# Double access[1]

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**Abstract.** In light of counterexamples against Abusch's analysis of double access sentences we propose a modification that abandons her Upper Limit Constraint (ULC). We then show that rather than being an ad hoc solution, this modification, in fact, fits in neatly with the semantics of the present tense proposed by Altshuler and Schwarzschild. We end the paper by exploring some of the consequences of our modification and discussing some outstanding issues.

**Keywords:** double access, temporal *de se*, tense, attitude reports, speech reports.

## 1. Introduction

This paper is about the occurrence of present tense verbs in the complement of past tense attitude verbs, as for example in (1):

(1)     John thought that Mary is pregnant.

The question that we want to address in this paper is one that has already received a lot of attention in the literature: when can we use such sentences? In addressing this question, the key intuition, going back to Carlota Smith's work in the seventies, has been that such sentences make reference to two times. Hence the name *double access* used to describe the interpretation of (1). Intuitively, the two relevant times are:

**TOY ANALYSIS** (TO BE REVISED)

1. the time of John's attitude

2. the utterance time

As for the first time, the time of John's attitude, note that if Mary's pregnancy is entirely in the future of John's thinking, a proper report could be (2) or (3) below, but not (1):

(2)     John thought that Mary would be pregnant.

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(3)        John thought that Mary will be pregnant.

And similarly, if Mary's pregnancy is entirely in the past of John's thinking, a proper report could be (4) or (5), but again it cannot be (1).

(4)        John thought that Mary was pregnant.

(5)        John thought that Mary had been pregnant.

(1) can only be used if the time of the pregnancy includes the time of John's thinking. But the utterance time is relevant too! The use of a present tense in (1) is infelicitous if the pregnancy does not include the utterance time of the sentence. This observation, which goes back to Smith 1978, is independent of whether the pregnancy includes the time of John's thinking. To see this, consider a situation in which the pregnancy only includes the time of John's thinking and not the utterance time. In such a case, a past tense in the embedded clause (viz. sentence (4)) would be used instead of the present.[2]

As first noted by Enç (1987, 637), the claim that (1) involves reference to both the time of the attitude and the utterance time allows one to explain the oddity of (6):

(6)        #John thought two years ago that Mary is pregnant.

In order for (6) to be true, the pregnancy would have to include both the time of the thinking, which is two years ago, and the utterance time. However, since human pregnancy cannot possibly cover a time span of two years, (6) is odd.

Although the toy analysis presented in this section captures what is going on in (1) and (6) at an intuitive level, it has turned out that serious complications arise when these intuitions are made more precise and incorporated into a general theory of tense and attitude reports. In section 2 we will discuss these complications in light of von Stechow's (1995) and Abusch's (1997) pioneering work and see that much of what we said in this section has to be either refined or revised. Then, in section 3, we will introduce Heim's (1994) reformulation of Abusch's (1997) account of double access reports, which was designed to deal with these complications. We point to some further complications involving mistaken-time scenarios and this leads to an amendment in section 4. The amendment involves abandoning the Upper Limit Constraint, a move which we argue is not an ad hoc solution, but, in fact, follows from the semantics of the present tense. In section 5 we discuss

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[2]Here we disregard the usage of an embedded historical present, which would yield an interpretation on a par with (4) rather than double access. We discuss such cases in the conclusion.

the consequences of giving up the Upper Limit Constraint and some outstanding issues.

## 2. Complications with the toy analysis: temporal *de se* and *de re*

2.1. Temporal *de se*

The first complication concerns the first time parameter of our toy analysis: the time of John's attitude. It has been known for some decennia now that – unlike what we wrote in the previous section! – there is, in fact, no direct link between the time of the event described in the complement of an attitude verb (here the pregnancy) and the time of the attitude itself (von Stechow 1995). We see this in situations where the attitude holder, John, is mistaken about the time.

Imagine that John thinks it is 10 am when it is really 9am. In such a scenario, (7), when uttered at 9 am, is true.

(7)      John thinks that it is 10 am.

