The Discourse Semantics of Long-Distance Reflexives

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Glossing conventions and text editions

The wording of the Latin examples in this dissertation follows the editions in the digital Loeb Classical Library.[1] Abbreviations of authors and texts follow the conventions of the *Oxford Latin Dictionary* (Glare, 2012).

The interlinear glossing of Latin examples follows the Leipzig glossing rules (Bickel et al., 2015). Glosses used in Latin examples which are not found in the list in Bickel et al. (2015, p. 8-10) are:

CPV = comparative

GER = gerund/gerundive

SU = supine

[1] `http://www.loebclassics.com/`

Contents

Chapter 1

General introduction

1.1 Introducing the topic

This dissertation will argue for a discourse-semantic analysis of long-distance reflexives, based on Latin data. One of the virtues of the formal linguistic research conducted at the end of the last century was the precise characterization of the behavior of different pronominal elements. In particular, it was found that the difference in distribution between reflexive pronouns and other pronominals, exemplified in (1), to a large extent could be explained in terms of locality and structural relations:[2]

(1)

a. John$_i$ kicked himself$_i$.

b. *John$_i$'s egoism killed himself$_i$.

c. *John$_i$ thinks that I kicked himself$_i$.

d. *John$_i$ kicked him$_i$.

e. John$_i$'s egoism killed him$_i$.

f. John$_i$ thinks that I kicked him$_i$.

These contrasts are famously captured in the conditions of Chomsky's Binding Theory (Chomsky, 1981, p. 188): A reflexive pronoun, e.g. *himself*, must be *bound* in its *governing category* (Condition A). This condition depends on the two notions of *binding* and *governing category*. The binding requirement means that there is a particular structural relationship between the antecedent and the pronoun. In Chomsky's framework, a bound pronoun is a pronoun *c-commanded* by its antecedent, i.e., the pronoun must be a sister of the antecedent in the phrase-structure tree, or embedded within the sister of the antecedent.[3] There is a structural relationship of this kind between the subject and the object of a verb, and (1a) is therefore grammatical. In (1b), on the other hand, the antecedent is in a non-c-commanding position, and *himself* is therefore unbound, which

[2]Coreference between pronouns and antecedents is marked with subscript indices here and in the rest of the dissertation.

[3]This definition of c-command is based on Adger, 2003, p. 117.

makes the sentence ungrammatical. The *governing category* is the local domain in which the reflexive must find its antecedent, and corresponds roughly to the finite clause. The antecedent in (1c) binds the reflexive. However, there is an intervening clause boundary, and the sentence is therefore ungrammatical. Personal pronouns such as *him*, on the other hand, must not be bound in their governing category (Condition B). Since the pronoun is bound by the local subject in (1d), the sentence is ungrammatical. (1e) is grammatical, however, since the pronoun is not bound by the antecedent. (1e) is also grammatical, although the pronoun is bound, since there is an intervening finite clause boundary.

It is a well-known fact that not all reflexive pronouns obey the locality requirement of Condition A. A number of languages have *long-distance reflexives* (LDRs), reflexive pronouns whose antecedents are found in a superordinate clause or even in a previous sentence. While there is quite a bit of cross-linguistic variation when it comes to the distribution and referential properties of LDRs (see e.g. Koster and Reuland, 1991; Cole et al., 2001), one pattern is recurring: LDRs are used in indirect discourse to refer back to the individual whose words or thoughts are reported. This use is attested in languages as different as Icelandic (Maling, 1984; Sigurðsson, 1990), Mandarin (Huang and Tang, 1991; Huang and Liu, 2001), Japanese (Sells, 1987), Tamil (Sundaresan, 2012), and Latin (Fruyt, 1987; Solberg, 2011; Jøhndal, 2012, chap. 4). (2) is a representative Latin example:

(2) *A* *Caesare*$_i$ *valde* *liberaliter* *invitor* ... *[sibi*$_i$ *ut*
by Caesar very graciously invite.PASS.PRS.IND.1SG REFL.DAT that
sim *legatus]* ...
be.PRS.SBJV.1SG staff.officer.NOM

'I have very graciously been invited by Caesar$_i$ to be his$_i$ staff officer.' (Cic. Att. 2.18.3; Benedicto (1991, ex. (25)))

In (2), a reflexive, *sibi*, occurs in a subjunctive-marked clause that is the complement of a passivized utterance predicate.[4] The antecedent is the utterance agent, which in this case is expressed in an agentive PP.

While attempts have been made to analyze LDRs of this kind in purely syntactic terms (e.g., Benedicto, 1991 and Huang and Tang, 1991), most contemporary treatments draw, at least to some extent, on semantics (Sells, 1987; Huang and Liu, 2001; Sundaresan, 2012, a.o.). In particular, it appears to be difficult to capture the antecedence conditions of LDRs in purely syntactic terms: While LDRs in indirect discourse tend to be subject-oriented, there is no subjecthood requirement, and an LDR does not even need to be bound in the sense of Binding Theory, explained above. In (2), the antecedent is neither a subject nor does it c-command the reflexive, as the antecedent is embedded within a PP. LDRs can even take extra-sentential antecedents, as we will see ample evidence of below.

Given that LDRs in indirect discourse refer to the individual whose words or thoughts are reported, it is tempting to base an account on semantic properties specific to indirect discourse. The distribution is, however, slightly more complex: There are also attested

[4]Here, the complement clause is marked with brackets. I will mark relevant subordinate clauses in this way when useful.

cases outside of indirect discourse in Japanese (Kuno and Kaburaki, 1977), Tamil (Sundaresan, 2012) and Latin (Solberg, 2011), and a comprehensive theory of LDRs must be able to account for that possibility too. One environment where LDRs are found in Latin is in complements to verbs meaning 'deserve', as in (3):

(3) *unum* *hoc* *scio,* *[hanc$_i$* *meritam* *esse*
only.ACC this.ACC know.PRS.IND.1SG she.ACC deserve.PTCP.PRF.ACC.F be.INF
[ut *memor* *esses* *sui$_i$]]*
that mindful.NOM be.SBJV.2SG REFL.GEN

'I know only this, that she$_i$ has deserved that you remember her$_i$.' (Ter. Andr. 281; Kühner and Stegman, 1976/1997a, p. 613)

In (3), the reflexive *sui* occurs in a subjunctive complement clause and refers back to the subject of the complement-taking predicate of that subjunctive clause, *mereor*, 'deserve'. Complements to predicates of deserving do not report on the antecedent's speech or thought.[5] It is a challenge to formulate a semantic account which explains the behavior of LDRs in indirect discourse, as in (2), but which also allows for cases like (3), where the LDR is not in indirect discourse. It has been shown for Japanese and Tamil that LDRs outside of indirect discourse are sensitive to perspective shift (Kuno and Kaburaki, 1977; Sells, 1987; Sundaresan, 2012), and perspective-based accounts have also been suggested for the attested Latin examples (Bertocchi, 1989, 1994; Solberg, 2011; Jøhndal, 2012, sect. 4.5).

While it is well-known that Latin allows for reflexives with long-distance antecedents, Latin data has not played an important part in the theoretical discussion of the phenomenon. Latin bears witness to phenomena which are of great relevance to the semantics of long-distance reflexivity, however. One such phenomenon is LDRs with discourse antecedents: In Latin, indirect discourse can be extended over multiple sentences. In such long passages of indirect discourse, LDRs can pick up an antecedent several sentences away. (4) is an example:

(4) *Ariovistus$_i$* *ad* *postulata* *Caesaris* *pauca* *respondit,* *de*
Ariovistus.NOM to demands Caesar.GEN few.ACC responded.IND about
suis *virtutibus* *multa* *praedicavit:* *...* [16 sentences] *...* *quid*
POSS.REFL virtue many.ACC proclaimed.IND what.ACC
sibi$_i$ *vellet* *...?*
REFL.DAT want.SBJV

'Ariovistus$_i$ responded to Caesar's demands in few words, and proclaimed his own virtue in many: ... What did he [Caesar] want from him$_i$?'. (Caes. Gal. 1.44.1;8)

The first sentence in (4) introduces a speech given by Ariovistus to Caesar, and the subsequent sentences render Ariovistus' speech in indirect discourse. The second sentence

[5]The complement-taking predicate is itself embedded within the complement of a first-person knowledge verb, which is immaterial to the issue under investigation.

of the example, as it is given here, contains an LDR referring to Ariovistus, mentioned 17 sentences earlier. Multi-sentence indirect discourse of this kind is widely attested in Latin. While comparable cases of long-distance reflexivity have been reported for other languages (see Sundaresan, 2012, sect. 3.1.2 for Tamil; Sells, 1987, p. 455 for Japanese and Sigurðsson, 1990, sect. 3.3 for Icelandic), there have been few attempts at integrating an account of long-distance binding with a semantic analysis of this kind of indirect discourse.

LDRs in Latin also allow for certain antecedents which have not been reported for other languages, to my knowledge. A particularly interesting case is indirect discourse conveyed by a messenger on behalf of a sender, a rather common scenario in Latin narratives. In such cases of indirect discourse, LDRs are often oriented towards the sender of the messengers rather than the messengers themselves:

(5)

a. *Ibi* *ei* *praesto* *fuere* *Atheniensium*$_i$ *legati*$_j$
there him.DAT ready were.IND Athenians.GEN messengers.NOM
orantes *[ut* *se*$_i$ *obsidione* *eximeret].*
pray.PTCP.PRS.NOM.PL that REFL.ACC siege.ABL free.SBJV

'There he met messengers$_j$ from the Athenians$_i$ who begged him to free them$_i$ from the siege.' (Liv. 31.14.3; Riemann 1884, p. 139)

b. *... Philocles*$_i$ *regius praefectus a Chalcide nuntios*$_j$ *mittebat:*
Philocles.NOM royal prefect.NOM from Chalcis messengers.ACC sent.IND
se$_i$ *in tempore adfuturum* *...*
REFL.ACC in time be.present.PTCP.FUT.ACC

'Philocles$_i$, the royal prefect, sent messengers$_j$ from Chalcis: He$_i$ would be there in due time.' (Liv. 32.16.13)

In (5a), an LDR occurs in a complement clause reporting the speech of some *messengers from the Athenians*. The LDR in the reported speech refers to the Athenians, not the messengers who actually convey the message. In (5b), a multi-sentence stretch of indirect discourse follows the mention of Philocles sending messengers. Again, the LDRs in the indirect discourse refer to Philocles, not the messengers. Examples like these, which I refer to as *messenger reports*, have interesting consequences both for the theory of long-distance reflexivity and for the semantics of indirect discourse, because LDRs appear to be oriented towards someone other than the individual whose words the discourse reports.

