Squibs and Discussion

Bound Tense in Relative Clauses: Evidence from VP-Ellipsis

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1 Introduction

We discuss lessons from VP-ellipsis about tense embedding (TE). We begin by portraying two possible views of relative clause TE (RC-TE): one that derives simultaneous readings only by coreference, and another that derives them by binding (section 2). We show data from VP-ellipsis, inspired by Stowell 2014, that support the binding view (section 3), and later review an argument that has been made against it (section 4). The argument is based on the behavior of so-called defective modals in TE and was articulated by Abusch (1994) and von Stechow (1995). In our evaluation of Abusch's/von Stechow's argument, we will claim that their conclusion about RC-TE was unwarranted, and that their data can be explained independently of the RC-TE binding question. Nevertheless, we draw attention to another potential challenge to binding accounts of RC-TE simultaneity, leaving the question unresolved (section 5). We conclude and discuss other remaining issues in section 6.

2 Tense Embedding and Simultaneity

2.1 Background

To begin, consider the example of RC-TE in (1).

(1) John worked for a man who sold bibles. (RC-TE)

(1) allows at least two readings, back-shifted and simultaneous. The two readings share the requirement that John's employment precede utterance time, but they differ on when, relative to that employment,

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John's boss is understood to have sold bibles. On the back-shifted reading, the bible-selling precedes the (already anterior) employment; on the simultaneous reading, they are contemporaneous.[1]

There are several ways of thinking about (1)'s apparent ambiguity, but for reasons of space we restrict our review to (sketches of) two perspectives. Before we discuss them, we take a moment to lay out our principal theoretical assumptions. We must emphasize that these assumptions are not part of a novel system that we wish to propose. We use them simply to clarify our description of the relevant problems, and possible solutions.[2]

First, we adopt a pronominal treatment of tense (Partee 1973, among others) and assume representations where tense morphemes are indexed. The indices are mapped contextually to time intervals, but only if the interval satisfies the requirements of the tense morpheme. For example, $\textsc{past}_i$ is mapped to $g(i)$ provided that $g(i)$ precedes the local time of evaluation; $\textsc{past}_i$ is otherwise undefined (see Heim 1994).

(2) $[\![\textbf{PAST}_i]\!]^{g,w,t} = g(i)$ only if $g(i) < t$; undefined otherwise

Second, we add an unusual (though innocuous) semantic rule that composes nodes of the form [$\textbf{T}_i$ **S**], that is, nodes that have a tense morpheme as one daughter and a node of type t as the other. The rule's output is $[\![\textbf{S}]\!]^{[\![\textbf{T}_i]\!]}$, that is, the interpretation of node **S**, but with the denotation of its sister node **T** as the time parameter. We call this rule *Tense Anchoring*.

(3) *Tense Anchoring (TA)*[3]
For any node [$\textbf{T}_i$ **S**], where $\textbf{T}_i$ is a tense morpheme and **S** a node of type t, $[\![\textbf{T}_i\ \textbf{S}]\!]^{g,w,t} = [\![\textbf{S}]\!]^{g,w,[\![\textbf{T}_i]\!]^{g,t}}$—more compactly: $[\![\textbf{T}_i\ \textbf{S}]\!]^{w,t} = [\![\textbf{S}]\!]^{w,i}$.

As a simple example, we show the composition of the sentence *John sold bibles* in (4); w_0 is the evaluation world and u is the utterance time. We abbreviate $g(i)$ as i from now on.

(4) $[\![\textbf{PAST}_i\ \textbf{John sell bibles}]\!]^{w_0,u}$
$= [\![\textbf{John sell bibles}]\!]^{w_0,[\![\textbf{PAST}_i]\!]^u}$
$= [\![\textbf{John sell bibles}]\!]^{w_0,i}$ as long as $i<u$

We now return to (1). Our main concern in this squib is simultaneity in RC-TE, and specifically whether binding might be one of its

[1] (1) also allows a forward-shifted reading. We mostly ignore it here as it is not relevant for our discussion.

[2] For more representative reviews of the literature, see Stowell 2007, Ogihara 2011, Ogihara and Sharvit 2012, Sharvit to appear, and references therein.