However, as noted by von Stechow, if we were to let the present tense refer to the time of John's thinking, namely 9 am, and assume that the object of belief is a set of possible worlds (Hintikka 1962), we would derive that John believes that 9 am is 10 am, which is a contradiction. As a consequence, he would believe in the empty set of possible worlds, which means that he would believe literally everything. In other words, we would ascribe to John a belief that is absurd whereas, in fact, he is simply mistaken about the time, something that happens to us all the time.[3]

To solve this puzzle, von Stechow proposed that the present tense refers to the time John *thinks* it is (at the time of his reported thinking), rather than to the actual time at which his thinking takes place. In other words, what is relevant is where the attitude holder locates himself on a time line at the time of his thinking (*the attitude holder's now*) and not where he really is. Combined with Lewis' (1979) reinterpretation of belief as the self-ascription of properties (rather than a propositional operator), we get that John ascribes the time where he locates himself the property of being 10 am, which is a natural interpretation of (7). This discussion leads us to the first modification of our toy analysis: When we interpret the present tense in the complement of an attitude verb we have to relate that to the attitude holder's now, rather than to the time of the thinking itself:

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[3]See Bary and Maier (2009) for a discussion of the analogy between this argument and a similar argument in the nominal domain.

The event described in the complement includes:                          **FIRST MODIFICATION**

1. ~~the time of the attitude~~         the attitude holder's now

2. the utterance time

## 2.2. Temporal *de re*

The second complication concerns the utterance time. Here the question is not whether it plays a role, but what role it plays.

Let's start with an obvious observation. (1), repeated below as (8), describes what the world looks like *according to John*.

(8)     John thought that Mary is pregnant.

As observed by Abusch (1997, 40), (8) can be true even if Mary was never pregnant in the real world. Abusch provides evidence for this claim by observing that a report like (9) is not contradictory:

(9)     John thought that Mary is pregnant but she is simply overeating.

In light of these data, Abusch concludes that whatever the correct semantic analysis of (8) is like, it should not entail actual pregnancy of Mary (in the past, present or future).

But the sentence is not entirely a description of the world *according to John*. When he had this thought, John was not making a prediction about the utterance time (e.g. January 11, 2015 if we utter this sentence at the time of our writing this paper). That is, John was not making a prediction about a time that would be future from his point of view. He was just thinking about how things were at his time. This means that although the sentence does describe John's attitude and although the sentence is about the utterance time (and therefore that time does, in fact, play a role in the semantics of the sentence), that time need not necessarily have played a role in John's mind. Based on this intuition, Abusch proposes that in addition to a *de se* component, the interpretation of the present tense in (1) also has a *de re* component.[4] As a result we get:

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[4]It should be noted that there have been arguments put forth that Abusch's intuitions don't warrant a *de re* analysis of the present tense (Gennari 2003, Smirnova 2009 and Klecha 2014). We don't take a stance on this issue here though ultimately, in section 4.2, we adopt an analysis in which the present tense is not interpreted *de re*. Until section 4.2, we

the **believed** event described in the complement includes:                    FINAL VERSION

1. the attitude holder's now                                                                *de se*

2. the utterance time               but not necessarily in John's mind              *de re*

This remarkable combination of *de se* and *de re* interpretation forms a true challenge for a semantic analysis of double access. In the next section, we outline Heim's (1994) reformulation of Abusch's (1997) analysis that attempts to meet this challenge.

## 3. Abusch's account of double access Heim-style

Abusch argues that a semantic analysis of double access sentences requires acquaintance relations about times. In this paper we follow Heim's (1994) reformulation of Abusch's (1997) account who uses the term *time concepts*. She describes time concepts as 'the meanings of descriptions by which a thinker might represent a time to herself' (Heim, 1994, 155). Technically, a time concept is a function from world time pairs to times. Here are two examples:

- the time concept of 'today' is a function that maps each $\langle w, t \rangle$ to the day of $t$

- the time concept of 'the last time the lights went out' is a function that maps each $\langle w, t \rangle$ to the last $t' \prec t$ such that the lights went out at $t'$ in $w$

In order to account for the observations that we discussed in the previous section, Heim proposes that (1) (= (8)) is uttered felicitously only if the context provides a time concept *f* that satisfies the following two constraints:

HEIM CONSTRAINTS

1. *f* evaluated with respect to the attitude holder's world and now (at the time of his attitude) should not follow the attitude holder's now completely

2. *f* evaluated with respect to the actual world and the time of the attitude should overlap with the utterance time

And if the felicity conditions are fulfilled, the sentence is true iff in all worlds $w'$ and times $t'$ compatible with John's beliefs in the actual world at the time of the attitude, the time where John locates himself has the property of being a Mary-is-pregnant time in $w'$ at $t'$.