A major goal of this dissertation is to show how phenomena like these can be accounted for in a semantic theory of long-distance reflexivity and indirect discourse. I will argue that LDRs are anaphors with presuppositional restrictions to shifted perspective holders. Perspective shift itself will be analyzed in terms of event semantics and thematic roles. By modeling perspective shift, and consequently LDR antecedence, in the event semantics instead of in the modal semantics of indirect discourse, it is possible to account for LDRs in indirect discourse, without excluding the possibility of LDRs in other environments. In part because of the relevance of multi-sentence indirect discourse, I will argue

that long-distance binding should be framed within a dynamic semantic framework, and I will propose an analysis within Partial Compositional Discourse Representation Theory (Haug, 2013) augmented with a modal semantics and a Neo-Davidsonian event semantics. The empirical focus of this dissertation is on Latin, but I will also discuss how LDRs in other languages can be accounted for along similar lines. A number of linguistic issues are addressed in this dissertation which go beyond questions of pronominal reference, in particular the event semantics of propositional attitude reports, the division of labor between syntax and semantics and the formal treatment of multi-sentence indirect discourse.

1.2 The data collection

This is not the first time I have approached the subject of LDRs in Latin. My master's thesis (Solberg, 2011) presented a corpus investigation of the phenomenon from an early version of the Caesar subcorpus of the PROIEL corpus, consisting of approximately 14 000 words. The PROIEL corpus is a treebank with morphological and dependency grammar annotation. All the annotation is done manually (Haug et al., 2009). In addition to my own corpus collection, I considered data from the grammatical literature on Latin (Solberg, 2011, p. 7).

The theoretical argumentation of this dissertation is to some extent based on my earlier findings, but I have also checked and refined those findings in larger corpora, and I have included more data from the grammatical and linguistic literature. The corpus collection of the current project was conducted in two phases.

First, I checked every instance of the reflexive pronoun *se* in the current version of the Cicero and Caesar subcorpora of PROIEL, which consists of around 84 000 tokens. For each of the 604 instances of *se* in these corpora, I determined whether the reflexive is locally bound or is an LDR. For the LDRs, I checked the syntactic function of the reflexive, the type of clause containing the reflexive, the syntactic function of the antecedent, the depth of embedding of the clause containing the reflexive and the lemma of the clause-embedding predicates occurring between the reflexive and the antecedent.

Second, I queried for specific constructions in a sentence-segmented version of the Latin corpus of the Packhard Humanities Institute (the PHI corpus).[6] This corpus consists of all known Latin texts written before 200 AD, as well as some selected works from late antiquity, amounting to around 9 million words in total. With one exception, example (232a), I have exclusively considered examples written before 200 AD in this dissertation. The most ancient quoted author is Plautus, born around 254 BC. I have simply assumed that the phenomena under investigation have not changed substantially during the classical period.

The lack of negative data is of course a problem when investigating grammatical phenomena in corpora. It is not possible to conclude that a construction is ungrammatical from the lack of attested examples, and this is even more true for Latin, where the corpora are small. Despite this, I have occasionally chosen to make assumptions based on lack

[6] `http://latin.packhum.org`. Thanks to Marius Jøhndal for making the sentence-segmented version of the corpus.

of attested examples, particularly when I discuss messenger reports in chapter 7. When I do this, I try to be explicit about what kind of data we would need to falsify my generalizations.

1.3 Terminological clarifications

It is necessary to clarify some terminological choices before continuing. Pronouns such as *se* in Latin and *herself* in English are called *reflexive pronouns* by some, *anaphors* by others. In this dissertation, I will refer to such pronouns as *reflexive pronouns* and *reflexives*. The term *anaphor* is used in the discourse semantic sense of the word: It refers to pronouns (or other linguistic entities) which need to be resolved to an antecedent in the textual discourse (see, e.g., chapter 4). The phenomenon of reflexives with long-distance antecedents will be referred to as *long-distance reflexivity*. I will also occasionally talk about *long-distance binding* of reflexives. This is not to be understood as binding in the technical sense of Binding Theory or any other framework, but should be taken as a synonym for *long-distance reflexivity*.

Other terminological clarifications will be made at appropriate places in the text.

1.4 Organization of the dissertation

In Chapter 2, I present an overview of long-distance binding in Latin, based mostly on Solberg (2011). We see that LDRs are common in indirect discourse in Latin, and that they refer to an individual whose speech or mind the indirect discourse expresses. In Latin, indirect discourse can be extended over multiple sentences, a phenomenon sometimes called *unembedded indirect discourse* (Bary and Maier, 2014), and such multi-sentence cases of indirect discourse can contain LDRs. In addition, there are attested examples outside of indirect discourse, a fact which will be crucial for the choice of analysis. Furthermore, it is shown in this chapter that LDRs in Latin have commonalities with long-distance reflexive binding in a number of other languages, and that appeals to the notion of perspective shift are frequently made to explain the referential behavior of LDRs. We also look briefly at a couple of other pronouns with behavior comparable to LDRs: logophors and shifted first-person pronouns.

Chapter 3 presents four desiderata for a semantic theory of LDRs. Previous semantic research on the phenomenon is discussed from the point of view of these desiderata. I argue that no single previous treatment provides a satisfactory answer to all of the desiderata. Accordingly, I outline a new analysis. In the chapters that follow, I will progressively build up this account.

The semantic framework I will use, Partial Compositional Discourse Representation Theory (Haug, 2013), is presented in Chapter 4. Modality and a Neo-Davidsonian event semantics are added to the framework.

The core part of the analysis is found in Chapter 5: Here, I argue for an event semantics of clausal complements to speech/thought verbs, based on Hacquard (2006, 2010) and Anand and Hacquard (2008). I add an event-semantic approach to perspective shift, in

part based on Deal (2014), and an anaphoric semantics for LDRs. Equipped with this, I develop an analysis of LDRs in indirect discourse complements. I also show how the treatment of perspective shift can be extended to non-attitudinal environments where LDRs occur.

The account of LDRs in complement clauses developed in the previous chapter will be extended to unembedded indirect discourse in Chapter 6. I will argue that this phenomenon involves anaphoric utterance events. When perspective shift is added to this account, it is possible to make sense of LDRs in that environment.

Chapter 7 first discusses messenger reports containing LDRs in Latin, which have been considered problematic in previous treatments. It is argued on the basis of a corpus study that the messenger reports can be divided into three separate phenomena, each of which can be accounted for with minimal modifications to the semantic theory. Second, the chapter looks at some residual issues in light of the previous chapters.

Finally, Chapter 8 concludes this dissertation by evaluating the analysis with respect to the desiderata from Chapter 3. The conclusion also suggests some avenues for future research.

Chapter 2

An overview of long-distance reflexivity

2.1 Introduction

The main purpose of this chapter is to introduce the empirical phenomena which will be discussed in this dissertation. Section 2.2 looks at the morphology of Latin reflexives. Indirect discourse is by far the most common environment for LDRs in Latin. In Section 2.3 I therefore look at the definition of indirect discourse and the grammatical properties of indirect discourse in Latin. Section 2.4 presents the use of LDRs in Latin indirect discourse. As we have seen, there are also examples of LDRs outside of indirect discourse in Latin, which will be the topic of Section 2.5. Section 2.6 presents my reasons for treating LDRs as a distinct phenomenon from locally bound reflexives in Latin. It turns out that a number of languages have LDRs with comparable behavior to those of Latin, and I will look at some representative cross-linguistic examples in Section 2.7. There, I will also show that there is a connection between LDRs and perspective shift, a fact which has informed much of the theoretical discussion. In Section 2.8 I briefly look at two other lexical items with behavior similar to LDRs, logophors and shifted first-person pronouns. Finally, Section 2.9 summarizes the phenomena presented in this chapter.

The presentation of LDRs in Latin is mainly based on my master's thesis (Solberg, 2011). New findings from the present project will be presented in the analyses in chapters to come.

2.2 Latin reflexives

In this chapter and in the rest of this dissertation, I will focus on the personal reflexive *se*, and for the most part disregard the possessive reflexive *suus*. *Suus* has an emphatic use which *se* lacks. In this emphatic use, *suus* is not subject to the same antecedent constraints as local or long-distance *se* (cf. Menge 2000, § 84; Jøhndal 2012, p. 106-107). Because of this freer distribution, it is difficult to make conclusive arguments based on *suus*. Solberg (2011) was also predominantly concerned with *se*.

The personal reflexive in Latin has the morphological paradigm in Table 2.1. As can be seen from this table, the reflexive does not have a nominative form. This is not because there is no place where a nominative reflexive would be licit: Since *se* can

take long-distance antecedents in finite clauses, a nominative personal reflexive would not have been unexpected, e.g., as the subject of a subjunctive clause in indirect discourse, and possessive reflexives do indeed occur in this environment. In such positions, other pronouns are used instead of LDRs. This lack of a nominative reflexive is not in any way special to Latin: Nominative reflexives are uncommon cross-linguistically (see e.g. Rizzi, 1990; Woolford, 1999).[7]

Case	**Form**
Accusative	se/sese
Genitive	sui
Dative	sibi
Ablative	se/sese

Table 2.1: Morphological paradigm for *se*

It is also evident from the table that the reflexive is only inflected for case, not for person, gender or number, unlike English reflexives. *Se* is only used in the third person; in the first and second person, there is no morphological distinction between reflexive pronouns and regular personal pronouns. *Se* can be used with singular and plural antecedents alike. While the reflexive itself does not have overt number or gender agreement, adjectives with which it agrees are inflected for gender and number.

In the accusative and the ablative, there is a simplex form *se* and a complex form *sese*. The simplex form is by far the most common: A query of the PHI corpus (cf. Section 1.2) gives 20 500 results for *se* and 1 600 for *sese*. There does not seem to be any obvious syntactic or semantic difference between the two forms, at least none which is relevant for this study.[8] Both forms are used with both local and long-distance antecedents, and I haven't observed a difference in use between the simplex and the complex of the kind found in, e.g., Germanic languages (Hellan, 1991; Reinhart and Reuland, 1993). I will therefore consider these two forms variants of the same grammatical object.

2.3 Indirect discourse in Latin

Before turning to LDRs in indirect discourse, it is necessary to make precise what I mean by indirect discourse and say a few words about the grammatical properties associated with indirect discourse in Latin.

2.3.1 Definition of indirect discourse

Indirect discourse consists of clauses which reproduce utterances, thoughts or emotions of a discourse-internal agent of utterance or experiencer of a mental state. In prototypical cases, indirect discourse is represented as complement clauses to predicates which indicate

[7]But nominative reflexives are attested, e.g., in Tamil (cf. Sundaresan, 2012, sect. 11.1.5 and Sundaresan, 2016).

[8]According to Glare (2012, entry on *se*), the complex form was originally used for emphasis, but there is no obvious distinction in use between the two forms in Classical Latin.

a specific type of utterance, such as *say* or *ask*, or a propositional or emotional attitude, such as *believe*, *doubt* or *regret*. Perception predicates such as *hear* and *see* can also introduce indirect discourse when they are used as acquisition-of-knowledge predicates (Whitt, 2009, 2011). Clauses of indirect discourse are not always syntactically embedded, however. A passage of indirect discourse can also span multiple sentences. I will return to this in Subsection 2.3.3.

Indirect discourse is distinguished from quotation in that quotation reproduces the original utterance word by word, while clauses of indirect discourse reproduce the content of what has been said or thought, without necessarily reproducing the exact words. This can be seen in the use of indexicals in particular: In quotations, all indexicals are directed towards the person whose words are quoted; in indirect discourse, indexicals are seen from the perspective of the external speaker:

(6) a. Quotation: Peter said: "I am hungry."

b. Indirect discourse: Peter said that he was hungry.