[3] Note that the effect of TA can be achieved without it; we can assume an optional type-lifting of tense pronouns ($s \Rightarrow \langle st,t\rangle$), and the lift, together with Intensional Functional Application (IFA), reproduces TA.

possible sources. For this reason, we will describe with minimal detail the kind of view that derives simultaneity in RC-TE simply from coreference (between, for example, the two occurrences of PAST in (1)), and we contrast it with the kind of view that allows simultaneity to result from binding as well.

2.2 Simultaneity by Coreference

Consider the following logical form (LF) for (1):

(5) [PAST$_i$ [J work for [a man who$_{\lambda y}$ [PAST$_{\#i/j}$ [t_y sell bibles]]]]]

In (5), the two occurrences of PAST stand in a c-command relation. This (as the reader can verify) has consequences for how the two morphemes may be indexed: the higher PAST requires that *i* precede *u*, and by TA, the rest of the LF (including the lower PAST) is interpreted relative to *i*. The lower PAST, in turn, has an anteriority requirement of its own: namely, that *its* index precede the temporal parameter *i*. Therefore, the lower PAST cannot carry index *i* (as *i* cannot precede itself), and its index (call it *j*) must point to an earlier temporal interval than the higher *i*. The LF (5) is therefore unambiguously back-shifted.

But (5) is not the only LF that sentence (1) can have. Coindexation, and therefore simultaneity, *can* result if the DP that hosts the RC is interpreted above the matrix PAST.

(6) [[a man who$_{\lambda y}$ [PAST$_{i/j}$ [t_y sell bibles]]] λx [PAST$_i$ [J work for t_x]]]

In (6), neither occurrence of PAST is in the scope of the other, so no anteriority needs to hold between their referents. When the two morphemes are coindexed, we derive the simultaneous reading, and when they are counterindexed, we derive the back-shifted or the forward-shifted reading, depending on how the indices are ordered relative to one another.[4]

2.3 Simultaneity by Binding

Our presentation of binding accounts of simultaneity is based on von Stechow 1995 and Kratzer 1998. The two main ingredients are (a) ''zero tense'' and (b) feature deletion.

By zero tense, we mean a vacuous index (∅) that accompanies ordinary tense morphology: ∅ is ''vacuous'' in that it refers to the temporal parameter used in its interpretation.

[4] We must note that Quantifier Raising (QR) is not the only way of pulling one embedded tense out of the scope of another. One could alternatively enrich the pronominal entry on each tense, assigning not only a ''referring'' index but also a perspective index (see, e.g., Kusumoto 2005, Ogihara and Sharvit 2012).

(7) $[\![\textsc{t}_{\varnothing}]\!]^{w,t} = t$, provided that the requirements of T (the tense morpheme) are met.

Note that, on current assumptions, $\textsc{past}_{\varnothing}$ cannot possibly have an interpretation: by the semantics of PAST, $[\![\textsc{past}_{\varnothing}]\!]^{w,t}$ must precede t, but by the semantics of $\varnothing$, $[\![\textsc{past}_{\varnothing}]\!]^{w,t}$ is t itself. This brings us to our second ingredient. Following Ogihara (1989, 1996), von Stechow posits a morphosyntactic rule that deletes the features on a tense morpheme when it is locally c-commanded by another instance of the same morpheme.

(8) *Sequence-of-tense (SOT) rule*[5]
$[\textsc{t}_1\ [\ \ldots\ \textsc{t}_2\ \ldots\ ]] \Rightarrow [\textsc{t}_1\ [\ \ldots\ \sout{\textsc{t}_2}\ \ldots\ ]]$, *optionally*, if $\textsc{t}_1$ and $\textsc{t}_2$ are instances of the same tense morpheme, and no other tense morpheme $\textsc{t}_3$ c-commands $\textsc{t}_2$ and is c-commanded by $\textsc{t}_1$.

The SOT rule produces the following LF:

(9) $[\textsc{past}_i$ [J work for [a man who$_{\lambda y}$ [$\sout{\textsc{past}}_{\varnothing}$ [t_y sell bibles]]]]]

With (9) as a possible LF for (1), we now have yet another way of deriving (1)'s simultaneous reading: the bible-selling is anchored to a ''fake'' tense $\varnothing$, and the fake tense is bound by the matrix $\textsc{past}_i$, that is, the time of John's employment.

