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3/6 2008

Binding in complements of perception verbs

Outline

1. Long-distance reflexives are exceptionally allowed in complements of perception verbs
   → perception verbs have special properties in their complements

2. The complements of perception verbs are also exceptional in the domain of tense dependency
   [→ perception verbs have special properties in their complements]??

To avoid stating twice that perception verbs select special complements, we would want one to follow from the other

3. By employing recent approaches within minimalist syntax to reflexive binding and tense dependency, I will show that the property outlined in 1. can indeed follow from the property described in 2.

1. Long-distance binding

Binding Principle A: Reflexives are bound in their local domain
If a reflexive is bound from outside its local domain, we have *long-distance binding*.

Icelandic:
(1) Jón$_i$ segir að María elski sig$_i$
John says that Mary loves (subj.) self
'John$_i$ says that Mary loves him$_i$' (Sigurðsson 1990:310)

2. Norwegian reflexives

'Norwegian' here refers to my own local dialect (Askim, Østfold). My prime informants have been my two brothers (followed by my parents and other locals). Judgments have been given in pairwise comparisons.

Norwegian reflexives are all 3. person, and not specified for number or gender. Outside the 3. person, the regular pronouns serve as 'reflexives'.
Reflexives are *simple* (monomorphemic) or *complex*:

	Non-possessive reflexive	Possessive reflexive
Simple	*seg*	*sin*
Complex	*seg sjøl*	*sin egen*

2.1 Simple reflexive *seg*

1. *seg* is used after inherent reflexive verbs – verbs that cannot take any other complement than a reflexive:

(2) Han_i skammer seg_i
He shames self
'He is ashamed'

2. *seg* is used in PPs where the preposition denotes locational semantics (and in idioms) (Lødrup 2007):

(3) Han_i så en sky over seg_i
He saw a cloud over self
'He saw a cloud above himself'

3. *seg* can under strict conditions be bound long-distance (more on that later)

2.2 Complex reflexive *seg sjøl*

1. *seg sjøl* is used as the complement of a non-inherent reflexive verb

(4) Han_i kritiserte seg_i sjøl
He criticized self self
'He criticized himself'

2. *seg sjøl* is used in PPs where the preposition denotes non-locational semantics:

(5) Han_i lytta til seg_i sjøl
He listened to self self
'He listened to himself'

3. *seg sjøl* can replace *seg* in a PP with locational semantics (but not in idioms) for contrastive purposes

(6) Han_i så en sky over seg_i sjøl
He saw a cloud over self self
'He saw a cloud above *himself* (not above someone else)'

4. *seg sjøl* cannot be bound outside its local domain. When *seg* is bound long-distance, it is equivalent to both local *seg* and local *seg sjøl*

2.3 Possessive reflexives

sin, the 'possessive variant' of *seg*, undergoes fewer binding restrictions than *seg*. It is yet unclear how *sin* is distributed.

sin egen replaces *sin* for contrastive purposes.

3. Norwegian long-distance binding of *seg*

3.1 Previous literature

Facts about binding in Norwegian are generally taken from the works by Hellan (1988, 1991). Hellan claims that *seg* can be bound out of infinitival clauses, but not out of finite clauses. Investigations of Norwegian dialects, especially in the North-West, have shown that *seg* in some dialects can be bound out of finite clauses (Moshaugen/Trosterud 1990, Strahan 2003), but a general principle for the distribution in these dialects has either not been investigated or not been found.

3.2 Binding in complements of perception verbs

Most clause-selecting verbs do not allow their external argument to bind into their internal argument:

(7) *Per$_i$ sa at noen snakka om seg$_i$
Per said that someone talked about self
'Peter said that someone talked about him'

In the complement of a perception verb, binding of *seg* from outside its clause is markedly better, or even fully acceptable.[1]

(7a) *Per$_i$ sa at noen snakka om seg$_i$
Per said that someone talked about self
'Peter said that someone talked about him'

(7b) ?Per$_i$ hørte at noen snakka om seg$_i$
Per heard that someone talked about self
'Peter heard that someone talked about him'

(8a) *Han$_i$ ba noen kile seg$_i$
He asked someone tickle (inf.) self
'He asked someone to tickle him'

(8b) ?Han$_i$ kjente noen kile seg$_i$
He felt someone tickle (inf.) self
'He felt someone tickling him'

[1] The subject of the complement clause is in most cases *noen* 'someone' to avoid the effect of a nominal blocking effect that I'm abstracting away from here.