In the quotation in (6a), the personal pronoun is first-person and the tense is present, as they were in the original utterance. In the indirect discourse in (6b), however, the personal pronoun is third-person and the tense is past, as seen from the external speaker's point of view (Maier, 2012, p. 118-119).[9]

Indirect discourse is associated with a particular kind of semantics. The interpretation of a complement of a speech/thought predicate is relativized to the utterance agent or the holder of the mental state. The sentence in (7) is true whether or not Peter is ill, as long as it is consistent with John's belief that he is.

(7) John believes that Peter is ill.

Predicates like *believe* are said to ascribe a *propositional attitude* of the subject towards the complement proposition.

One of the consequences of the attitudinal semantics is that replacing coreferring terms in the indirect discourse can affect the truth value of the sentence. The two sentences in (8) can be true simultaneously, even though Clark Kent and Superman are one and the same individual, as long as Lois is unaware of this coreference (Frege, 1948; Hintikka, 1969. See McKay and Nelson, 2014 for a good overview):

(8) a. Lois believes that Superman is strong.

b. Lois believes that Clark Kent is not strong. (examples from McKay and Nelson, 2014, ex. (1) and (2))

In this dissertation, I will refer to the predicates involved in indirect discourse as *attitude predicates*, and the individual to which the interpretation is relativized will be called the *attitude holder* (AH). Complements to attitude predicates will be called *attitudinal complements* or *speech/thought complements*. Note that the term *propositional attitude*

[9]The term *direct discourse* is often used instead of *quotation*, e.g. in Maier (2012).

predicates is sometimes reserved for mental state verbs. In this dissertation, the term is used for both communication and thought verbs, as both share this relativizing semantics (cf. Pearson, 2015c).

2.3.2 Mood and finiteness in Latin indirect discourse

In Latin, attitudinal complements can be realized as subjunctive clauses with different complementizers: *Ut* (and its negative counterpart *ne*) is common, as in (9a), but other complementizers are also found, such as *quin* in (9b). Furthermore, attitudinal complements can be subjunctive *wh*-clauses, as in (9c), or *accusativus-cum-infinitivo*-clauses (AcIs) with an accusative subject and an infinitive verb, as in (9d) and (9e).

(9) a. *... peto* *quaeso=que* *[ut* *tuos* *me=cum*
ask.IND.1SG beg.IND.1SG=and that POSS.ACC.2PL me.ABL=with
serves] *...*
preserve.SBJV.2SG

'I ask and beg you to preserve your friends as well as me.' (Cic. Fam. 5.4.2; Menge 2000, p. 766)

b. *at* *nemo* *dubitat* *[quin* *subsidio* *venturus*
but no.one.NOM doubts.IND COMP support.DAT come.PTCP.FUT.NOM
sit].
be.SBJV

'But no one doubts that he will come to help.' (Cic. Att. 8.7.1; Jøhndal 2012, p. 84)

c. *Rogant* *me* *serui* *[quo* *eam].*
ask.IND me.ACC servants.NOM where go.SBJV.1SG

'The servants ask me where I am going.' (Pl. Cur. 362; Jøhndal 2012, p. 88)

d. *ego* *[me* *amare* *hanc]* *fateor.*
I.NOM me.ACC love.INF her.ACC confess.PRS.IND.1SG

'I confess that I love her.' (Ter. An. 898)

e. *sanum* *te* *credis* *esse?*
healthy.ACC you.ACC believe.PRS.IND.2SG be.INF

'Do you think you are sensible?' (Ter. Ad. 747)

Figuring out the precise conditions for when one or the other form is used is far from a trivial matter. I will return briefly to the distribution of the different complement types in Subsection 5.4.1. For now, suffice it to say that the distinction between AcIs and subjunctive complements seems lexical rather than semantically motivated.

Note that these clause types are not only used for indirect discourse. Subjunctive complements with *ut* also occur with some non-attitudinal modal predicates (e.g., *mereor*,

'deserve'), cf. (3), as well as with certain subjectless one-place predicates, exemplified in (10a) (Jøhndal 2012, p. 85; Menge 2000, p. 783-787). Subjunctive *ut*-clauses can also be adverbial clauses, either expressing a purpose or an effect; see (10b) (see, e.g., Menge, 2000, p. 807-811). AcIs also have various other uses as well, e.g., as clausal subjects to various one-place predicates, as in (10c) (Menge 2000, p. 674-676).

(10)

a. *... accidit [ut esset luna plena] ...*
happened.IND that be.SBJV moon.NOM full.NOM

'It happened that the moon was full' (Caes. Gal. 4.29.1; example and translation from Jøhndal, 2012, ex. (84), p. 85)

b. *... [ut spatium intercedere posset, dum milites ...*
that interval.ACC intervene.INF can.SBJV while soldiers.NOM
convenirent], legatis respondit ...
meet.SBJV messengers.DAT answered.IND

'In order that there was time for the soldiers to assemble, he answered the messengers that ...' (Caes. Gal. 1.1.7; Menge, 2000, p. 807)

c. *... tempus est ... [hinc abire me] ...*
time.NOM is.IND from.here depart.INF me.ACC

'It is time that I leave.' (Cic. Tusc. 1.99; Menge, 2000, p. 675)

Despite subjunctive clauses having nominative subjects and finite verb forms and AcIs having accusative subjects and non-finite verb forms, they have important properties in common. Both clause types can mark anteriority, simultaneity and posteriority relative to time of the speech/thought predicate. For AcIs, this is accomplished using the perfect, present and future infinitive, respectively, as exemplified in (11). This contrasts with infinitives in control constructions, where future infinitives are unattested and perfect infinitives are very rare (cf. Jøhndal 2012, p. 52-53). Subjunctive clauses in indirect discourse respect a sequence of tense: The tense morpheme of the subjunctive clause agrees with that of the speech/thought predicate and does not situate the complement clause independently with respect to utterance time. Relative anteriority with respect to the speech/thought predicate is expressed by perfect forms: present perfect if the speech/thought predicate has present tense; pluperfect if it has a past tense. Relative simultaneity is expressed by a present or an imperfect subjunctive, while a periphrastic future subjunctive is used for posteriority, cf. (12a) and (12b) (Menge, 2000, §461 and §479) :[10]

[10]Evidently, not all attitude predicates will be compatible with the full range of relative tenses. A relative past in the complement clause will not be compatible with manipulative predicates such as *order*, for example.

(11) *puto* *[me* *recte* *facere/* *fecisse/* *facturum*
believe.PRS.IND.1SG me.ACC correctly do.PRS.INF do.PRF.INF do.PTCP.FUT.ACC
esse].
be.PRS.INF

'I think that I act/acted/will act correctly.' (Sjöstrand 1960, p. 299; constructed example)

(12) a. *scio* *[quid* *faciat/* *fecerit/*
know.PRS.IND.1SG what.ACC do.PRS.SBJV.3SG do.PRF.SBJV.3SG
facturus *sit].*
do.PTCP.FUT.NOM be.PRS.SBJV.3SG

'I know what he does/did/will do.'

b. *sciebam* *[quid* *faceret/* *fecisset/*
know.PST.IND.1SG what.ACC do.PST.SBJV.3SG do.PST.PRF.SBJV.3SG
facturus *esset].*
do.PTCP.FUT.NOM be.PST.SBJV.3SG

'I knew what he did/had done/would do.' (Sjöstrand 1960, p. 285-286; constructed examples)

A second similarity between the two clause types is the possibility of LDRs, which will be investigated in detail in this dissertation.

Clauses which would be in the indicative if they occurred outside of indirect discourse will often be in the subjunctive when occurring within the scope of a speech/thought predicate, as in (13a) and (13b). Indicative clauses also occur, but there is normally a meaning difference. A subjunctive clause is interpreted within the scope of the speech/thought predicate; it is, in other words, interpreted as being part of what is reported. An indicative clause, on the other hand, is interpreted outside of the predicate's scope, as a comment from the external speaker. This is exemplified in (13c) (Menge 2000, p. 658-659; Ernout and Thomas 1953, p. 424-426):

(13) a. *Huic* *imperat,* *[[quas* *possit],* *adeat* *civitates]* *...*
him.DAT orders.IND which.ACC can.SBJV visit.SBJV states.ACC

'He orders him to visit all the states he can.' (Caes. Gal. 4.21.8)

b. *...* *Prodicus* *Cius* *...* *[ea* *[quae* *prodessent* *hominum*
Prodicus.NOM Cius.NOM those.ACC which.NOM benefit.SBJV men.GEN
vitae] *deorum* *in* *numero* *habita* *esse]* *dixit* *...*
life.DAT gods.GEN in number have.PTCP.PRF.ACC be.INF said.IND

'Prodicus Cius said that those things which were beneficial to the life of men should be considered gods.' (Cic. N.D. 1.118)

c. … *nuntiatum* *est* *ei* *[Ariovistum* … *ad*
announce.PTCP.PRF.NOM was.IND him.DAT Ariovistus.ACC to
occupandum *Vesontionem,* *[quod* *est* *oppidum* *maximum*
occupy.GER.ACC Vesontio.ACC which.NOM is.IND town.ACC biggest.ACC
Sequanorum], *contendere]* …
Sequani.GEN strive.for.INF

'It was announced to him that Ariovistus attempted at occupying Vesontio, which is the largest town of the Sequani.' (Caes. Gal. 1.38.1; Ernout and Thomas 1953, p. 426)

An analogous indicative/subjunctive contrast is found in adjunct clauses outside of indirect discourse: An adjunct clause which normally would be in the indicative will be in the subjunctive if it expresses the opinion of the subject of the superordinate clause or some other discourse-internal individual or group, rather than the opinion of the external speaker. This is exemplified in (14): The subjunctive in the causal clause indicates that it expresses the opinion of those who expelled Aristides.

(14) *Aristides* … *nonne* *ob* *eam* *causam* *expulsus*
Aristides.NOM Q on.account.of that.ACC cause.ACC expel.PTCP.PRF.NOM
est *patria,* *[quod* *praeter* *modum* *iustus* *esset?]*
was.IND native.land.ABL because beyond measure just.NOM was.SBJV

'Wasn't Aristides expelled from his country because he was [considered to be] too just?' (Cic. Tusc. 5.105; Ernout and Thomas 1953, p. 348)

The use of the subjunctive in such adjunct clauses outside of indirect discourse is sometimes called the *oblique subjunctive* in grammars, a term which I will adopt (Sjöstrand 1960, p. 266-268; Menge 2000, p. 627-628).

As we have seen, the main contrast in speech/thought complements in Latin is between AcIs and subjunctive clauses. But there is some disagreement in the literature over whether indicative complements to speech/thought predicates are also attested. A number of emotive predicates, such as *doleo* 'suffer' and *gaudeo* 'be glad', as well as some utterance predicates, such as *gratias ago* 'give thanks' and *reprehendo* 'blame', either take an AcI complement or a clause with the complementizer *quod*. The *quod*-clause can either have an indicative verb, as in (15a), or a subjunctive, as in (15b) (Ernout and Thomas 1953, 297-298; Menge 2000, 793-796).