These are our summaries of the first two accounts of RC-TE: on one of them, simultaneity is a product of coreference; on the other, it results (also) from binding. In the next section we present an argument from VP-ellipsis that supports the binding view, and in section 4 we describe (and critique) Abusch's/von Stechow's argument against it.

3 In Favor of Binding in RC-TE: VP-Ellipsis

Although the exact conditions on VP-ellipsis are not fully understood, and semantic as well as syntactic factors are thought to be at play, for current purposes we will assume the following semantic-identity condition on VP-ellipsis:[6]

[5] Strictly speaking, we need not commit to a deletion rule. The binding account can be formulated with zero tenses that have no features, but that *inherit* features through a process of agreement. In this respect, zero tenses behave similarly to zero pronouns (see Kratzer 1998 for a more thorough discussion).

[6] We are aware that this condition is insufficient for a general theory of VP-ellipsis. This formulation suffices for our purposes, however, in part because our representation of binding—using zero pronouns—may not require rebinding-ready mechanisms along the lines proposed by, for example, Takahashi and Fox (2005). Moreover, as we later show, the interaction between RC-TE and VP-ellipsis resembles the interaction between pronoun interpretations and ellipsis. We are thus fairly confident that reformulations of (10), if motivated by the behavior of pronouns, will be applicable to tenses as well.

(10) *Condition on VP-ellipsis*
An elided VP_E must be semantically identical to a discourse-salient antecedent VP_A, where VP_E and VP_A are semantically identical if and only if for any combination of interpretational parameters g,w,t, $[\![\mathbf{VP_E}]\!]^{g,w,t} = [\![\mathbf{VP_A}]\!]^{g,w,t}$.

3.1 VP-Ellipsis and Doubly Simultaneous Readings

Our argument in this section is inspired by Stowell 2014. Consider the elliptical example in (11), with (10) as background. (See also Stone and Hardt 1999.)

(11) John works for a man who sells bibles. His grandfather did too.

(11) can be understood to say that John now works for a man who (now) sells bibles, and that his grandfather in the past worked for a man who *then* sold bibles. We will call this reading *doubly simultaneous*, since both clauses that make up the example take the simultaneous reading, but each clause is anchored to a different time (present and anterior in (11)). Now, if we assume the identity condition in (10), then the missing VP in (11) must have the same interpretation as the VP *work for a man who sells bibles*, which contains an occurrence of the simple present. On the nonbinding view sketched above, this occurrence of PRES cannot be the realization of a zero tense, so the elided VP in (11) should mean that John's grandfather worked for a man who *now* sells bibles, and this is not the doubly simultaneous reading we want.[7] On the other hand, if RC-TE *does* license zero tenses, then we expect LFs like (12) to be licit, and therefore predict (correctly) that (11) has the doubly simultaneous reading.

(12) John PRES work for a man who ~~PRES~~$_{\varnothing}$ sell bibles
His grandfather PAST (did) ⟨work for a man who ∅ sell bibles⟩ too

Below we provide more examples that illustrate the same point. (13a) is similar to (11), but here the antecedent VP is embedded under PAST, not PRES, and the elided VP is embedded under PRES. Double simultaneity is available in this case also; the sentence can mean that John worked for a bible salesman and that his son now works for a bible salesman.

(13) a. John worked for a man who sold bibles. (And now) his son does.
b. John PAST [work for a man who ∅ sell bibles]
His son (does) PRES ⟨work for a man who ∅ sell bibles⟩

[7] In English, PRES is ''absolute''; under PAST in RC-TE, it is fixed to utterance time (for discussion, see Ogihara 1996 and Ogihara and Sharvit 2012). For example, (i) is false at *u* if John's ex-boss does not sell bibles at *u*.

(i) John worked for a man who sells bibles.

Here is another example. The sentence in (14) is felicitous only if a doubly simultaneous reading is assumed, since otherwise, the occurrence of PRES inside the elided VP requires that former Europeans be alarmed by *current* fascist trends (a similar problem arises if the indefinite *political campaigns* . . . is interpreted above matrix tense).