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will continue to talk about the *de re* component in the interpretation of the present tense since it is vital in Abusch's analysis.

Let's see how this yields what we have labelled as FINAL VERSION in the previous section. The first condition captures the *de se* component: it requires that the time-concept implies non-futurity *for John*. (We will later come back to why the implication is non-futurity and not presentness). The second condition captures the *de re* component. The attitude holder has a time concept in mind and this time concept happens to yield the actual utterance time (when evaluated with respect to the actual world and time of the attitude), but the fact that it yields this time is not because the attitude encodes it.

Let's now take a look at a concrete example (from Abusch and discussed by Heim). Imagine that John sees Mary having a big belly and thinks that Mary is pregnant while the cause for right now visible big belly lasts. Then *f*, the time concept, is the meaning of the description 'while the cause for her right now visible big belly lasts'. This is a function that maps each $\langle w, t \rangle$ to the maximal interval that includes $t$ during which the cause of her big belly holds. The HEIM constraints now make predictions about the felicity conditions of the report in (1), given this time concept. The first constraint is satisfied trivially: we feed the function corresponding to the time concept with the attitude holder's world and now. Since the function returns an interval that includes the time of the input, i.e. the attitude holder's now, it is a fortiori an interval that is not entirely in the future for John. The second constraint is satisfied only if whatever it was that caused the state of Mary's big belly at the time of the attitude still holds at the time of the utterance, or put simpler, if Mary still has a big belly at the utterance time. In this way, Abusch and Heim, on the one hand, account for the intuition described in section 1 that the pregnancy has to include the actual utterance time and, on the other hand, avoid that the semantics assigned to the sentence entails any actual pregnancy for Mary.

Assuming the attitude holder is not mistaken about the time, the HEIM constraints also explain why (6), repeated here as (10), is odd irrespective of a particular (non-mistaken time) scenario and irrespective of a particular time concept.

(10)     #John thought two years ago that Mary is pregnant.

The second HEIM constraint states that the time yielded by *f* when evaluated with the respect to the actual world and time of the attitude should overlap with the actual utterance time (see Figure 1 below). The past tense tells us that the time of the attitude is in the past of the utterance time and the time adverbial specifies that there is two years in between the two. The fact that we have assumed that the attitude holder is not mistaken about the time gives us that attitude holder's now is identical to the time of the attitude. And finally, the first constraint tells us that *f*, when evaluated with respect to the attitude holder's world and now, should not follow the attitude holder's now completely. This leaves open the possibilities that it either overlaps with the attitude holder's now (see Figure 1 below), or is entirely in the past of the attitude holder's now, but either way, for the sentence to be true, the pregancy John believes in would have to include a time span of more than two years, which is impossible (given that John is well-informed about basic human affairs).

*pregnancy*

*times yielded by f*

*time of the attitude*                        *utterance time*
*=*
*attitude holder's now*

2 years

Figure 1: the infelicity of (6)

But what if the attitude holder is mistaken about the time? Recall that this is not a marginal case: we made the first modifcation in section 2 (from time of the attitude to attitude holder's now) exactly because people can be mistaken about the time (and often are mistaken about the time). Note also that in the concrete example that we gave, where we took for *f* the meaning of the description 'while the cause of her right now visible big belly holds', the two constraints did give the right predictions without any specification of whether or not the attitude holder was mistaken about the time. And it turns out that this holds for many other plausible time concepts too: they make the correct predictions irrespective of the scenario (see Heim 1994 for many such time concepts in various contexts). However, it is also possible to construct counterexamples in mistaken-time scenarios.

Imagine that today John declares: 'I think that Bill's 40th birthday was some time ago and that Mary was pregnant on that day'. Let's assume that John is mistaken. In fact, Bill's 40th birthday is today, i.e. the day of John's thinking! As noted by Heim (1994: fn. 28) there is a strong intuition that in this context, (11) could not be uttered felicitously.

(11)      John thought that Mary is pregnant.