(15) a. *sane* *gaudeo* *[quod* *te* *interpellavi]* …
truly be.glad.PRS.IND.1SG because you.ACC interrupted.IND.1SG

'I am truly glad I interrupted you.' (Cic. Leg. 3.1; Ernout and Thomas, 1953, p. 298)

b. *multo etiam gravius [quod sit destitus]*
much still heavily.CPV because is.SBJV abandon.PTCP.PRF.NOM
queritur.
complains.IND

'He complains with still more insistence over having been abandoned.' (Caes. Gal. 1.16.6; Solberg, 2011, ex. (2.12c))

In traditional grammars (e.g., Ernout and Thomas 1953 and Menge 2000), such *quod*-clauses are assumed to be complements, and parts of the Latin linguistic literature have also adopted this view (e.g., Benedicto 1991 and Torrego 1986). I also assumed this in my previous work (Solberg, 2011). However, this view has been challenged by Ros (2001, p. 258-259) and Jøhndal (2012, p. 84). *Quod* with an indicative/subjunctive contrast is frequently used in causal adverbial clauses, in which case *quod* means 'because'. It is possible that the *quod*-clauses found in examples such as (15a) and (15b) above are causal adverbial clauses too. I will briefly return to this issue in subsection 7.3.1.

2.3.3 Unembedded indirect discourse

So far we have only looked at indirect discourse to complement clauses. An instance of indirect discourse in Latin can also span over multiple sentences, which often happens when, e.g., an oration is reported. The indirect discourse will often be introduced by a speech predicate, followed by a sequence of sentences containing the content of the speech, but which are not complements to any overt speech predicate. These sentences have mostly the same syntactic properties as the speech/thought complements: They alternate between AcIs and subjunctive clauses, and adjunct clauses to such AcIs/subjunctives are either subjunctive clauses or indicative clauses, depending on whether they are to be interpreted within the scope of the indirect discourse or outside of its scope. (16a) is an example of indirect discourse of this kind, introduced by a speech predicates. It is not uncommon that there is no overt speech predicate introducing the indirect discourse. In such cases, it can usually be inferred from the context that an instance of indirect discourse will follow (see, e.g., Ernout and Thomas, 1953, p. 421-429). This is exemplified in (16b):

(16) a. *Ad quos ... responderunt: Populi Romani imperium*
to which.ACC answered.IND.3PL people.GEN Roman.GEN rule.ACC
Rhenum finire; si se invito Germanos in Galliam
Rhine.ACC limit.INF if REFL.ABL unwilling.ABL Germans.ACC to Gaul.ACC
transire non aequum existimaret, cur sui quicquam
go.over.INF not just.ACC esteemed.SBJV.3SG why REFL.GEN anything.ACC
esse imperi aut potestatis trans Rhenum postularet?
be.INF rule.GEN or power.GEN over Rhine claimed.SBJV.3SG

'[The Germans] answered them: The Rhine marks the boundary of Roman rule; if he did not consider it just for the Germans to cross into Gaul against his will, why did he claim any rule or power across the Rhine?' (Caes. Gal. 4.16.3-4)

b. *... sese omnes flentes Caesari ad pedes*
REFL.ACC all.NOM cry.PTCP.PRS.NOM.PL Caesar.DAT to feet
proiecerunt: Non minus se id contendere et laborare
threw.IND not less REFL.ACC it.ACC strive.INF and work.INF
ne ea quae dixissent, enuntiarentur, quam uti
that.not those.NOM which.ACC said.SBJV reveal.PASS.PST.SBJV than that
ea quae vellent, impetrarent ...
those.ACC which.ACC wanted.SBJV obtained.SBJV

'Crying, they threw themselves at Caesar's feet: They strived and worked no less for securing that those things which they had said, would not be revealed, than for obtaining the things they wanted.' (Caes. Gal. 1.31.2)

Bary and Maier (2014) describe a very similar phenomenon in Greek, which they call *unembedded indirect discourse* (UID), a terminological practice I will follow. Despite the dependent interpretation and the use of non-finite verb forms, Haug et al. (2017) show that there are strong empirical arguments for treating sentences of UID as syntactically unembedded root clauses. I will return to this in section 6.2.

2.4 LDRs in indirect discourse

LDRs in indirect discourse are very frequent in Latin. This presentation of the phenomenon will follow the one from Solberg (2011, Chapter 2) quite closely.

2.4.1 Distribution

LDRs frequently occur in both subjunctive and AcI cases of indirect discourse. They can occupy all syntactic positions suitable for a nominal constituent except the subject position of a subjunctive clause, as there is no nominative personal reflexive in Latin (recall the discussion in section 2.2). An LDR can, and frequently does, occupy the accusative subject position of an AcI, as in (17a). (17b) is an example of a dative LDR in a subjunctive clause with *ut*. In (17c)[11], an LDR occurs as a prepositional complement in an embedded *wh*-clause.

(17) a. *[De numero eorum omnia se$_i$ habere explorata]*
about number their everything.ACC REFL.ACC have.INF explore.PTCP.PRF.ACC
Remi$_i$ dicebant ...
Remi.NOM said.IND

'The Remi$_i$ said that they$_i$ had knowledge of everything concerning their number [the number of members of another tribe].' (Caes. Gal. 2.4.4; Solberg, 2011, ex. (1.9a))

[11] I have rendered the pro-dropped subject of the matrix clause as *pro*. I will follow this practice whenever it is useful throughout this dissertation.

b. *Vbii$_i$ ... magnopere orabant [ut sibi$_i$ auxilium ferret]*
Ubii.NOM greatly entreated.IND that REFL.DAT help.ACC bring.SBJV
...

'The Ubii$_i$ entreated with insistence that he should bring them$_i$ help.' (Caes. Gal. 4.16.5; Solberg, 2011, ex. (1.9b))

c. ... pro$_i$ *ostendit [quae separatim quisque de eo apud*
shows.IND what.ACC separately each.one.NOM about him before
se$_i$ dixerit].
REFL.ACC say.PRF.SBJV

'He$_i$ [i.e. Caesar] shows [Divitiacus] what each one has said about him [i.e. Divitiacus' brother] before him$_i$.' (Caes. Gal. 1.19.4; Solberg, 2011, ex. (2.2))

LDRs also occur in UID, both subjunctive and AcI, as in (18a) (=(4)) and (18b):

(18) a. *Ariovistus$_i$ ad postulata Caesaris pauca respondit, de*
Ariovistus.NOM to demands Caesar.GEN few.ACC responded.IND about
suis virtutibus multa praedicavit: ... [16 sentences] *...*
POSS.REFL virtue many.ACC proclaimed.IND
quid sibi$_i$ vellet ...?
what.ACC REFL.DAT want.SBJV

'Ariovistus$_i$ responded to Caesar's demands in few words, and proclaimed his own virtue in many: ... What did he [Caesar] want from him$_i$?'. (Caes. Gal. 1.44.1;8)

b. pro$_i$ *reddi captivos negavit esse utile; illos*
return.INF prisoners.ACC denied.IND be.INF useful they.ACC
enim adulescentes esse et bonos duces, se$_i$ iam
for young.ACC be.INF and good officers.ACC REFL.ACC already
confectum senectute.
consume.PTCP.PRF.ACC age.ABL

'He$_i$ denied that it would be expedient to return the prisoners; for, he said, they are young and good officers, while he$_i$ was already consumed with age.' (Cic. Off. 3.100; ex. and translation due to Haug et al., 2017, ex. (2))

Furthermore, LDRs are found in clauses embedded within indirect discourse, provided that the clause is marked with a subjunctive, as in (19).

(19) *Lepta$_i$* *me* *rogat* *[ut,* *[si* *quid* *sibi$_i$* *opus* *sit],*
Lepta.NOM me.ACC asks.IND that if any.NOM REFL.DAT need be.SBJV
accurram]
run.to.SBJV.1P

'Lepta$_i$ asks me to run to him if he$_i$ needs me.' (Cic. Att. 13.48.1; Jøhndal, 2012, ex. (30a), p. 109)

LDRs in indicative clauses within indirect discourse are also occasionally attested. Previously (Solberg, 2011), I considered such indicative examples exceptional. They are, however, predicted to occur by the present account; cf. subsection 5.5.2.

LDRs occur in clauses with the complementizer *quod* and emotive and utterance predicates, as in (20), but I am only aware of examples of *quod*-clauses in the subjunctive. I will return to this issue in subsection 7.3.1.

(20) *Decima* *legio$_i$* *...* *ei* *gratias* *egit* *[quod* *de*
tenth legion.NOM him.DAT thanks.ACC conducted.IND because about
se$_i$ *optimum* *iudicium* *fecisset]* *...*
REFL.ABL excellent judgement.ACC make.PST.PRF.SBJV

'The tenth legion$_i$ thanked him because he had made such a favourable judgement of them$_i$.' (Caes. Gal. 1.41.2; Benedicto, 1991, ex. (5))

Purpose adjunct clauses have interpretational commonalities with indirect discourse, as they involve a purpose, i.e., a specific mental state, on behalf of a discourse-internal participant. It would therefore not be entirely unexpected to find LDRs in purpose clauses, and there have been occasional claims to this effect in the literature (see, e.g., Ros, 2001, p. 258). I briefly discussed this in prior work (Solberg, 2011, p. 18-20), where I expressed some doubts about the possibility of LDRs in adjunct purpose clauses. I will return to this issue in subsection 7.2.4.

2.4.2 Antecedents

In all the examples so far in this overview, the LDRs have been subject-oriented, but this is by no means the only option. LDRs can have antecedents in many different syntactic positions. In (21a), the LDR refers back to a dative argument to an adjectival predicate, and in (21b), to a possessive dative. In (21c) (=(2)), an agent PP to a passivized speech predicate serves as antecedent.

(21) a. *Annali$_i$* *pergratae* *litterae* *tuae* *fuerunt,* *[quod* *...*
Annalis.DAT very.agreeable.NOM letter.NOM your was.IND because
curares *de* *se$_i$* *diligenter]* *...*
worried.SBJV.2SG about REFL.ABL diligently

'Your letter really pleased Annalis$_i$, because you cared a lot about him$_i$.' (Cic. Quint. 3.1.20; Benedicto, 1991, ex. (22))

b. *Iam inde ab initio Faustulo$_i$ spes fuerat [regiam*
already since from beginning Faustulus.DAT hope.NOM was.IND royal
stirpem apud se$_i$ educari].
lineage.ACC before REFL.ACC educate.INF.PASS

'Already from the beginning, Faustulus$_i$ had the hope that someone of royal lineage was being educated with him$_i$.' (Liv. 1.5.5; Benedicto, 1991, ex. (21))

c. *A Caesare$_i$ valde liberaliter invitor ... [sibi$_i$ ut*
by Caesar very graciously invite.PASS.PRS.IND.1SG REFL.DAT that
sim legatus] ...
be.PRS.SBJV.1SG staff.officer.NOM

'I have very graciously been invited by Caesar$_i$ to be his$_i$ staff officer.' (Cic. Att. 2.18.3; Benedicto (1991, ex. (25)))

LDRs in Latin indirect discourse refer back to the author of the indirect discourse, the individual whose words, thoughts or emotional content is reported, regardless of the syntactic position of the nominal constituent representing this individual. In (21a) and (21b), the clauses containing the LDRs depend on non-verbal attitude predicates. The experiencer of these predicates is represented by dative arguments. As the three-place speech predicate is passivized in (21c), the author of the indirect discourse is represented by the agent PP, not the nominative subject. In semantic terms, we can say that LDRs in indirect discourse refer back to the AH associated with the attitudinal complement or stretch of UID in which they occur.