(9a) *Per$_i$ sa at noen stod bak seg$_i$
Per said that someone stood behind self
'Peter said that someone stood behind him'

(9b) ?Per$_i$ hørte at noen stod bak seg$_i$
Per heard that someone stood behind self
'Peter heard that someone stood behind him'

(10a) *Per$_i$ sa at noen la et håndkle rundt seg$_i$
Peter said that someone laid a towel around self
'Peter said that someone put a towel around him'

(10b) ?Per$_i$ kjente at noen la et håndkle rundt seg$_i$
Peter felt that someone laid a towel around self
'Peter felt that someone put a towel around him'

(11a) *Læreren$_i$ ba elevene stå bak seg$_i$
The-teacher told the-students stand (inf.) behind self
'The teacher told the students to stand behind him'

(11b) Læreren$_i$ så elevene stå bak seg$_i$
The-teacher saw the-students stand (inf.) behind self
'The teacher saw the students stand behind him'

(12a)[2] *Reven$_i$ sa at noen jakta på seg$_i$
The-fox said that someone chased on self
'The fox said that someone was chasing/hunting him'

(12b) *Reven$_i$ frykta at noen jakta på seg$_i$
The-fox feared that someone chased on self
'The fox feared that someone was chasing/hunting him'

(12c) ?Reven$_i$ lukta at noen jakta på seg$_i$
The-fox smelled that someone chased on self
'The fox smelled that someone was chasing/hunting him'

(12d) ?Reven$_i$ hørte at noen jakta på seg$_i$
The-fox heard that someone chased on self
'The fox heard that someone was chasing/hunting him'

(12e) ?Reven$_i$ så at noen jakta på seg$_i$
The-fox saw that someone chased on self
'The fox saw that someone was chasing/hunting him'

[2] A fairy tale setting is imagined in (12), where animals speak and think like humans.

3.3 Perception vs. factivity

A consistent difference between the perception and non-perception verbs in 3.2 is that the perception verbs are factives, whereas the other verbs are non-factives.

The following examples using the non-factive perception verb *drømme* 'dream', and the factive non-perception verbs *like* 'like, enjoy' and *være klar over* 'be aware' show that the crucial distinction is perception vs. non-perception, and not factives vs. non-factives.

(12a) *Reven$_i$ sa at noen jakta på seg$_i$
The-fox said that someone chased on self
'The fox said that someone was chasing/hunting him'

(12f) ?Reven$_i$ drømte at noen jakta på seg$_i$
The-fox dreamed that someone chased on self
'The fox dreamed that someone was chasing/hunting him'

(13a) *Hunden$_i$ trudde at noen leika med seg$_i$
The-dog believed that someone played with self
'The dog believed that someone was playing with him'

(13b) ?Hunden$_i$ drømte at noen leika med seg$_i$
The-dog dreamed that someone played with self
'The dog dreamed that someone was playing with him'

(14a) ??Per$_i$ likte at noen la et håndkle rundt seg$_i$
Peter liked that someone laid a towel around self
'Peter enjoyed that someone put a towel around him'

(14b) ?Per$_i$ kjente at noen la et håndkle rundt seg$_i$
Peter felt that someone laid a towel around self
'Peter felt that someone put a towel around him'

(15a) *Per$_i$ var klar over at noen stod bak seg$_i$
Peter was clear over that someone stood behind self
'Peter was aware that someone stood behind him'

(15b) ?Per$_i$ hørte at noen stod bak seg$_i$
Per heard that someone stood behind self
'Peter heard that someone stood behind him'

In conclusion, perception verbs are special in terms of the behavior of their complements. The next section shows that this applies in another domain too.

4. Perception verbs and tense dependency

4.1 Sequence of tense (SOT)

The temporal semantics of complement clauses show a greater dependency to the matrix clause than non-complement clauses:

(16) John said that Mary was pregnant
(17) John spoke to the man who was crying

In (17), the time of the man's crying is not related to John's speaking. In (16), however, Mary's pregnancy cannot follow John's statement.