(14) Many Americans are alarmed by political campaigns that promote fascism. In the thirties many Europeans were too.

And once again, we find the same ''sloppy'' reading if we reverse PAST and PRES.

(15) In the thirties, many Europeans were alarmed by campaigns that promoted fascism. And these days many Americans are.

In the next section, we expand on this paradigm and show that these doubly simultaneous readings follow patterns that match those of sloppy readings of pronouns. We take this to strengthen the possibility that, whatever binding mechanism underlies sloppy interpretations of pronouns under VP-ellipsis, a very similar mechanism produces the doubly simultaneous readings shown above.

3.2 Two Constraints on Sloppy Readings and Doubly Simultaneous Readings

It is well-known that sloppy readings of elided personal pronouns are constrained. Analyzing double simultaneity (as we have done) as resulting from binding should in principle be subject to constraints similar to those that limit the range of sloppy identity for pronouns. In this section, we confirm this with two kinds of data, both blocking sloppy readings of personal pronouns and (in parallel) blocking doubly simultaneous readings of RC-TE. The comparison is intended to show that simultaneity does not result from a relaxation of the ellipsis constraint, but seems to conform to generalizations that are familiar from pronoun ellipsis.

3.2.1 Witten's Paradigm Our first example concerns a contrast between elided personal pronouns and demonstrative DPs. In designing this example, we draw on an asymmetry between pronouns and proper names in permitting sloppy readings (Witten 1970). To see this, observe first that in (16), the referent *i* can be thought by *i*'s mother to be the smartest in *i*'s class, and *Bill* can be thought by Bill's mother to be the smartest (the sloppy reading is possible with a pronominal antecedent).

(16) His$_i$ mother thinks he is the smartest in the class. And Bill's mother does too.

Note that *his*/*Bill* does not c-command into the VP here, so it is not clear what the relevant binding relation needs to be in order for the sloppy reading to come out (this will come up again in section 6). But for now, this lack of c-command is not relevant. What matters is that

this sloppy reading, wherever it comes from, is absent from the minimally different (17), where the VP includes a name instead of a pronoun. Assuming that *his* is used deictically to refer to John, (17) can have the strict reading, where Bill's mother thinks that *John* is the smartest, but not the sloppy reading where she thinks that *Bill* is the smartest (the sloppy reading is not possible with a proper name antecedent).

(17) His$_j$ mother thinks John is the smartest in the class. And Bill's mother does too.

We are interested in testing this on RC-TE, but because of the difficulty in finding tense ''names,'' we will show first that Witten's findings do not change when the antecedent is a demonstrative instead of a name; see (18).

(18) His$_i$ mother thinks that this boy$_i$ is the smartest in the class. And Bill's mother does too. (*sloppy)

We conclude, on the basis of (16)–(18), that antecedent VPs containing pronouns allow sloppy readings of ensuing elided VPs, but antecedent VPs containing names or demonstratives do not. We now show a similar block on doubly simultaneous readings in RC-TE. Consider the discourse in (19).

(19) John works for the channel that broadcasts the presidential debates. Twelve years ago, Bill did too.

The speakers we consulted allow a reading of (19) where John's company and Bill's company are different. If right, this means that (19) permits the doubly simultaneous reading, as expected given our previous examples. Crucially, however, adding a demonstrative in the antecedent VP, as in (20)–(21), blocks double simultaneity (unless the company is understood to be the same, in which case the referent of the objects in both VPs would be identical and would thus satisfy the condition on ellipsis).

(20) John works for the channel that broadcasts this year's presidential debates. Twelve years ago, Bill did too.

(21) John works for the channel that broadcasts the presidential debates this year. Twelve years ago, Bill did too.

The interference of demonstratives in (20)–(21) parallels that in (18), showing a similarity between the distribution of sloppy readings of pronouns and the distribution of doubly simultaneous readings in RC-TE.