When an instance of indirect discourse containing an LDR is embedded within indirect discourse, the LDR can refer either to the author of the higher or the lower indirect discourse. In (22a) and (22b), a speech verb and its complement is embedded within indirect discourse (UID in these cases), and these complements contain LDRs. The LDR in the deeply embedded complement refers to the lower author of the indirect discourse, *Lentulus*, in (22a), and to the higher, *Pompeius*, in (22b).

(22)

a. *Galli$_i$ ... dixerunt: ... Lentulum$_j$ ... sibi$_i$ confirmasse ...*
Gauls.NOM said.IND Lentulus.ACC REFL.DAT confirme.PRF.INF
[se$_j$ esse tertium illum Cornelium] ...
REFL.ACC be.PRS.INF third.ACC that.ACC Cornelius.ACC

'The Gauls$_i$ said ... Lentulus$_j$ had confirmed to them$_i$ that he$_j$ was that third Cornelius.' (Cic. Cat. 3.9; Kühner and Stegman, 1976/1997a, p. 612)

b. *cum hoc$_j$ Pompeius$_i$ ... vehementer egit, cum diceret ...*
with him Pompeius.NOM firmly spoke.IND when said.SBJV
Hanc si ille$_j$ non servaret, ita laturum ut omnes$_k$
this.ACC if he.NOM not observe.SBJV thus bear.FUT.PTCP that all.NOM
intellegerent [nihil sibi$_i$ antiquius amicitia nostra
understand.SBJV nothing.ACC REFL.DAT older.ACC frienship.ABL our
fuisse].
be.PRF.INF

'Pompeius$_i$ talked firmly with him$_j$, when he said ... If he$_j$ didn't observe this [oath], he$_i$ would act in such a way that everyone$_k$ would understand that nothing is more valuable to him$_i$ than our friendship.' (Cic. Att. 2.22.2)

This is consistent with the generalization that LDRs refer to AHs: Since the LDR is embedded under multiple attitude predicates with different subjects, it is in the attitudinal content of multiple AHs. In this dissertation, I will refer to clauses of indirect discourse embedded under multiple attitude predicates as *deeply embedded indirect discourse*. LDRs in such clauses will also be said to be *deeply embedded*.

The messenger reports mentioned in the introduction appear to be more challenging to the generalizations given above: In examples where messengers speak on behalf of an individual or group, LDRs tend to be directed towards the sender, not the messenger who actually pronounces the message and who often serves as subject for the speech predicate, cf. the examples in (5) and the UID in (23):

(23) *Helvetii$_i$ ... legatos ad eum mittunt; cuius legationis*
Helvetians.NOM messangers.ACC to he.ACC send.IND which.GEN embassy.GEN
Divico$_j$ princeps fuit ... Is$_j$ ita cum Caesare egit:
Divico.NOM leader.NOM was.IND he.NOM thus with Caesar talked.IND
... se$_i$ ita a patribus maioribus=que suis didicisse ut
REFL.ACC so from fathers elders=and their learn.PRF.INF that
magis virtute contenderent quam dolo aut insidiis
more valour.ABL contend.PST.SBJV.3PL than trickery.ABL or plots.ABL
niterentur.
rely.SBJV.SBJV.3PL

'The Helvetians$_i$ sends messengers to him. The leader of this embassy was Divico$_j$. He$_j$ talked with Caesar in these terms: ... They$_i$ had learned from their fathers and their elders that they should rather contend with valour than rely on trickery and plots.' (Caes. Gal. 1.13.2-4;Solberg, 2015, ex. (3a))

In (23), the subject of the speech predicate *egit* is Divico, the leader of the embassy from the Helvetians, but the Helvetians, not Divico, is antecedent for the LDRs in the UID which follows. Since Divico is the utterance agent, it is presumably him, not the Helvetians, who is the AH.

A second problematic case is LDRs in complements to *audio*, 'hear', when what is heard is someone's utterance. In such cases, the antecedent of LDRs can be the source of the perceived utterance, as in (24):

(24) *ibi ego*$_i$ *audivi ex illo*$_j$ *[sese*$_j$ *esse Atticum].*
there I.NOM heard.IND from him REFL.ACC be.INF native.of.Attica.ACC

'There I$_i$ heard from him$_j$ that he$_j$ was a native of Attica.' (Ter. An. 927; Jøhndal, 2012, ex. (77), p. 131)

2.4.3 LDRs and other pronouns

LDRs are not in complementary distribution with other pronouns. (25a) is an example where a personal pronoun in an attitudinal complement is AH referring. A pronoun which more frequently replaces an LDR, is the emphatic pronoun *ipse*, as in (25b) (see Fruyt, 2016, for a detailed study):

(25) a. pro$_i$ *persuadent Rauracis et Tulingis et Latobrigis*
persuade.PRS.IND Rauraci.DAT and Tulingi.DAT and Latobrigi.DAT
finitimis suis [uti ... una cum eis$_i$ *proficiscantur].*
neighbors.DAT their that together with them set.out.SBJV

'They$_i$ persuade their neighbors the Rauraci, the Tulingi and the Latobrigi to set out together with them$_i$.' (Caes. Gal. 1.5.3; Solberg, 2011, ex. (2.47a))

b. *convocato concilio ...* pro$_i$ *vehementer eos*$_j$
convoke.PTCP.PRF.ABL council.ABL vigorously them.ACC
incusavit: ... Aut cur pro$_j$ *de sua*$_j$ *virtute aut de*
accused.IND or why of REFL.POSS.ABL strength or of
ipsius$_i$ *diligentia desperarent?*
PROX.GEN diligence despair.SUBJ.PL

'Having convoked the council, he$_i$ accused them$_j$ vigorously: ... Why should they$_j$ despair either of their$_j$ own strength or his$_i$ diligence?' (Caes. Gal. 1.40.1; Solberg, 2011, ex. (2.49))

In (25b), a possessive reflexive would be grammatical in the place of *ipsius*, but it would have been ambiguous between a local and a long-distance reflexive. The use of a local possessive reflexive in the first conjunct, *de sua virtute*, makes disambiguation even more difficult. But *ipsius*, on the other hand, gives a less ambiguous reading, as this pronoun usually does not take the local subject as its antecedent. Disambiguation is presumably an important reason for the choice of normal pronouns instead of LDRs in many cases, but it cannot explain all attested cases, e.g. (25a).

LDRs are not in complementary distribution with pro-dropped subjects either. AcI subjects referring to the reported speaker/thinker are sometimes pro-dropped. Pro-dropped subjects also frequently occur in indirect discourse subjunctive clauses, but they

do not compete with LDRs in that position, as there is no nominative personal reflexive (Solberg, 2011, p. 45-47).

2.5 LDRs outside of indirect discourse

Some grammars mention that LDRs occasionally also occur in indicative clauses, exemplified in (26), or in subjunctive clauses without an indirect discourse interpretation, such as (3) (Menge 2000, p. 127-128; Kühner and Stegman 1976/1997a, p. 613-614). In my previous work (Solberg, 2011, p. 30-40), I reviewed the examples cited in the literature, of which there were 41 with *se* and 25 with *suus*.[12]

(26)

a. *Volero*$_i$ ... *[ubi indignantium pro se*$_i$
Volero.NOM where indignant.PTCP.PRES.GEN.PL for REFL.ABL
acerrimus erat clamor], eo se in turbam
sharpest.NOM were.IND shout.NOM there REFL.ACC in turmoil
confertissimam recipit ...
densest retreated.IND

'Volero$_i$ retreated to the place in the thick crowd where the cries of those indignant on his$_i$ behalf were the angriest.' (Liv. 2.55.6; Kühner and Stegman, 1976/1997a, p. 614)

b. ... pro$_i$ *ipsam ... ictu calcis occidit, [quod se*$_i$ ...
her.ACC kick.ABL killed.IND because REFL.ACC
conviciis incesserat].
reproaches.ABL attack.PST.PRF.IND

He$_i$ kicked her to death, because she had scolded him$_i$.' (Suet. Nero 35.3; Kühner and Stegman, 1976/1997a, p. 614)

c. ... *Epaminondas*$_i$ ... *ei [qui sibi*$_i$ *ex lege*
Epaminondas.NOM him.DAT who.NOM REFL.DAT from law
praetor successerat] exercitum non tradidit ...
praetor.NOM succeed.PST.PRF.IND army.ACC not transfered.IND

'Epaminondas$_i$ did not transfer the army to the one who had succeeded him$_i$ as a praetor according to the law.' (Cic. inv. 1.55; Kühner and Stegman, 1976/1997a, p. 613)

In (26a) an LDR is found in an indicative correlative clause; in (26b), the embedding clause is an indicative causal adjunct clause, whereas the LDR occurs in an indicative restrictive relative clause in (26c).

Examples like this are puzzling, given the generalizations about long-distance binding in indirect discourse: the clauses in which they occur are not associated with an attitudinal

[12] All the references to the examples are given in the appendix of Solberg (2011, p. 121).

semantics. It is therefore not obvious how they should be captured together with the AH-referring LDRs in indirect discourse.

2.6 Why distinguish between local and long-distance reflexives?

In this dissertation, I will exclusively be preoccupied with LDRs and will not discuss local reflexive binding. I take local reflexives to be an altogether different type of lexical item in Latin, and I assume they get their reference through some syntactic mechanism. There are strong empirical reasons for making this distinction in Latin.

First, when *se* takes a long-distance antecedent, it appears to allow only an animate antecedent, both in attitudinal and non-attitudinal environments. This animacy requirement will be discussed in more detail in subsection 5.8.2. Local reflexives are not restricted to animate antecedents, as the examples in (27) show:

(27)

a. *quae res$_i$ se$_i$ sic habet*
this affair.NOM REFL.ACC so has.IND

'This is how the matter stands.' (Cic. Att. 5.1.3)

b. *... valvae$_i$ ... subito se$_i$ ipsae aperuerunt ...*
doors.NOM suddenly REFL.ACC PROX.NOM opened

'The doors suddenly opened by themselves.' (Cic. Div. 1.74; examples and translations according to Jøhndal, 2012, ex. (2) and (4), p. 101)

The second difference has to do with the distribution of *se* and other pronouns with the same reference. As we saw in (25) above, LDRs are not in complementary distribution with other pronouns. Jøhndal (2012, p. 102) says that local reflexives appear to be in complementary with other pronouns.

The third and final difference is the syntactic restrictions on the antecedent. According to Jøhndal (2012, p. 102), there are good reasons for assuming that local reflexives are obligatorily subject-oriented. As we have seen in (21), LDRs do not necessarily take subjects as their antecedents.