Let's now see why the wrong prediction is made by the **HEIM** constraints. In the scenario just described, it seems natural to take the time concept to be the meaning of the description 'on Bill's 40th birthday'. The scenario satisfies the first constraint: the time concept evaluated with respect to John's world and now is in the past of John's now (for John 'on Bills 40th birthday' is in the past of where he locates himself) and hence not completely in the future. The second constraint is also satisfied in the scenario: evaluated with respect to the actual world and time the time concept yields today, a time that can overlap with the actual utterance time. Since both constraints are satisfied, the prediction is that the sentence is felicitous in this context, contra to our intuitions.

Heim suggests that we could circumvent this problematic prediction by generally banning so-called *time neutral concepts*. A concept such as 'on Bill's 40th birthday' is temporally neutral

since there is nothing about the meaning of 'on Bill's 40th birthday' that tells us where it is located with respect to the utterance time. While this suggestion does, indeed, solve the problem, it is a stipulation; nothing is said about *why* time neutral concepts ought to be ruled out. In light of this, we believe that Heim's reformulation of Abusch's analysis has hit a serious road block, one that requires an amendment.

## 4. An amendement to HEIM's constraint

### 4.1. Presentness

The attentive reader might have observed already that the counterexample could only arise because the first HEIM constraint had quite a relaxed temporal relation: non-futurity rather than presentness. The reader might also have noticed that so far we haven't seen any arguments for why it should be non-futurity. In fact, purely based on the discussion in section 2.2 (viz. FINAL VERSION: 'the event described *includes* …') the choice for presentness would have been more natural. This, in fact, is our proposed solution to the problem identified in the previous section. That is, the first HEIM constraint should have a stricter temporal restriction: presentness rather than non-futurity. This amendment is outlined below (in bold):

HEIM CONSTRAINTS, AMENDED VERSION

1. *f* evaluated with respect to the attitude holder's world and now (at the time of his attitude) **should overlap the attitude holder's now**

2. *f* evaluated with respect to the actual world and the time of the attitude should overlap with the actual utterance time

Let's now see why this amendment allows us to rule out "John thought that Mary is pregnant" as a report of what happened earlier today, namely when John declared: "I think that Bill's 40th birthday was in the past and that Mary was pregnant on that day" despite that fact that Bill's 40th birthday is really today. As before, let's assume that the time concept is the meaning of the description 'on Bill's 40th birthday'. In this case, the scenario does not satisfy the first constraint above: the time concept evaluated with respect to John's world and now is in the past of John's now (for John 'on Bills 40th birthday' is in the past of where he locates himself) and hence not overlapping (as is now required). The fact that the second constraint is satisfied is now besides the point.

Given the relative ease with which we were able to solve the problem, the natural question to ask is: why didn't Abusch and Heim posit presentness rather than non-futurity? As we shall see in section 5, the reason is tied to the Upper Limit Constraint. Before discussing this constraint, we would now like to show how our amended constraints follow straightforwardly from the semantics of the present tense proposed by Altshuler and Schwarzschild (2013).

## 4.2. The meaning of the present tense

Altshuler and Schwarzschild (2013) proposed that the present tense in English is an amalgam of both a relative and an absolute present. More concretely, they proposed that the English present demands truth at: (i) the local evaluation time and (ii) at or after the utterance time. (i) is the relative tense component. It is reminiscent of the first **HEIM** constraint that we amended in the previous subsection. The key difference is that (i) incorporates the notion *local evaluation time*, which is more general than the attitude holder's now; the *local evaluation time* is also relevant for characterizing simple sentences like 'John is happy', where it is simply the utterance time (Abusch 1997). As for (ii), it is the absolute tense component. It is reminiscent of the second **HEIM** constraint. The key difference is that (ii) is more general, imposing a non-past requirement (rather than a purely present requirement). This is motivated by well-known examples such as (12), which is true if the described fish is born after (12) is uttered.

(12)     John will buy a fish that is alive.                                            (after Ogihara 1989)

Altshuler and Schwarzschild make the common assumption that the local evaluation time for the interpretation of the present tense of *is* in (12) is a time, introduced by *will*, in the future of the utterance time. Since (i) demands truth at this time and this time is in the future of the utterance time, the state of the fish being alive is in the future of the utterance time and therefore (ii) is satisfied automatically. In other words, the contribution of the absolute component of the present tense in (12) is indistinguishable from that of the relative component.

Now consider (13):

(13)     John bought a fish that is alive.