3.2.2 Dahl's Paradigm Our second group of cases exemplifies what is known as Dahl's Puzzle (Dahl 1973). The judgment reported in the literature is that cases like (22), where the antecedent VP contains two potential bindees, allow only three of the four logically possible readings: sloppy-sloppy, strict-strict, and sloppy-strict; strict-sloppy is disallowed.

(22) Al thinks that he is doing everything for his kids. Ed does too.
a. Ed does ⟨think ED is doing everything for ED's kids⟩ ✓(sloppy-sloppy)
b. Ed does ⟨think AL is doing everything for AL's kids⟩ ✓(strict-strict)
c. Ed does ⟨think ED is doing everything for AL's kids⟩ ✓(sloppy-strict)
d. Ed does ⟨think AL is doing everything for ED's kids⟩ *(strict-sloppy)

While we remain agnostic about exactly what explains the pattern in (22), we point out that an analogous paradigm is found for double simultaneity. In (23)–(24), simultaneity in the elided clause cannot hold between the matrix (binding) tense and the deepest tense morpheme, unless it also includes the intermediate tense morpheme. In the right margins below, we use *sim* to indicate simultaneity with the embedding tense binder, and *non* to indicate nonsimultaneity.

(23) Al thought that Sue was hiring actors who were famous. Now Ed does.
a. Ed does ⟨think that Sue IS hiring actors who ARE famous⟩ (sim-sim)
b. Ed does ⟨think that Sue WAS hiring actors who WERE famous⟩ (non-non)
c. Ed does ⟨think that Sue IS hiring actors who WERE famous⟩ (sim-non)
d. *Ed does ⟨think that Sue WAS hiring actors who ARE famous⟩ (non-sim)

Both (23a) and (23b) are possible readings of the elided VP in (23). (23c) is also available—for example, if both Al and Ed think that Sue makes shows about ''has-beens,'' Al having thought this in the past, and Ed thinking it in the present. However, there seems to be no context that makes reading (23d) available, in parallel with the absence of the strict-sloppy reading for elided pronouns. A similar effect is seen in (24).

(24) Al thought that Sue lived in a city where smoking was illegal. Now Ed does.
a. Ed does ⟨think that Sue LIVES in a city where smoking IS illegal⟩ (sim-sim)
b. Ed does ⟨think that Sue LIVED in a city where smoking WAS illegal⟩ (non-non)
c. Ed does ⟨think that Sue LIVES in a city where smoking WAS illegal⟩ (sim-non)
d. *Ed does ⟨think that Sue LIVED in a city where smoking IS illegal⟩ (non-sim)

Our point in discussing these Dahl-like examples (and the Witten-like ones) is to show that what we took to suggest tense binding appears to resemble familiar cases of (and constraints on) pronoun binding, as demonstrated by sloppy readings of VP-ellipsis.

4 Against Binding in RC-TE: *Ought*, and a Reassessment

As mentioned in section 1, Abusch (1994) and von Stechow (1995) (A/vS) have argued that simultaneity in RC-TE cannot come from binding. To understand the argument, we need to compare the behavior of RC-TE with that of AV(attitude verb)-TE. Consider (25).

(25) John believed that Mary sold bibles.

Like the RC-TE example in (1), (25) allows a simultaneous and a back-shifted reading. With the simultaneous reading in mind, consider the two LFs in (26).

(26) a. [PAST$_i$ J believe [PAST$_i$ M sell bibles]] (coreference?)
b. [PAST$_i$ J believe [~~PAST~~$_\varnothing$ M sell bibles]] (binding)

On current assumptions, (26a) is predicted to be inconsistent: as we showed earlier, if an occurrence of PAST c-commands another coindexed PAST, the resulting truth conditions will not be satisfiable. When we noted this problem in RC-TE, we also pointed out that QR can make coindexation possible (recall (6), and recall also that QR is not the only way of achieving transparency for tense). Here, however, a transparent interpretation of the embedded tense pronoun (e.g., via QR) not only is unlikely, but also, as von Stechow points out, produces incorrect truth conditions: the resulting reading requires that at some earlier time *i*, John believe that *at i* Mary sell bibles. But Mary's bible-selling is not thought (by John) to take place at *i*; it is thought to take place at John's *perceived present* at *i*. The temporal location of the embedded proposition should therefore be bound not to the matrix tense but to the attitude holder's ''now'' at the time denoted by it. This desired reading is exactly what results from LF (26b).