When local and long-distance uses of *se* are distinguished so sharply, it is relevant to ask where the line of demarcation should be set. I consider reflexives to be LDRs if they find antecedents outside of their minimal finite clause or AcI. Reflexives which find their antecedent outside of other non-finite structures will not be considered here.

As we saw in subsection 2.3.2, subjunctive clauses and AcIs in indirect discourse share many properties. However, since AcIs have a non-finite verb form, it might be tempting to take the local binding domain of reflexives to extend into AcIs. Another possibility is that only the accusative subject position of an AcI is transparent to local binding.[13]

[13]This second option was suggested to me by Isabelle Charnavel, p.c.

For example, the subject position of an exceptional case-marked (ECM) clause is usually assumed to be transparent to local reflexive binding (see, e.g., Reinhart and Reuland, 1993, section 7). A local analysis of *se* in AcIs with an extra-clausal antecedent is not supported by the data, however, even when the reflexive is an accusative subject. There are two main reasons for this.

First, LDRs in AcIs, like subjunctive clauses, can take non-subject and non-c-commanding antecedents. (28) (=(24)) is an example of this. Note that the LDR is the accusative subject of the AcI:

(28) *ibi ego*$_i$ *audivi ex illo*$_j$ *[sese*$_j$ *esse Atticum].*
there I.NOM heard.IND from him REFL.ACC be.INF native.of.Attica.ACC

'There I$_i$ heard from him$_j$ that he$_j$ was a native of Attica.' (Ter. An. 927; Jøhndal, 2012, ex. (77), p. 131)

Second, LDRs occur in AcIs in UID. Since UID clauses are root clauses, there is no possibility for the reflexive to be locally bound. (29) (=(18b)) illustrates this. Again, the reflexive is the subject of the AcI:

(29) pro$_i$ *reddi captivos negavit esse utile; illos*
return.INF prisoners.ACC denied.IND be.INF useful they.ACC
enim adulescentes esse et bonos duces, se$_i$ *iam*
for young.ACC be.INF and good officers.ACC REFL.ACC already
confectum senectute.
consume.PTCP.PRF.ACC age.ABL

'He$_i$ denied that it would be expedient to return the prisoners; for, he said, they are young and good officers, while he$_i$ was already consumed with age.' (Cic. Off. 3.100; ex. and translation due to Haug et al., 2017, ex. (2))

2.7 Cross-linguistic data and the role of perspective

AH-referring LDRs in indirect discourse are well-attested cross-linguistically; they are found in (among other languages) Mandarin, Japanese, Tamil and Icelandic (see, e.g., Huang and Liu, 2001; Sells, 1987; Sundaresan, 2012; Maling, 1984). In Icelandic, LDRs are restricted to subjunctive-marked indirect discourse for most speakers. In (30) I list some representative examples (glosses and translations according to the cited sources):

(30)

a. *[Ziji*$_i$*-de xiaohai mei de jiang]-de xiaoxi shi Lisi*$_i$ *hen shangxin.*
REFL-GEN child not get price-DE news make Lisi very sad

'[The news that his$_i$ child didn't win the prize] made Lisi$_i$ very sad.' (Mandarin; Huang and Liu, 2001, ex. (35b))

b. *[Yosiko-ga zibun$_i$-o nikundeiru koto]-ga Mitiko$_i$-o zetuboo e*
Yosiko-SBJ REFL-OBJ be.hating COMP-SBJ Mitiko-OBJ desperation to
oiyatta.
drove

'[That Yosiko hated her$_i$] drove Mitiko$_i$ to desperation.' (Japanese; Sells, 1987, ex. (29))

c. *[Seetha tann-æ$_i$ verŭ-tt-aaḷ enbadŭ] Krishnan-æ$_i$ rombæ*
Seetha.NOM REFL-ACC hate-PST-3FSG that.NOM Krishnan-ACC very
kašṭappaḍŭtt-iɟ-adŭ.
bother-PST-3MSG

'[That Seetha hated him$_i$] bothered Krishnan$_i$ very much.' (Tamil; Sundaresan, 2012, ex. (30))

d. *Skoðun Siggu$_i$ er [að sig$_i$ vanti hæfileika].*
opinion Sigga.GEN$_i$ is that REFL lacks.SBJV ability

'Sigga$_i$'s opinion is [that she$_i$ lacks ability].' (Icelandic; Maling, 1984, ex. (23))

I have purposely chosen examples where the antecedent of the LDR is not a subject to illustrate that LDRs are not obligatorily subject-oriented. In the Mandarin example in (30a), the antecedent of the LDR, *Lisi*, is the object of a complex predicate meaning *make very sad*. The LDR can take this antecedent, according to Huang and Liu (2001, p. 156), because the subordinate clause reports a mental state of Lisi. A very similar pattern is seen in the Japanese example in (30b). The Tamil example in (30c) has an LDR in a subject clause to a verb meaning 'bother'. The accusative-marked experiencer of the bothering is the antecedent. Finally, the Icelandic example in (30d) has an LDR in the complement to a nominal mental state predicate, with the experiencer and LDR antecedent realized as a genitive.

In some of these languages, LDRs can take discourse antecedents in environments which might be analyzed as instances of UID. I will return to this in section 6.6.

Some languages with LDRs in attitudinal environments also have LDRs in certain non-attitudinal cases. This is the case, e.g., in Japanese and Tamil (Kuno and Kaburaki, 1977; Iida, 1996; Oshima, 2007; Nishigauchi, 2014; Sundaresan, 2012). Charnavel (2016) reports that the French emphatic personal reflexive *lui-même* 'himself' and *son propre* 'his/her own' can be used as AH-referring LDRs in indirect discourse, but also have a long-distance use in certain other environments. The following Japanese example is a typical case:

(31) *John$_i$-wa [zyuunen mae ni Mary-ga zibun$_i$-o tazunete kita] ie de*
John-TOP ten.years.ago Mary-NOM REFL-ACC visiting came house in
imawa koohukuni kurasite imasu.
now happily living is

'John$_i$ now lives happily in the house where Mary came to visit him$_i$ ten years ago.' (Japanese; example, glosses and translation according to Kuno and Kaburaki, 1977, ex. (34a))

When the verb *kuru* 'come' is used in a subordinate clause, the superordinate subject becomes an available antecedent for the reflexive *zibun*.

To account for this wider distribution, it has been common in the literature to link LDR binding to linguistic perspective and perspective shift (Kuno and Kaburaki, 1977; Sells, 1987; Iida, 1996; Oshima, 2007; Sundaresan, 2012; Bylinina et al., 2014; Charnavel, 2016, a.o.). Perspectival expressions such as *foreigner, to the left of, interesting* etc. are by default interpreted relative to the speaker. In attitudinal environments, they can optionally be shifted to the AH. The following pair of sentences illustrates this:

(32)

a. John is a foreigner. (I.e., he is a foreigner with respect to me)

b. Mary thinks that John is a foreigner. (I.e., he is a foreigner with respect to me or Mary) (examples from Bylinina et al., 2014, ex. (6b) and (24b))

Perspective shift does, however, take place in other, non-attitudinal environments, and in certain languages, LDRs can pick up non-attitudinal shifted perspective holders (see Bylinina et al., 2014 for an overview of perspectival phenomena and the relevant literature). Japanese is much discussed in this respect. A number of predicates in Japanese are triggers of perspective shift. The verb pair *yaru* and *kureru* illustrates this.[14] Both can either be used as lexical verbs meaning 'give' or as benefactive auxiliaries. In both uses, they differ with respect to perspectival requirements. With *yaru*, the perspective is neutral (i.e., the speaker is the perspective holder) or the point of view is that of the subject. With *kureru*, however, the perspective is shifted to the dative argument (see, e.g., Kuno and Kaburaki, 1977; Nishigauchi, 2014; Oshima, 2007). This has consequences for the binding of *zibun*: It can be long-distance bound with *kureru*, as in (33a), but not with *yaru*, as in (33b):

(33)

a. *Taroo$_i$-wa [Hanako-ga zibun$_i$-ni kasite* kureta*] okane-o tukatte*
Taroo-TOP Hanako-NOM REFL-DAT lending gave money-ACC spending
simatta.
ended.up

'Taroo$_i$ has spent all the money [that Hanako had lent him$_i$].'

[14]Similarly, *kuru* 'come' is a trigger of perspective shift, cf. (31) (Kuno and Kaburaki, 1977).

b. *Taroo$_i$-wa [Hanako-ga zibun$_i$-ni kasite* yatta*]* *okane-o tukatte*
Taroo-TOP Hanako-NOM REFL-DAT lending gave money-ACC spending
simatta.
ended.up

'Taroo$_i$ has spent all the money [that Hanako had lent him$_i$].' (Japanese; examples, glosses, judgements and translation according to Kuno and Kaburaki, 1977, ex. (30) a and b)

(33a) can have a dative long-distance reflexive because *kureru* is used, which shifts the perspective to the dative argument. The same example with *yaru* is ungrammatical, as (33b) shows.

(34a), (34b) and (34c) illustrate the same contrast with a typical perspectival expression, *migigawa* 'to the right'. In (34b) and (34c), *yaru* and *kureru*, respectively, are used as benefactive markers (Oshima, 2007, p. 26-27; Nishigauchi, 2014) In (34a), no benefactive marker is used:

(34)

a. *Taro$_i$-wa Hanako$_j$-ni teeburu-no migigawa-no otoko-o syookai-si-ta*
Taro-TOP Hanako-DAT table-GEN right-GEN man-ACC introduce-PST

'Taro$_i$ introduced to Hanako$_j$ the man to the right of the table from his$_i$/ $^{?}$her$_j$/ my/ your viewpoint'

b. *Taro$_i$-wa Hanako$_j$-ni teeburu-no migigawa-no otoko-o syookai-site-yat-ta*
Taro-TOP Hanako-DAT table-GEN right-GEN man-ACC introduce-BEN-PST

'Taro$_i$ introduced to Hanako$_j$ the man to the right of the table from his$_i$/ $^{?*}$her$_j$/ $^{(?)}$my/ $^{(?)}$your viewpoint, for his$_i$ sake'

c. *Taro$_i$-wa Hanako$_j$-ni teeburu-no migigawa-no otoko-o syookai-site-kure-ta*
Taro-TOP Hanako-DAT table-GEN right-GEN man-ACC introduce-BEN-PST

'Taro$_i$ introduced to Hanako$_j$ the man to the right of the table from $^{?*}$his$_i$/ her$_j$/ $^{?}$my/ $^{?}$your viewpoint, for her$_j$ sake' (Japanese; examples, glosses, judgements and translations from Oshima, 2007, ex.s (21a-c))

In (34a), where no benefactive marker is used, *to the right* can be interpreted from the speaker or addressee's perspective as well as from the subject Taro's perspective. The dative argument, *Hanako*, is less optimal as a reference point for the perspectival expression. The benefactive marker *yaru* in (34b) indicates that the event took place for the sake of the subject (i.e., *Taro*), and Taro becomes the optimal perspective holder for *to the right*. Finally, in (34c), *kureru* asserts that the benefactive is the dative argument, *Hanako*, and she becomes the perspective holder.