In (16), Mary's pregnancy is either simultaneous or prior to John's statement. In the first case, the complement tense denotes simultaneity with the matrix tense, even though the morphological tense is *past* → 'sequence of tense' (SOT). In the latter case, we have a 'past-shifted' reading.

(16) John said that Mary was pregnant
(16a) John said: "Mary is pregnant" (Simultaneous reading)
(16b) John said: "Mary was pregnant" (Past-shifted reading)

Some languages do not exhibit SOT – Russian and Hebrew are the classic examples. 'Past under past' has a past-shifted reading:

Russian:
(18) John skazal chto Mary byla beremenna
John said that Mary was pregnant
(18a) *John said: "Mary is pregnant" (Simultaneous reading not available)
(18b) John said: "Mary was pregnant" (Past-shifted reading)

Hebrew:
(19) Dan amar she-Dina hayta be-herayon
Dan said that-Dina was in-pregnancy
(19a) *Dan said: "Dina is pregnant" (Simultaneous reading not available)
(19b) Dan said: "Dina was pregnant" (Past-shifted reading)

4.2 SOT in perception verb complements

In the complement of a perception verb, non-SOT languages like Russian and Hebrew nevertheless exhibit SOT (cf. Barentsen 1996, Sharvit 2003):

Russian:
(20) John uvidel chto Mary byla beremenna
John saw that Mary was pregnant
(20a) John saw: /Mary is pregnant/ (Simultaneous reading)
(20b) John saw: /Mary was pregnant/ (Past-shifted reading)

Hebrew:
(21) Dan ra'a she-Dina hayta be-herayon
Dan saw that-Dina was in-pregnancy
(21a) Dan saw: /Dina is pregnant/ (Simultaneous reading)
(21b) Dan saw: /Dina was pregnant/ (Past-shifted reading)

In Hebrew, the same SOT-effect arises in the complement of 'dream':

(22) Dan xalam she-Dina hayta be-herayon
Dan dreamed that-Dina was in-pregnancy
(22a) Dan dreamed: /Dina is pregnant/ (Simultaneous reading)
(22b) Dan dreamed: /Dina was pregnant/ (Past-shifted reading)

A similar effect is seen in Chinese, where the perfective marker *le* in a complement clause of a perception verb (cf. Lin 2003) and 'dream' does not induce a past-shifted reading:

(23) Zhangsan shuo Lisi chi le yi tiao she
Zhangsan say Lisi eat PERF. one CLASS. snake
(23a) *Zhangsan said: "Lisi eats a snake" (Simultaneous reading not available)
(23b) Zhangsan said: "Lisi ate a snake" (Past-shifted reading)

(24) Zhangsan kanjian Lisi chi le yi tiao she
Zhangsan see Lisi eat PERF. one CLASS. snake
(24a) Zhangsan saw: /Lisi eats a snake/ (Simultaneous reading)
(24b) *Zhangsan saw: /Lisi ate a snake/ (Past-shifted reading not available)

(25) Zhangsan mengdao Lisi chi le yi tiao she
Zhangsan dream Lisi eat PERF. one CLASS. snake
(25a) Zhangsan dreamed: /Lisi eats a snake/ (Simultaneous reading)
(25b) ?Zhangsan dreamed: /Lisi ate a snake/ (Past-shifted reading)

In English, SOT is normally only found in complements with a stative predicate, e.g. 'be pregnant', and not with eventive predicates:

(26) John said that Mary won the race
(26a) *John said: "Mary wins the race" (Simultaneous reading not available)
(26b) John said: "Mary won the race" (Past-shifted reading)

When the clause is the complement of a perception verb or 'dream', SOT extends to eventives (Partee in Kusumoto 1999, Giorgi and Pianesi 2001):

(27) John saw that Mary won the race
(27a) John saw: /Mary wins the race/ (Simultaneous reading)
(27b) John saw: /Mary won the race/ (Past-shifted reading)

(28) John dreamed that Mary won the race
(28a) John dreamed: /Mary wins the race/ (Simultaneous reading)
(28b) John dreamed: /Mary won the race/ (Past-shifted reading)

In Norwegian, SOT is the preferred reading in all complements. When embedded under a perception verb or 'dream', SOT becomes the *only* available reading, regardless whether the predicate is eventive or stative:

(29) Per sa at Kari åt ei pølse
Peter said that Kate ate a sausage
(29a) Peter said: "Kate eats a sausage" (Simultaneous reading)
(29b) Peter said: "Kate ate a sausage" (Past-shifted reading)

(30) Per så at Kari åt ei pølse
Peter saw that Kate ate a sausage
(30a) Peter saw: /Kate eats a sausage/ (Simultaneous reading)
(30b) *Peter saw: /Kate ate a sausage/ (Past-shifted reading not available)

(31) Per så at Kari var med barn
Peter saw that Kate was with child
(31a) Peter saw: /Kate is pregnant/ (Simultaneous reading)
(31b) *Peter saw: /Kate was pregnant/ (Past-shifted reading not available)

(32) Per drømte at Kari åt ei pølse
Peter dreamed that Kate ate a sausage
(32a) Peter dreamed: /Kate eats a sausage/ (Simultaneous reading)
(32b) *Peter dreamed: /Kate ate a sausage/ (Past-shifted reading not available)

(33) Per drømte at Kari var med barn
Peter dreamed that Kate was with child
(33a) Peter dreamed: /Kate is pregnant/ (Simultaneous reading)
(33b) *Peter dreamed: /Kate was pregnant/ (Past-shifted reading not available)

4.3 Perception verbs and tense dependency – a reasoning

The nature of direct perception dictates that the object of direct perception is simultaneous with the perception itself. Humans cannot directly perceive the past or the future. Partee (in Lin 2003) suggests that the special behavior of perception verbs is a cognitive, and not a linguistic effect. Given recent human advancement, it seems rather that the special behavior of perception verbs has been grammatically encoded.

(34) John saw Sirius A explode

Sirius A is more than 8 light years away from us. We cognitively understand that the explosion in (34) is prior to the seeing, but the grammar doesn't allow such a relation to be expressed.

5. The generalization

Perception verbs create a tense dependency in their complements. In Norwegian, where anything but a full tense dependency is excluded, the complements show a similar dependency with respect to the interpretation of pronominal elements.

In complements of perception verbs, both anaphoric pronouns and anaphoric tense can be licensed – both receiving their interpretation from the higher clause.

This supports the often noted similarity between tenses and pronouns.

An implementation:

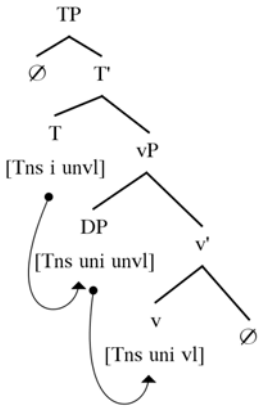
6. The syntax of binding (Reuland 2001, 2005)

Pesetsky/Torrego 2001, 2004, 2007:

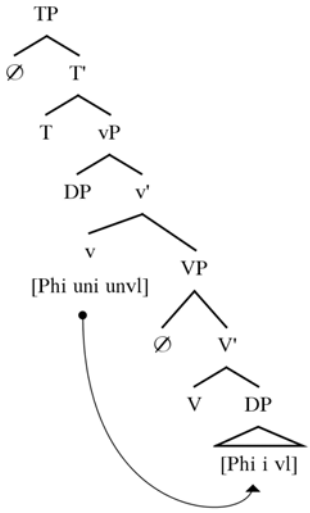
- valued/unvalued and interpretable/uninterpretable are independent
- two unvalued instances of a feature can agree
- agreement: a feature is shared by several *instances* of that feature

An Agree relation between features forms an agreement *chain*

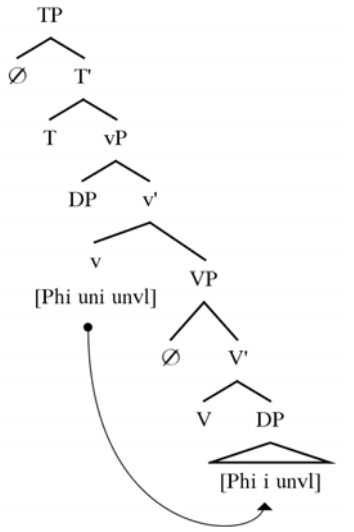
Agree chain for Tense:



Agree for φ-features:

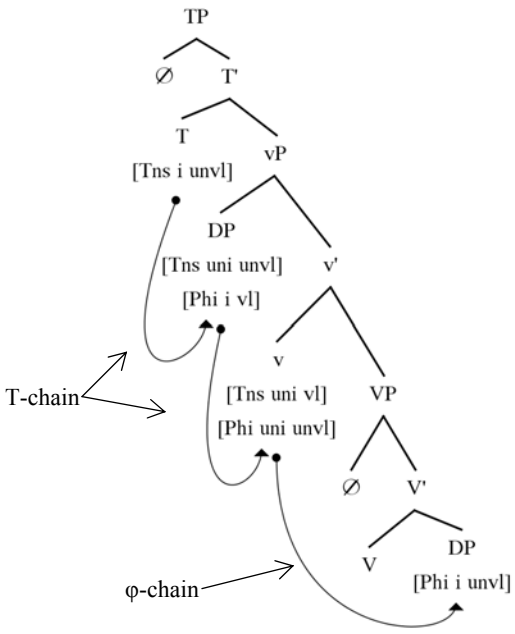


A reflexive like Norwegian *seg* enters the derivation with unvalued φ-features:



An Agree relation is nevertheless formed. Interpretable, but unvalued φ-features are at the phase edge v^0 with another *instance* in the object DP. The phase edge v^0 is accessible for further operations.

v^0 enters an Agree chain for Tense, as seen above. According to Reuland, the φ-feature chain can 'piggy-back' on the Tense-chain, since v^0 is a part of both chains. Since the subject DP carries valued φ-features, it agrees with the φ-features in v^0 and values the chain → binding of the object DP.



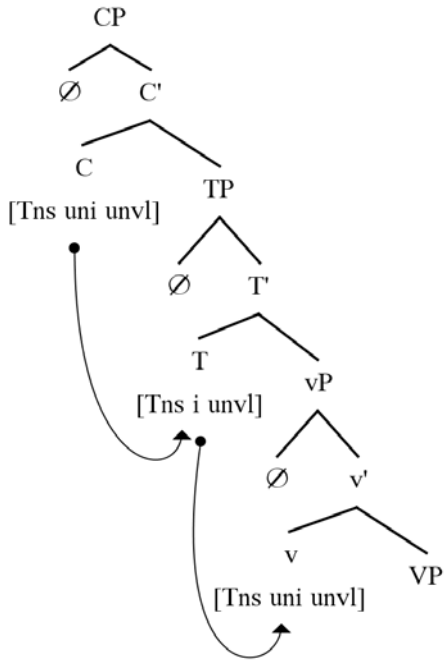
7. The syntax of sequence of tense (Enç 1987, Khomitsevich 2007)

Underlying assumption (Enç 1987, Pesetsky/Torrego 2001, 2004, 2007, Landau 2004, Khomitsevich 2007): C^0 carries an uninterpretable Tense feature.

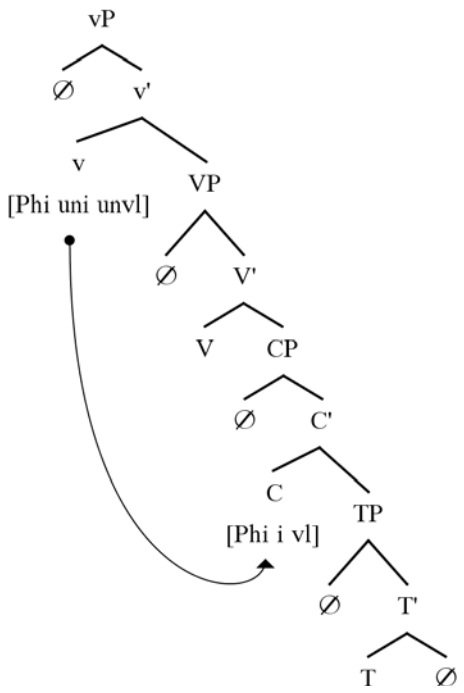
Starting with Enç 1987, a standard assumption has been that a complement tense that exhibits a simultaneous reading with the matrix tense is *syntactically bound* by the matrix tense.