(27) $[\![\textbf{believe}]\!]^{w,t}$
$= [\lambda p_{\langle s\times s,t\rangle} . \lambda x_e . \text{BEL}_{x,w,t} \subseteq \{\langle w', t'\rangle : p(w', t') = 1\}]$

(28) $[\![\text{PAST}_i \textbf{ J believe [}\sout{\text{PAST}}_\varnothing \textbf{ M sell bibles]}]\!]^{w,u}$
$= [\![\textbf{J believe [}\sout{\text{PAST}}_\varnothing \textbf{ M sell bibles]}]\!]^{w,i}$
(by TA; $i<u$ by PAST)
$= [\![\textbf{believe}]\!]^{w,i}([\lambda\langle w',t'\rangle.[\![\sout{\text{PAST}}_\varnothing \textbf{ M sell bibles}]\!]^{w',t'}])\ ([\![\textbf{J}]\!])$
(by IFA)
$= [\![\textbf{believe}]\!]^{w,i}([\lambda\langle w',t'\rangle.[\![\textbf{M sell bibles}]\!]^{w',t'}])([\![\textbf{J}]\!])$
(by TA and def. of $\varnothing$)
$= 1$ iff $\text{BEL}_{j,w,i}\subseteq\{\langle w',t'\rangle : [\![\textbf{M sell bibles}]\!]^{w',t'} = 1\}$

To A/vS, this means that only zero tenses can appear in the scope of intensional predicates.[8] But A/vS go further and ask whether inten-

[8] One may wonder how back-shifting in AV-TE can be derived with zero tenses. Setting details aside (given that our main concern is simultaneity), one possibility is to add a nonpronominal, quantificational entry for PAST (see, e.g., Ogihara 2011), which in an intensional context existentially introduces an anterior time that verifies the embedded proposition. Another (due to Kratzer) is to derive back-shifting through embedded aspect operators.

sional embedding is the *sole* licenser of tense binding. We will now show why they conclude that the answer is yes.

The contrast that distinguishes AV-TE from RC-TE, to A/vS, is exemplified in (29).

(29) a. John believed that Mary ought to study hard. (✓sim)
b. John had a student who ought to study hard. (*sim)

(29a) reportedly allows for a simultaneous reading that is similar to (25)'s: at some earlier interval *i*, John believed that *at his perceived present* Mary needed to study. The availability of this reading suggests that *ought* has a ''zero'' temporal index, and by the same derivation as in (28) that zero index will make the simultaneous reading of (29a) possible. Similar facts hold of other modals, such as *should* and *might*.

(30) a. John thought that Mary should go to the dentist. (✓sim)
b. John thought that Bill might be at home. (✓sim)

But (the argument goes) if zero-tense binding were possible in RC-TE, then examples like (29b) should give rise to simultaneity, in the same way as in (29a) and (30), mutatis mutandis. But (29b) does not allow a simultaneous reading, leading A/vS to conclude that zero tenses cannot be bound in RC-TE.

However, we believe that the asymmetry in (29) can be due to a lexical property of *ought* itself (and similar modals), rather than a difference in the distribution of zero tense or tense binding. We see two ways of expanding on this. One possibility is that *ought* has both a subjunctive and an indicative use. Subjunctive *ought* appears only in intensional environments (e.g., under AVs), and it has a zero-tense argument. Indicative *ought* is licensed outside the scope of AVs, but its temporal location is always fixed to utterance time (like PRES). This proposal, though far from fully developed, provides a way of capturing the AV/RC-TE difference: in AV-TE, an embedded *ought* (which may be subjunctive) tolerates simultaneity with an embedding PAST, because its zero-tense argument is anchored within the embedded proposition (recall (29a)); in RC-TE, only indicative *ought* is licensed, and for this reason sentences like (29b) do not permit past-shifting. Another, more principled explanation is that *ought*'s temporal anchor is *perspectival* and can be ''bound'' only to the temporal anchor of a logophoric center. When *ought* appears in the scope of an AV, the attitude holder's ''now'' serves as binder, but in the absence of an AV, as in the RC-TE (29b), only the speaker's ''now'' (utterance time) may fix *ought*'s time argument.[9]

[9] Indeed, von Stechow himself discusses a perspectival analysis of *ought* in later work (von Stechow 2002), though he does not consider its implications for the RC-TE binding question.

