.

Sharvit, Yael 2008. *The Puzzle of Free Indirect Discourse*. Ms. University of Connecticut.

Speas, Margaret 1999. Person and Point of View in Navajo. *Proceedings of West Coast Conference of Formal Linguistics* 18.

Stalnaker, Robert 1981. Indexical belief. *Synthese* 49

Stalnaker, Robert 1999. *Context and content*. Oxford University Press.

Stechow, Arnim von 2002. *Binding by Verbs: Tense, Person and Mood Under Attitudes*. Ms. U. of Tübingen.

Stechow, Arnim von 2003. Feature deletion under semantic binding. In *Proceedings of the North East Linguistic Society (= NELS)* 2003.

Stechow, Arnim von & Thomas Ede Zimmermann 2005. A problem for a compositional treatment of de re attitudes. In: G. Carlson & F. J. Pelletier (eds.) *Reference and Quantification: The Partee Effect*. Stanford, 207-228.

Stone, Matthew 1997. The anaphoric parallel between modality and tense. IRCS Report 97-06, University of Pennsylvania

Szabolcsi, Anna 2009. Overt nominative subjects in infinitival complements in Hungarian. In M. den Dikken & R. Vago (eds.) *Approaches to Hungarian 11: Papers from the New York Conference*. John Benjamins, 251–276

Thomas, Elaine 1978. *A grammatical description of the Engenni language*. Summer Institute of Linguistics Publication Number 60.

Zimmermann, Thomas Ede 1991. Kontextabhängigkeit. In Arnim von Stechow & Dieter Wunderlich (eds.) *Semantik: ein internationales Handbuch der zeitgenössischen Forschung*.

Zucchi, Sandro 2004. *Monsters in the Visual Mode?* Ms., Università degli studi di Milano