Here, there is no intensional operator (e.g. an attitude verb or *will*), so the local evaluation time for the interpretation of the present tense *is* is the utterance time (just like in 'John is happy'). Since the local evaluation time is the utterance time and (i) requires truth at this time and (ii) at or after this time, the (correct) prediction is that the fish is alive at the utterance time. Note that, once again, the absolute component does not add any restrictions other than what is already demanded by the relative component: it simply requires a looser relation to the same time. So why do we need the absolute component at all? In fact, the ingenuity of Altshuler and Schwarzschild's proposal is that the relative and absolute components of the present tense are indistinguishable in all cases but one: double access reports of the kind that we have been considering.

Altshuler and Schwarzschild propose a quantificational analysis of tense with intensional domain restriction. These domain restrictions involve time concepts which are like Heim's time concepts,

with one key difference: the times that they describe are not (in any way) determined by *res* movement or some other *de re* mechanisms (as is the case in Abusch 1997, Heim 1994 and many analyses of tense thereafter[5]). Altshuler's and Schwarzschild's theory is thus an alternative to a *de re* analysis of double access (cf. Gennari 2003, Smirnova 2009 and Klecha 2014).

Let us consider how Altshuler and Schwarzschild would analyze our core example, repeated below in (14).

(14)      John thought that Mary is pregnant.

Reformulated in terms of *f* to facilitate a comparison with Heim's analysis, Altshuler and Schwarz- schild would capture the meaning of this report by the formulas below, in (15) and (16), where *f* (and *f'* for the location of the matrix event) continues to denote a time concept, only now function- ing as the restrictor of a quantifier; $s^*$ and $w^*$ denote the utterance-time and the utterance-world of (14) respectively; $w_0$ and $t_0$ denote the (local) evaluation world and time respectively.

(15)      $\lambda w_0. \exists t \, (t \prec s^* \wedge t \in f'(w_0, s^*) \wedge \text{think}(\text{john}, w_0, t, \phi))$, where $\phi = (16)$

(16)      $\lambda t_0 \lambda w_0: t_0 \in f(w_0, t_0) \wedge \exists t' (t' \succeq s^* \wedge t' \in f(w^*, t)). \forall t''(t'' \in f(w_0, t_0) \rightarrow \text{be.pregnant}(w_0, t'', \text{mary}))$

According to the formula in (15), John's thinking that $\phi$ took place in the world of evaluation $w_0$ at a time *t* that is prior to the utterance time $s^*$. The location of this event is further restricted by the condition $t \in f'(w_0, s^*)$. Since we are here mainly interested in the interpretation of the embedded present tense we simply note that the effect of this condition is similar to that of the use of *reference times* or *topic times* in much of the literature on the interpretation of tense and aspect in discourse.

As for the formula in (16), things are more complex. The crucial thing to notice is that the afore- mentioned relative and absolute components of the present tense are treated as presuppositional constraints on the time concept *f*: the relative component states that *f* evaluated at $w_0$, $t_0$ must in- clude the local evaluation time $t_0$; the absolute component requires that this *f*, when evaluated with respect to $w^*$, *t* includes a time *t'* that is at or after the utterance time $s^*$. Apart from these pre- suppositions on *f*, the present tense also contributes a universal statement to the assertion, namely that Mary's pregnancy state in $w_0$ holds throughout the time interval *t''* described by *f* in $w_0$ at $t_0$. If we assume that *f* is the *today*-function, then given the universal statement in the assertion of (16), it must have been compatible with what John thought (in the past) that Mary continued to be pregnant throughout the day–in fact, the whole day–not just after John's utterance, but also at the

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[5]See Bar-Lev 2014 for a recent discussion.

utterance time of (14). This is the hallmark of the double access reading that we have been after.[6]

At this point, it is helpful to summarize how this analysis is related to our earlier observations about Heim's reformulation of Abusch's analysis. We observed that in a particular case of mistaken identity (involving Bill's 40th birthday), the **HEIM** constraints made the incorrect predictions. To that end, we proposed the following revision (in bold):

#### HEIM CONSTRAINTS, AMENDED VERSION

1. $f$ evaluated with respect to the attitude holder's world and now (at the time of his attitude) **should overlap the attitude holder's now**

2. $f$ evaluated with respect to the actual world and the time of the attitude should overlap with the actual utterance time

And now we attempted to show that the above constraints follow straightforwardly from the semantics of the present tense proposed by Altshuler and Schwarzschild. The reader can check that if $f$ in (16) is assumed to be the meaning of the description 'on Bill's 40th birthday', which is prior to the attitude holder's now (in the context considered), then we predict a presupposition failure.