Both of these possibilities are compatible with an account that licenses zero-tense binding in RC-TE. The proposal that emerges from this must therefore distinguish the mechanism that binds embedded tense morphemes in RC-TE from the one that assigns a temporal anchor to *ought* and its sister modals. We now turn to the data that keep us from arguing in favor of binding in RC-TE with full confidence.

5 Semantically Future PAST in RC-TE?

The following famous example (based on an example in Abusch 1997, and based in turn on Kamp and Rohrer 1984) shows that instances of morphological PAST may have denotations that *follow* utterance time, and that their presence requires a licensing PAST.

(31) A week ago, John said that in 10 days he would tell his mother that they **were** having their last meal together.

The boldfaced occurrence of PAST is clearly not intended to refer to a prior interval: the reported last meal is anchored to a time that follows utterance time, and also follows John's perceived present at the time of his saying.

According to Abusch-style theories of tense, (31) is acceptable because of the PAST marking on the AV *say* and the licensed PAST marking on *would*: the occurrence of PAST on *say* licenses the deletion of PAST features on *would*, which in turn licenses the deletion of PAST on *be having*. This is shown in the LF in (32).

(32) [PAST$_i$ John say [he ~~PAST~~$_\varnothing$ will tell his mother [~~PAST~~$_\varnothing$ [they be having . . .]]]]

Now, if the ''fake'' PAST in (31) is the realization of a zero tense, and if zero tenses are licensed across RC boundaries (as we have argued), we expect there to be well-formed analogues to (31) in which the zero tense is separated from its licensing PAST not by an AV, but by an RC boundary. But this is not obviously supported. Consider (33).

(33) (?)A week ago, John saw a car that was going to be on sale 10 days later at a show where the manufacturer **was** keen to display its recent models.

Judgments about (33) vary, in contrast to (31). If RC-TE constructions allowed zero-tense binding (as suggested by the VP-ellipsis facts), we would expect the LF in (34) to be well-formed, and therefore we would expect (33) to clearly allow an interpretation where the manufacturer's keenness is concurrent with the (future) car show.

(34) PAST$_i$ [John see a car [that ~~PAST~~$_\varnothing$ be going to be on sale . . . [~~PAST~~$_\varnothing$ be keen . . .]]]

From a binding point of view, the uncertain status of (34) is puzzling, and at the moment we leave it unsolved. However, we wish to point to a judgment that may suggest a possible explanation. It has been reported in the tense literature that *would* is constrained in its

forward-shifting capacity.[10] For example, the sentence in (35) requires the presidency to precede utterance time, which is unexpected if *will* simply quantifies over posterior time intervals.

(35) Mary met a man who would be/become president.

The importance of this is the following: by its design, sentence (33) has a semantically future (i.e., post-utterance) PAST marker on *be keen*. The observation about (35) is that the presidency cannot be post-utterance. It is possible, then, that the constraint responsible for the observation about (35) is at play in (33)—namely, in requiring both the car show and the concurrent keenness to precede utterance time. If this is right, it follows that (33) is not a true parallel to Abusch's (31), and therefore that its uncertain status does not tell us about the viability of a binding account of RC-TE simultaneity. Having said this, we suspect that *was going* and *would* have different properties that could break the connection between (35) and (33). If *would* and *was going* only embed pre-utterance events, we expect (36a) and (36b) to be equally unacceptable.

(36) a. (?)Yesterday, John saw a car that would go on sale 10 days later.
b. (?)Yesterday, John saw a car that was going on sale 10 days later.

From the judgments we have elicited, it is not yet clear whether (and how) these two sentences differ. If (36b) is clearly unacceptable, then we can conclude that (33) has an independent (if unclear) property that stops it from allowing the predicted simultaneity, which in turn shows that (33) does not in fact bear on the RC-TE binding question. If (36b) is not clearly unacceptable, (33) stands as a challenge to binding accounts of RC-TE.