Non-attitudinal LDRs in Tamil and French have also been shown to be sensitive to perspective (Sundaresan, 2012; Charnavel, 2016), and perspective shift has been appealed to in the explanation of LDRs more generally (e.g., Sells, 1987). The argument has been made for non-attitudinal LDRs in Latin too (Bertocchi, 1989, 1994; Solberg, 2011;

Jøhndal, 2012), based on the comparison with Japanese data. As I will return to in section 5.8, it is virtually impossible to establish conclusively that Latin LDRs are sensitive to perspective, as the crucial non-attitudinal examples are too infrequent. Given the cross-linguistic data, however, it appears to be a reasonable hypothesis.

It is important to note the explanatory potential of perspective shift: If LDRs are sensitive to perspective shift, it is clear why they refer to the AH in indirect discourse, as indirect discourse is an environment of perspective shift (cf. the contrast in (32)). It would also explain why reflexives take long-distance antecedents in non-attitudinal environments, as perspective shift is not restricted to clauses with an attitudinal interpretation.

Why, we should still ask, are LDRs sensitive to perspective shift, not simply to perspective? Or put differently, why can't they pick up the speaker in non-shifting environments? For a language like Latin, an answer readily presents itself: LDRs are third-person, and participants in the utterance context are therefore excluded as antecedents on independent grounds. In Mandarin and Japanese, where reflexives are not third-person, speaker-referring reflexives are possible (Huang and Liu, 2001, sect. 3.2.1; Nishigauchi, 2014, p. 159; Bylinina et al., 2014, p. 3).

We saw in the previous section that there are strong empirical reasons for treating local and long-distance reflexives differently. I noted that a syntactic explanation was probably called for in the case of local reflexives, while I will argue for a semantic, perspective-based analysis of LDRs. Iida (1996) proposes a unified perspectival account of local and long-distance reflexives in Japanese. While an account along such lines might work well for the Japanese data, it cannot be generalized to Latin. As will be discussed in more detail in section 5.8, perspective holders must be animate. However, as the examples in (27) show, local reflexives in Latin can take inanimate antecedents.

2.8 Lexical items with a comparable reference to LDRs

In addition to perspectival expressions, it is relevant to mention two other types of lexical item with some resemblance to LDRs. The first type is that of logophoric pronouns, which are found in a number of West African languages, of which Ewe is most discussed (e.g., Clements, 1975; Culy, 1994; Schlenker, 2003; Pearson, 2015a). The parallel between logophors and Latin LDRs was suggested already by Clements (1975) in a classical article on logophors in Ewe, and logophoricity is frequently appealed to in the literature on LDRs, as we will see in the following chapter. Logophors are pronouns which are restricted to indirect discourse, and which refer back to the AH. They take the same antecedents as Latin LDRs in indirect discourse, in other words. Logophors are distinct lexical items from reflexive pronouns, however. In the Ewe example in (35), the logophor *yè* occurs in a complement to a speech verb. It can only refer to the reported utterance agent, as the indices indicate:

(35) *Kofi*$_i$ *be* *yè*$_{i,*j}$*-dzo.*
Kofi say LOG-leave

'Kofi$_i$ said that he$_{i,*j}$ left.' (Ewe; example, glosses and translation according to Clements 1975, p. 142)

In a certain sense, the parallel between logophors and LDRs is more striking than the one between LDRs and perspectival expressions. Logophors and LDRs are pronouns, and their primary function in the sentence is to refer back to an antecedent. Perspectival expression are not pronouns, but expressions which need a reference point to be interpreted. There is a crucial difference between LDR and logophors, however: logophors are truly restricted to attitudinal environments, and there are no attested counterexamples to this generalization (see, e.g., Sells, 1987; Culy, 1994, 1997).

Another type of lexical item with behavior comparable to that of LDRs is shifted first person indexicals, found in a number of languages, including Amharic, Zazaki, Slave and Nez Perce (Schlenker, 2003; Anand and Nevins, 2004; Deal, 2014). first person pronouns, as well as some other indexicals, can optionally be shifted to the AH in indirect discourse, as the following Zazaki example illustrates:

(36) *Hɛseni*$_i$ *va* *kɛ* *ɛz*$_{i/me}$ *dɛwletia.*
Hesen.OBL said that I rich.be.PRS

'Hesen said that {I am/Hesen is} rich.' (Zazaki; example, glosses and translation according to Anand and Nevins, 2004, ex. 4)

The embedded first person pronoun can either have standard speaker reference or refer back to *Hesen*, the subject of the attitude verb.

Shifted first person pronouns have a similar behavior to logophors and LDRs in that they pick up the AH in attitudinal environments. Like logophors, shifted indexicals are nearly exclusively attested in indirect discourse.[15]

There is a parallel between shiftable first person pronouns and perspectival expressions, as they both have a default first person reference. However, they are distinct phenomena which should be kept apart: shifted first person pronouns are only attested in certain languages, while perspective shift appears to be a much more general phenomenon.

2.9 Summary

In this chapter we have looked at the core phenomena which will be studied in this dissertation. We have seen that Latin LDRs frequently occur in indirect discourse, both in attitudinal complements and UID, where they refer back to the AH. When an LDR is embedded under multiple attitude predicates, it can refer to the AH of any of the superordinate predicates. A theory of long-distance reflexivity must account for the AH-reference in indirect discourse and the ambiguity. It must also provide some explanation of the referential pattern in messenger reports. I have also briefly mentioned to two other AH-referring pronouns which figure in the theoretical literature on LDRs: logophors and shifted first person pronouns.

While explaining the behavior of LDRs in indirect discourse, a theory of LDRs must also make sense of LDRs in non-attitudinal environments. Cross-linguistic data suggests

[15] Action role shift in American Sign Language and French Sign Language is the only attested case of indexical shift outside of attitudinal environments, according to Schlenker (2015, p. 33).

a connection between LDRs and perspective shift in non-attitudinal environments. Since perspective shift also takes place in indirect discourse, an account in these terms seems like a promising path to explore. As we will see in the next chapter, perspective figures prominently in the theoretical literature on long-distance reflexivity.

Chapter 3

Long-distance reflexivity: A semantic challenge

3.1 Introduction

The previous chapter presented the core patterns of long-distance reflexivity in Latin. In this chapter, I will make precise what expectations I have of a semantic theory of long-distance reflexivity, and evaluate some important existing approaches with respect to those expectations. Based on this evaluation, I will lay out the fundamentals of my own analysis: an anaphoric account of LDRs and an event-semantic approach to perspective shift embedded within a dynamic semantic framework.

Section 3.2 shows that the LDR-antecedent relationship cannot be treated as a purely structural relation. In section 3.3, I will formulate, in the form of four desiderata, my expectations for a semantic theory of LDRs. These desiderata will guide the discussion of some prominent previous semantic approaches to the phenomenon in section 3.4. Section section 3.5 will summarize some key points of the discussion and present the basics of the account presented in this dissertation.

3.2 The LDR-antecedent relationship is not structural

In the previous literature on LDRs, it is possible to identify two main groups of accounts. The first group consists of accounts which take into consideration the semantics of indirect discourse and other environments in which LDRs are found. The second group attempts to capture the LDR-antecedent relationship in purely structural terms, through some extension of Binding Theory (cf. section 1.1). The present work is firmly placed in the first group, as is most of the current theoretical literature on LDRs, because purely structural accounts cannot fully capture the relationship between the LDR and the antecedent. In this section, I will lay out briefly why that is the case. I will not discuss the different versions of Binding Theory accounts in detail, but I refer the reader to Sundaresan (2012, sect. 2.3.1) for a good review of this literature.

As we saw in section 1.1, Binding Theory requires reflexives to be bound in their local domains. One way of capturing reflexives with long-distance antecedents in Binding

Theory is therefore to extend the local domain. The syntactic analysis of Latin LDRs proposed by Benedicto (1991) is an approach along these lines. Benedicto argues that the local domain for reflexive binding can be extended through chain formation. Previously (Solberg, 2011) I showed that Benedicto's account neither manages to capture the distribution nor the antecedence options of LDRs in Latin. Another possibility is to account for long-distance reflexivity in terms of covert movement, with the reflexive pronoun moving out of its local domain at LF to a position where it is in a local configuration with the antecedent. Movement approaches of this kind have been proposed by Cole et al. (1990), Huang and Tang (1991) and others. A key difficulty with such accounts is that they cannot fully account for the antecedence options of LDRs: according to Binding Theory, an antecedent must c-command the reflexive, i.e., the reflexive must be the sister of the antecedent in the phrase structure tree, or the reflexive must be embedded in the antencedent's sister. There are frequent examples of LDRs not being c-commanded by their antecedents. Sundaresan mentions in particular so-called *backward binding*, where the LDR is embedded within a clausal subject, as in the Tamil example in (37a) (=(30c)). In Latin, the antecedent of an LDR is sometimes found within a PP, e.g., an agentive PP of a passivized utterance predicate, as in (37b) (see also (2)) or a source PP with a verb of hearing, cf. (24):

(37)

a. *[Seetha tann-æ$_i$ verŭ-tt-aa] enbadŭ] Krishnan-æ$_i$ rombæ*
Seetha.NOM REFL-ACC hate-PST-3FSG that.NOM Krishnan-ACC very
kašṭappaḍŭtt-ij-adŭ.
bother-PST-3MSG

'[That Seetha hated him$_i$] bothered Krishnan$_i$ very much.' (Tamil; example, glosses and translation according to Sundaresan, 2012, ex. (30))

b. *... rogatus sum a ... matre$_i$ tua ... [ut*
asked.PTCP.PRF.NOM is.IND.1SG by mother your that
venirem ad se$_i$] ...
come.SBJV.1SG to REFL.ACC

'I was asked by your mother$_i$ to come to her$_i$' (Cic. ad Brut. 24.1; Menge, 2000, p. 127)

In (37a) the clausal subject containing the LDR c-commands the accusative antecedent in the matrix clause, not the other way around. In (37b), the PP containing the antecedent might be argued to c-command the antecedent. However, the antecedent itself does not, as it is embedded within the PP and is therefore not in a sisterhood relationship with the clause containing the LDR.

The examples in (37) show that c-command cannot fully account for the LDR-antecedent relationship. They do not conclusively show, however, that the relationship cannot be explained in terms of some other structural relationship. One group of examples that resists explanation in structural terms is LDRs with discourse antecedents in UID, discussed in subsection 2.4.1. In such examples the LDR and the antecedent are found in

altogether different sentences, and therefore, there cannot be a structural relationship between the two. As we will see in section 6.6, this is by no means a Latin-specific issue. LDRs with discourse antecedents are found in several other languages. The fact that the LDR-antecedent relationship cannot be fully captured as a structural relationship does not necessarily mean that structure has no place in a theory of long-distance reflexivity. Several of the semantically based accounts reviewed in section 3.4 do include a structural component.