## 5. ULC and beyond

While we have been able to revise Heim's reformulation of Abusch's analysis to account for the mistaken identity case (involving Bill's 40th birthday), there is a cost–one that may be considered quite significant in light of some well-known analyses of embedded tense.

To see what is at stake, consider the report in (17):

(17)    John thought that Mary was pregnant.

The intuition behind (17) is that it can be used to report John saying (18) and (19), but not (20):

(18)    Mary was pregnant.

(19)    Mary is pregnant.

(20)    Mary will be pregnant.

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[6]Of course, $f$ need not be the *today*-function. We leave it to the reader to test the predictions of (16) when $f$ describes some other time, as determined by the context.

If we treat the embedded past tense as being absolute, we would say that Mary's pregnancy is located at some time prior to the utterance time. As such, we correctly predict that (17) is compatible with a situation in which the pregnancy held at the time of John's now (assuming he is not mistaken about the time) or prior to it. This captures the correlation between (17) and (18)-(19).

However, as noted by Abusch (1997), the absolute analysis also predicts that (17) is compatible with a situation in which the pregnancy held after John's now (assuming he is not mistaken about the time) and before the utterance time. And as noted above, (17) cannot be used to report John saying (20). This intuition can be sharpened by the contrast below:

(21)     In February, John thought that Mary was pregnant the month before.

(22)     ??In February, John thought that Mary was pregnant the month after.

Abusch showed that both of these contrasts can be accounted for by the Upper Limit Constraint (ULC), which says that the embedded event cannot be later than the local evaluation time.[7] The ULC would directly rule out (17) as a report of (20) since it would prevent Mary's pregnancy from being understood as taking place after John's now.

In addition to ruling out cases like (22), Abusch shows that the ULC could be used to constrain so-called *de re* pasts. These are cases where a past time is introduced in an extensional context and then is re-used in an intensional context, e.g.:

(23)     John found an ostrich in his apartment yesterday. Just before he opened the door, he
         thought that a burglar attacked him (Abusch 1997: 4).

Abusch notes that without the ULC, the following would predicted about the discourse above: the embedded tense on "attack" is anaphoric on the past tense which denotes the time of the door opening. From this it follows that John's original thought must have been: "When I open the door, a burglar will attack me". But then, if the door opening is later than John's thinking, the burglar's attack (which is co-temporal with the opening) must also be later than the thinking. The problem is that this is not a possible interpretation of "He thought that a burglar attacked him" in (23). The solution, of course, is to adopt the ULC, which directly rules out this interpretation.

At this point, it should be noted that the data discussed in this section could be used to motivate the non-futurity in the initial **HEIM** constraint, repeated below. That is, the first constraint is a version of the ULC.

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[7]There have been various implementations of this constraint (see e.g. Schlenker 2004 for discussion). In what follows, our discussion of this constraint will apply equally to all formulations that we know of.

## Heim constraints

1. *f* evaluated with respect to the attitude holder's world and now (at the time of his attitude) **should not follow the attitude holder's now completely**

2. *f* evaluated with respect to the actual world and the time of the attitude should overlap with the actual utterance time

Since the non-futurity is something that we got rid of in order to account for mistaken-time cases, we now face the question of whether our account suffers from not being able to explain the data above. The short answer is "no". The longer answer will take some time to unpack and this is the aim of the remainder of this section.

To begin with, note that our choice to analyze the (modified) constraints above as following from the meaning of the present tense means that our proposed analysis is indifferent to the data discussed above, which centers around the behavior of an embedded past tense. In fact, the proposed analysis of double access (i.e. the embedded *present* tense cases) leaves open the possibility to use the ULC (in one way or another) to explain the past tense data discussed in this section so far. However, we don't think that this is the correct way to go. To begin with, Abusch (1997) herself points out that an analysis that treats the past tense as being absolute cannot explain examples like those in (24), regardless of whether the ULC is adopted. Here, the past tense on "were" in the most embedded clause does not denote a time prior to the utterance of (24) (and arguably does not denote a time prior to any other time alluded to in the sentence, a point to which we return below).