6 Closing Remarks and Remaining Issues

We have used ellipsis data to show that embedded tenses, in RC-TE specifically, can have ''sloppy'' readings. We took this to show that binding between higher and lower tenses in RC-TE is needed, *pace* claims to the contrary by Abusch (1994) and von Stechow (1995).

Many unresolved issues remain. First, a VP in a PAST>PAST configuration can allow a back-shifted reading and serve as antecedent to an elided VP that also allows back-shifting. Importantly, the embedded tenses in these cases do not need to corefer.

(37) John lived in a town where Dutch settlers lived. Mary did too.

[10] See for example Heim 1994, citing personal communication with James Higginbotham. We thank Philippe Schlenker for discussion of this point.

(37) can be said truthfully even if John and Mary lived in different towns, and even if the two towns were inhabited by settlers at different times. On a pronominal approach, this means that the index in the antecedent VP must differ from that of the elided VP, thus failing semantic identity. Examples of this kind can be captured if PAST is also given a quantificational entry (see footnote 8), but we leave the details to another occasion.

Another issue is that our doubly simultaneous readings can be replicated in constructions where the zero tense is not c-commanded by its binder, as in (38).[11]

(38) The house Sue lives in was owned by a gangster who is serving a jail sentence.
The house Bill lived in was too.

The judgment here is subtle, but (38) seems to allow a reading where the time of Bill's stay (in the past) coincided with the jail term of the house's (ex) owner. This would be predicted if binding and deletion were possible from the boldfaced positions in (39), but on our current assumptions they are not.

(39) [The house **PRES** Sue live in] was [owned by a gangster who **PRES**$_{\varnothing}$-be serving a jail sentence]
[The house **PAST** Bill live in] was ⟨owned by a gangster who ∅-be serving a jail sentence⟩ too

We do not yet have an account of cases like (38), though we note that there is a parallel between them and cases of ''paycheck'' pronouns like the one in (40).

(40) People who live in London worry about its property prices.
People who live in New York City do too.

Here, the sloppy reading in the elided VP seems to be available, even though the name *London* does not c-command into the VP and therefore is not in a syntactic position to bind what one might analyze as a zero pronoun. This is parallel to the simultaneity that (38) allows, suggesting yet deeper connections between tenses and pronouns (in the spirit of Partee 1973, Kratzer 1998, and others). The case of (38) specifically motivates a serious consideration of a dynamic account of tenses (e.g., Kamp and Reyle 1993), or perhaps ''e-type'' accounts of bound pronouns (and here tenses), where bound variables are treated as abbreviated definite descriptions (e.g., Evans 1980). We leave this to future investigation.

Finally, we note that our main point against coreference accounts hinges on a particular theory of VP-ellipsis, which may be given an alternative dynamic analysis (e.g., Hardt 1999).[12] We leave it to future

[11] We thank Yasu Sudo for pointing this out to us.
[12] We owe this observation to an anonymous reviewer of WCCFL 34.

work to investigate how a theory like Hardt's may be used to account for our ellipsis facts, and whether the account might rid the framework of zero tenses/binding and instead derive ''sloppy'' readings using what Hardt calls ''center-shifting.''

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The Activity Condition as a Microparameter

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Using data from agreement in three Algonquian languages (Ojibwe, Cheyenne, and Plains Cree), this squib shows that effects typically attributed to Chomsky's (2000, 2001) Activity Condition (AC) can vary not only across languages, as in Baker's (2008b) macroparametric proposal, but within a language as well. AC effects are thus another instance in which an apparent macroparameter turns out, on closer inspection, to be a microparameter instead, as in prominent cases such as the pro-drop parameter and the polysynthesis parameter (Kayne 2005, Baker 2008a).

1 Introduction

The AC restricts Agree to goals that bear an unvalued feature, typically a Case feature. Once the Case feature of a goal G has been valued by Agree, G is *inactive* and cannot be targeted by subsequent Agree operations. Chomsky appears to treat the AC as an invariant principle of the faculty of language, but Baker (2008b, 2013) has shown that not all languages display AC effects. Some languages, such as Hindi,

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