Khomitsevich 2007 adopts Reuland's binding model to explain Enç's *tense binding*. Analogous with reflexive pronouns entering the derivation with unvalued φ-features, anaphoric tense enters the derivation with unvalued Tense features on v^0:

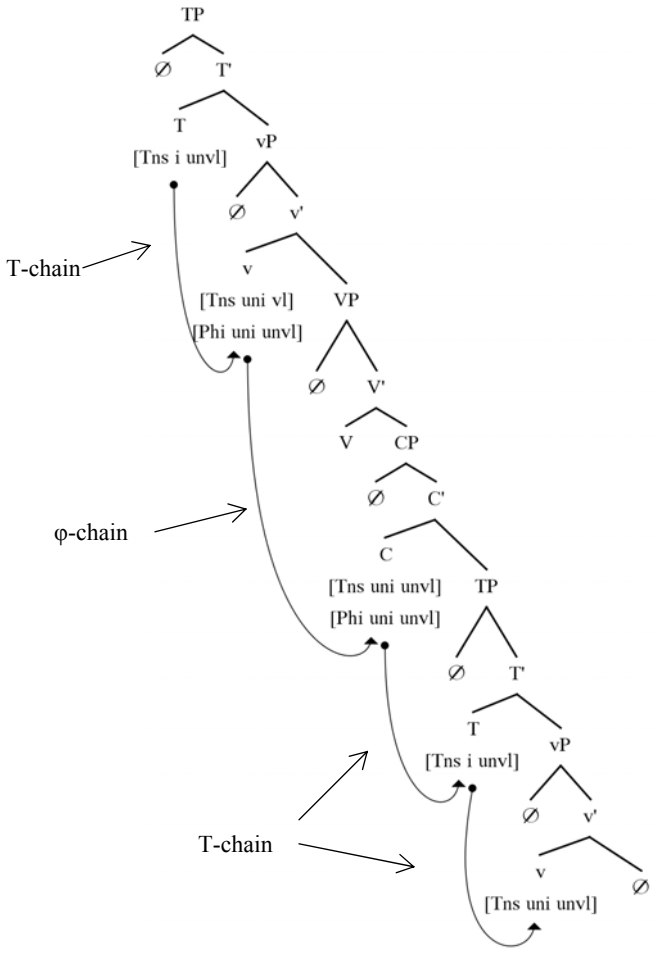
Agree chain for Tense:



This Agree chain has an interpretable, but unvalued feature in the phase edge C^0. When merged with the higher clause, the unvalued φ-features of the v^0 probe and enter an Agree relation with the φ-features in C^0:



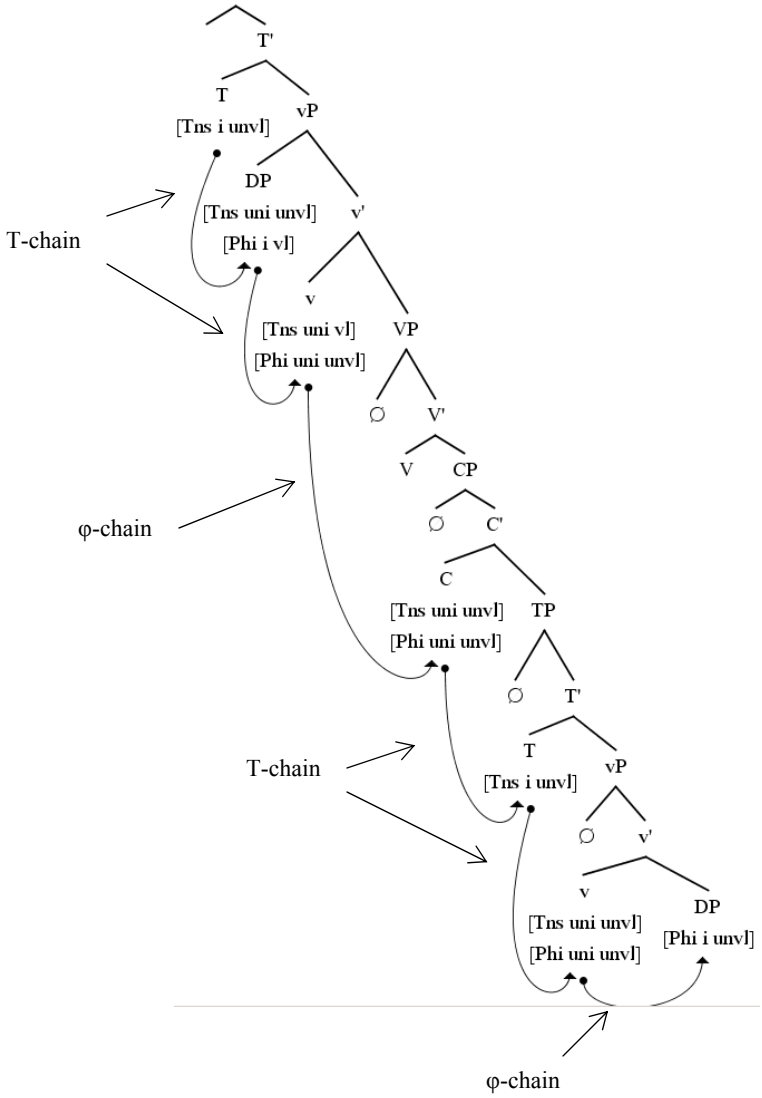
There are two Agree chains for C^0: one for Tense with the lower clause and one for φ-features with the higher clause
There are two Agree chains for v^0: one for φ-features in the lower clause and one for Tense in the higher clause
The unvalued Agree chain for Tense in C^0 can now piggy-back on the φ-feature chain between C^0 and v^0. Since v^0 forms a Tense chain in its own clause, the unvalued Tense chain in C^0 will be valued by the Tense chain in the higher clause → the tense in the higher clause binds the tense in the lower clause:



8. Binding + sequence of tense = long-distance binding

Reuland's model of binding involves the local φ-chain piggy-backing on the local Tense-chain. As seen above, if the local Tense-chain is unvalued, it will itself piggy-back to the higher clause, where it is valued, and 'bound', by the higher Tense chain.

It is therefore expected that a *seg*-reflexive with unvalued φ-features has the option of piggy-backing all the way to the higher clause, where the same process reiterates itself.



Binding by the local subject:

Why doesn't the local subject value and bind *seg* – preventing *seg* from piggy-backing to the higher clause?

In almost all cases discussed in this paper, *seg* cannot be bound locally – this is the domain of the complex reflexive *seg sjøl*. If *seg* is selected from the numeration, it needs to be valued outside of its local domain. The interclausal Tense-chain allows it to be.

In the rare cases where *seg* could be bound in the local clause (as in (10)), local binding is ruled out for semantic reasons – it gives an infelicitous reading.

9. Further issues

9.1 Italian

A very similar case to the Norwegian pattern seems to obtain in Italian. As is well known, the Italian possessive reflexive *proprio* can be bound long-distance out of a complement clause if the clause is in the subjunctive, but not if it is in the indicative (cf. Giorgi 2006).

At the same time, Italian exhibits the SOT effect only if the complement clause is in the subjunctive (cf. Giorgi/Pianesi 2000). Since the long-distance binding of *proprio* cannot be strictly correlated with the presence of the subjunctive (adjuncts can be in the subjunctive, but they don't allow long-distance binding), it seems rather that the long-distance binding in Italian is correlated with the availability of SOT.

9.2 *seg* as the argument of the verb

All the examples in this paper of long-distance binding of *seg* have it as the argument of a preposition. If *seg* is the argument of a verb, long-distance binding is ruled out:

(35) *Reven$_i$ så at ingen kunne finne seg$_i$
The-fox saw that no one could find self
'The fox saw that no one could find him'

The reason for this is yet unclear.

9.3 SOT and binding in non-perception verbs

In Norwegian, SOT is the preferred reading in all clausal complements. So why can't *seg* be used to disambiguate between a simultaneous and a past-shifted reading in complements of non-perception verbs?

The Tense features come unvalued only on truly anaphoric verb forms (cf. Landau 2004, where only infinitival complements are considered to have unvalued T features), which in Norwegian would only apply to non-finite verb forms and complements of perception verbs.

SOT in other complements ('English style SOT') would then need to be explained differently – for which there is no lack of theories (cf. i.a. Abusch 1997, Kratzer 1998, Kusumoto 1999, Stowell 2007).

I'm indebted to Andrew Nevins for having pointed me to references showing that perception verbs are special in Russian (section 4.2), which ultimately proved crucial in establishing the link between tense dependency and pronominal dependency.

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