(24)     John decided a week ago that in ten days at breakfast he would say to his mother that they were having their last meal together (cited in Abusch 1997, after Kamp and Rohrer 1983).

Moreover, Bar-Lev (2014) has recently argued that an absolute account of the past tense that assumes the ULC has a problem with quantified examples like (25):

(25)     Every doctor said Mary was pregnant.

Bar-Lev observes that (25) is judged to be true if either all the doctors said "Mary was pregnant" or they all said "Mary is pregnant"; but not if some of them said "Mary was pregnant" and some said "Mary is pregnant". That is, (25) does not have a "mixed reading". However, it not clear how an absolute account of the past tense that assumes the ULC could rule out the mixed reading, since such a reading is in accordance with the ULC. In contrast, a relative past tense account could rule out the mixed reading and, crucially, such an account need not assume the ULC.

In what follows, we would like to outline how a relative past tense account could also explain the other data considered in this section, without needing to posit the ULC. The crux of the analysis is

that the past tense locates the described event prior to the local evaluation time. This straightforwardly rules out (22), where the pregnancy is understood to hold after John's now, and it explains why (17) could not be used to report John saying (20). Moreover, we could explain (23) by saying, following Altshuler and Schwarzschild 2013, that the meaning of the past tense (like the present) involves quantification with time concepts being domain restrictors. The idea would be, then, that the anaphora in (23) does not involve *de re* pasts, but rather the sharing of contextually restricted time concepts.

The one potential problem with this relative tense account is that it does not seem to account for the correlation between (17) and (19). There are two possible ways to go here. If one makes the aforementioned assumption that (17) is ambiguous (i.e. it has two truth-conditionally distinct readings corresponding to whether it is used as a report of (18) or (19)), then one could, in addition, assume that there is a Sequence of Tense (SOT) rule which ensures that the embedded past tense is interpreted as a present tense.[8] That is, there is a rule that optionally applies to reports like (17) and the particular reading is derivative of whether the rule applies.

Another possibility is to deny the assumption that (17) is ambiguous; the only reading of a report like (17) is one in which the pregnancy held prior to John's now. This is the conclusion defended by Altshuler and Schwarzschild (2012), who claim that no sound arguments have been made in favor of an ambiguity treatment of (17). In fact, they claim that any argument for an ambiguity treatment of (17) would be committed to some unnatural auxiliary assumptions about the nature of states and stative predication. In explaining the correlation between (17) and (19), Altshuler and Schwarzschild first ask why a speaker would not use an embedded present tense if they wanted to give a report of John saying (19). Subsequently, they answer this question by claiming (ibid: 55): "The problem is that the English PRES is indexical. Were it not, PRES would have been the resource to use here and indeed, in other languages such as Hebrew, it is used for this purpose. Speakers of English are aware of this deficit and can take it into account when interpreting these utterances." They conclude that it is perhaps this compensation, which they cash out in terms of a scalar implicature (present in some uses of (17) but not others), that encourages the idea that there are two truth-conditionally distinct readings of (17).

Regardless of which analysis is the correct one (i.e. one that posits an SOT rule or one that does not), the crucial point here is that there are plausible relative tense accounts which can explain the data in this section without positing the ULC. We end this section by noting recent arguments that the ULC is empirically inadequate to begin with. The first argument of this sort (that we know of) comes from Altshuler and Schwarzschild 2013. They consider uses of a true *de re* present in the following interaction at the Air Berlin baggage counter:

(26)     a.     Customer: I believe you have my bags.

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[8]This idea goes back to at least Jespersen 1924, and has had many formulations over the years; see Grønn and von Stechow 2010; to appear, Ogihara and Sharvit 2012, Bar-Lev 2014 and Klecha 2014 for recent overviews.

b.    Employee: Who said I have your bags?
c.    Customer: The stewardess told me you have my bags.
d.    Employee: When did she tell you that?
e.    Customer: On the flight.

In a typical *de re* fashion, the customer uses the present tensed verb *have* in (26c) to speak about a time that is present from his and the employee's perspective, but would have been future from the stewardess' perspective. The bag-having is future relative to the local evaluation time set by *told*, thereby violating the ULC.

While it is unclear how Altshuler and Schwarzschild's analysis could account for this use of the *de re* present, what is clear is that it provides strong argumentation against the ULC. We return to this example in the conclusion, where we compare it to instances of the historical present in the complement of an attitude verb.

Klecha (2014) provides further evidence against the ULC, involving the future oriented attitudes *hope* and *pray*. The following examples, cited by Klecha, come from the Corpus of Contemporary American English (Davies 2008).

(27)    But none of that has put Singh in the headlines like his comments after finishing second at the Wachovia Championship in Charlotte, two weeks before the Colonial.  He said Sorenstam had no business playing the PGA Tour, **he hoped she missed the cut**  and he'd withdraw if paired with her, the AP reported.

(28)    He was going to find that Guardian and do what he had to do.  But his gut dropped at the thought of killing anyone in cold blood, even to save his brother. **He hoped she tried to kill him first**. Then he could behead her with a clean conscience.

(29)    "There were times when I picked one receiver and **prayed he got open**," recalled Collins, who completed 49.4 percent of his passes as a rookie out of Penn State, and finished with a quarterback rating of 61.9. "If he got open great; If not, I took the sack or threw it away."

(30)    Thirteen months and she would legally be able to walk out the door and live on her own. Her trust fund would be hers.  She would no longer be dependent on her mother and Victor.  Thirteen months. **She prayed she survived that long**.  It wasn't that she was worried about Victor killing her. She feared her own hand.

In all these examples, the event described by the clause embedded under *hope* and *pray* respectively is understood to be located after the attitude holder's now, thereby violating the ULC. Interestingly,

Klecha concludes based on these data that "the ULC is actually a 'lexically' sensitive constraint, or more precisely, it is sensitive to the kind of modal base a modal quantifies over (which may vary between or within modal lexical items)." In particular, Klecha assumes that all attitude verbs are modal expressions, whose temporal orientation is dependent on their modal base: epistemic or circumstantial. Attitudes like *hope* and *pray* can take either modal base (thereby allowing a wide range of readings) and it is when they take a circumstantial base that a forward shifted reading results. In contrast, attitudes like *think* and *believe* do not take a circumstantial base, and are therefore are incompatible with forward shifting.

While remaining neutral with respect to Klecha's analysis, we would like to point out that if, in fact, the ULC follows from the the semantics of particular attitude verbs, then we have more reason to believe that our revision of the initial **HEIM** constraint is harmless.[9]

## 6. Conclusion

Based on a particular mistaken-time scenario, this paper proposed an amendment to Heim's (1994) constraints. The amendment involved abandoning the Upper Limit Constraint, a move which we showed to follow from the semantics of the present tense. We discussed the consequences of giving up the Upper Limit Constraint and concluded that this is probably the right way to go. In this discussion, we noted a particularly striking case (viz. (26c)) in which a present tense is embedded under a past attitude and is interpreted *de re*. As such, there is no double access; it only has an absolute interpretation. Interestingly, there are also cases in which an embedded present tense get a purely relative interpretation when embedded under past:[10]

(31)  We're standing around sipping cokes and talking about the election. Slowly, one by one, folks are walking away from me. And then **I realized that once again I'm being argumentative**. Sheila is right. It turns people off.

(32)  Everyone was looking at us funny. I couldnt understand it. Then Paula came up to us, with horror in her eyes. **She whispered in my ear that we're in a room full of anti-communists and my wife's coat is bright red.**

(33)  David walked in and just stood by the door. I was puzzled by his behavior. Then **I thought that he just doesn't recognize me**. So I went over and said hello.

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[9]Some potential evidence for Klecha's analysis is that (26c) involves the verb *tell*, which patterns with *hope* and *pray* in taking a circumstantial modal base. The problem, however, is that a future-shifted interpretation of *The stewardess told me you have my bags* seems only possible if the present tense is interpreted *de re*. This seems to be the key difference between (26c) and Klecha's corpus examples above.

[10]These examples are due to Roger Schwarzschild (p.c.). They have been slightly altered to include a wider range of attitude predicates.

In sum, it seems to be the case that when a present tense is embedded under a past attitude, there are three possible interpretations. One is the double access interpretation, which is what this paper attempted to analyze. However, a satisfactory account of the present tense also needs to account for the purely absolute interpretation in examples like (26c), as well as for the purely relative interpretation like in the examples above. We believe that a better understanding of *perspective* is necessary to account for these kind of examples. In particular, the phenomenon of temporal *de re* for the former kind of examples, and the historical present for the latter kind.

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