3.3 What should a semantic theory of long-distance reflexivity account for?

To guide the discussion of the previous research and my own proposal, I propose the following list of desiderata for a semantic theory of long-distance reflexivity:

Desiderata for a semantic theory of long-distance reflexivity:

DES1 The theory should account for the AH-reference of LDRs in indirect discourse

DES2 It should make sense of the ambiguity of LDRs in deeply embedded indirect discourse

DES3 It should be possible to give an insightful account of LDRs with extra-sentential antecedents

DES4 It should be possible to extend the theory in a plausible way to instances of LDRs in non-attitudinal environments

Since LDRs in indirect discourse refer to the AH, regardless of the syntactic position of the antecedent, the semantics of LDRs and the semantics of indirect discourse must interact in some way. DES1 addresses this interaction. However, the theory should also make sense of the fact that LDRs are found in non-attitudinal environments, cf. DES4. There are different ways of modelling the pronoun-antecedent relationship. DES2 specifies that this relationship must be set up in such a way that the ambiguity of LDRs in deeply embedded indirect discourse is accounted for. DES3 also puts restrictions on the type of pronoun-antecedent relationship, as cross-sentential binding must be allowed. Furthermore, the account of LDRs should be paired with an account of the environment where such extra-sentential antecedents occur.

One issue which is not in the list is why the reflexive pronoun is ambiguous between a local reflexive and an LDR in many languages. While this is an important and non-trivial question, it goes somewhat beyond the semantic issues of long-distance reflexivity, as it presupposes both a syntactic account of local reflexivity and a detailed story of the syntax-semantics interface. It will therefore not be dealt with in detail in this dissertation.

Another issue not included in the desiderata is accounting for the somewhat surprising antecedents of LDRs in messenger reports. This phenomenon is to my knowledge only described for Latin and is genuinely new to the theoretical discussion. For that reason, it

will not be part of the evaluation of previous approaches to LDRs, and I have therefore not included it in the desiderata. One of the contributions of this dissertation will be the account of LDRs in this environment, given in chapter 7. Such examples are of significance to the analysis of LDRs, and it is my hope that they will be part of the theoretical discussion of LDRs in the future.

3.4 Previous semantic accounts of long-distance binding

3.4.1 Accessing the AH: Centred worlds

DES1 addresses the issue of the AH-reference of LDRs. Before discussing concrete analyses of long-distance binding, I will show why AH-reference in indirect discourse is not trivial to account for, and briefly present a prominent solution, namely centred worlds semantics.[16] In my own analyses in chapters 5-7, I will account for the AH-reference of LDRs in a different way, but centred worlds semantics is so prominent in the theoretical discussion that it deserves an introduction.

As we saw in subsection 2.3.1, indirect discourse is characterized by an AH-relative interpretation. The standard way of accounting for this, following Hintikka (1969), is to consider attitude predicates to be quantifiers over possible worlds (I abstract away from times here and in the following). The proposition of the complement clause is bound by the world quantifier:

(38) **Hintikkan semantics for *believe***
$[[believe]]^{M,a} = \lambda P.\lambda x.\lambda w.\forall w' \in DOX_{x,w}.P(w')$
where $DOX_{x,w}$, the *doxastic alternatives of* x *in* $w = \{w'|w'$ is compatible with x's beliefs in $w\}$

The predicate universally quantifies over worlds in the set of *doxastic alternatives* or belief alternatives of the AH in the superordinate world, and states that the complement proposition holds in those worlds. The interpretation of the complement is, in other words, relativized to the AH. Consider the example in (39):

(39) John believes that it is raining.

As long as it is raining in John's belief worlds, (39) is true, regardless of whether it is actually raining. With the denotation in (38), we correctly predict this reading:

(40) $[[believe]]^{M,a}([[it\ is\ raining]]^{M,a})([[John]]^{M,a}) = \lambda w.\forall w' \in DOX_{John,w}.raining(w')$

It must rain in all worlds in the doxastic alternatives of John, but not necessarily in w.

Complements to other attitude predicates are AH-relative in similar ways, with the set of attitudinal alternatives containing worlds compatible with the AH's assertion, wish,

[16] This overview is to a large extent based on Pearson (2013, 2015a).

hope etc. Factive attitudinal predicates such as *know* have a similar semantics, but are also associated with a veracity presupposition (Kiparsky and Kiparsky, 1970; Anand and Hacquard, 2014).

A number of lexical items such as *PRO*, logophors, shifted first person pronouns and LDRs, pick up the AH in indirect discourse. This referential possibility cannot be modelled in a Hintikkan semantics: Given the denotation in (38), the AH is not semantically represented in the complement proposition, only the belief world w'. One cannot figure out who the AH is on the basis of a world variable. A world is not unique to an individual; it can be consistent with the attitudes of different individuals or no individual. A common way to account for the reference of AH-referring items is to draw on a so-called *centred worlds* semantics (see Chierchia, 1989; Schlenker, 2003; Anand and Nevins, 2004; Pearson, 2015a, and many others).

Centred worlds semantics originates from the observation that there is a way of interpreting AH-referring expression in attitude reports, *de se* readings, alongside the more familiar *de re* and *de dicto* readings (cf. Castañeda, 1966; Perry, 1977, 1979; Lewis, 1979; Kaplan, 1989, a.o.). The distinction between *de se* and *de re* reference becomes apparent in certain kinds of mistaken identity scenarios, like that of Hannah Phillips from Wales:

> A Welsh woman who spitefully mocked a "fat bird" wearing the same top as her started running every other day when she realised she was actually seeing herself in a mirror.
>
> Hannah Phillips, 30, from Merthyr Tydfil was on a night out with her now husband when her mockery backfired and she realised she had put on weight, which has led to her publishing a book about her running experiences.
>
> She explained: "I said to him 'that fat girl's got my top on, and she's got my green jeans on as well'. He didn't know what I was on about and then I realised it was a mirror and I was that fat girl.
>
> "I didn't realise I had got that chubby. I was so traumatised we went home straight away and I drank a whole bottle of wine on the train home."[17]

In this story Hannah Phillips entertains two different beliefs, which prompt two different kinds of reactions. Her first belief can be rendered in direct speech as "that girl in the mirror is fat". This is a *de re* belief about an individual, who turns out to be herself. The *de re* belief prompts her to make mocking comments.

The second belief is formed when she realizes that she is in fact that girl in the mirror, and can be rendered by a direct speech report with a first person pronoun: "I am fat". Such beliefs, in which the AH is aware that the belief is about herself, are called *de se* beliefs. Her *de se* belief prompts a rather different behavior from the *de re* belief: she drinks a bottle of wine on the train home and starts running every second day.

In direct speech, the *de se* reading can be made explicit by the use of a first person pronoun. The distinction is lost when a third person pronoun is used in indirect reports in English:

[17] www.walesonline.co.uk/news/local-news/woman-who-mocked-fat-bird-9903622

(41) Hannah$_i$ believes that she$_i$ is fat.

(41) is an adequate report of the *de se* belief: Hannah believes that she, i.e., the person she recognizes as herself, is fat. It can also report the *de re* belief, however: Hannah believes that she, i.e., the woman she sees in the mirror, who happens to actually be herself, is fat.

There are, however, obligatorily *de se* elements in attitude complements. *PRO* has an obligatorily *de se* interpretation when used after attitude predicates (see, e.g., Chierchia, 1989). Logophors and shifted indexicals have also been reported to be obligatorily *de se* elements (Schlenker, 2003; Anand and Nevins, 2004, a.o.).[18]

Lewis (1979) pointed out that a possible worlds semantics is not quite enough to account for attitudes *de se*. While Lewis' paper is concerned with attitudes generally, I will focus specifically on attitude reports here. Doxastic alternatives modelled as a set of worlds are not sufficient to represent attitudes *de se*. In order to do that, it is also necessary to pick out the individual the AH identifies as herself in those worlds. Lewis obtains this by redefining the object of attitudes as properties: from a set of worlds, it is possible to construct a corresponding property, that of inhabiting a world in the set. Consequently, a property can be formed from a proposition, namely that of inhabiting a world in which the proposition is true. We can capture this if we assume that attitude predicates quantify not over worlds, but over *centred worlds*, world-individual pairs $\langle w', y\rangle$ such that it is compatible with the AH's attitude for her to be y in w'. The individual variable of this pair is often referred to as the *center*.

A centred worlds version of the belief predicate will be as follows:

(42) **Centred worlds semantics for *believe***
$[[believe]]^{c,a} = \lambda P_{\langle\langle s,e\rangle,t\rangle}.\lambda x.\lambda w.\forall\langle w', y\rangle \in DOX_{x,w}.P(y)(w')$
where $DOX_{x,w} = \{\langle w', y\rangle|$ It is compatible with what x believes in w for x to be y in $w'\}$ (Pearson, 2013, ex. (6))

The complement of *believe* is not a proposition but a property, an entity of type $\langle\langle s, e\rangle, t\rangle$. This property must hold in the set of world-individual pairs $\langle w', y\rangle$ for which w' is the belief world and y is the individual that the AH recognizes as herself in w'.

With this semantics we can represent the *de se* reading of (41):

(43) [[Hannah$_i$ believes$_{de\ se}$ that she$_i$ is fat.]] = $\lambda w.\forall\langle w', y\rangle \in DOX_{Hannah,w}.y$ is fat in w'

If Hannah believes *de se* that she is fat, (43) is true, because the formula states that y, the individual Hannah recognizes as herself in her belief worlds, is fat in those worlds. It is false on the *de re* reading, however: y cannot be the person Hannah sees in the mirror and mocks for being fat, because that individual is not Hannah herself in Hannah's belief worlds.[19]

[18] Hazel Pearson's fieldwork shows, however, that logophors in Ewe are not obligatorily interpreted *de se* (Pearson, 2015a).

[19] Accounting for *de re* readings in mistaken identity contexts is far from a trivial matter (see, e.g., Quine, 1956; Cresswell and von Stechow, 1982; Percus and Sauerland, 2003; Maier, 2009a). The analysis

With a semantics of this kind, it is possible to model obligatory AH-reference, since there is an individual variable representing the AH in the attitudinal complement. If a lexical item is center-referring, it is predicted that it has an obligatorily *de se* reading.

There are a number of ways to account for *de se* reference formally. One possibility is that obligatorily *de se* elements turn propositional complements into properties. Chierchia (1989) argues along those lines for *PRO*, and as we will see, a similar line of argument has been made for LDRs. A second possibility, explored by Pearson (2013), is that all attitudinal complements denote properties, regardless of whether they contain *de se* expressions.

A related way of accounting for *de se* semantics, namely the so-called monstrous account of Schlenker (2003), should also be mentioned in this context. In this framework, attitudinal complements do not denote propositions, but sets of Kaplanian contexts:

(44) a. Syntax:
If ϕ is a well-formed formula, if c_i is a context variable, and if α', β', γ' are respectively an individual, a time and a world term, then $SAY_{\langle\alpha',\beta',\gamma'\rangle}c_i\phi$ is a well-formed formula.

b. Semantics:
$[[SAY_{\langle\alpha',\beta',\gamma'\rangle}c_i\phi]]^{c,a} = 1$ iff for all c' compatible with the claim made by $[[\alpha']]^{c,a}$ at time $[[\beta']]^{c,a}$ in world $[[\gamma']]^{c,a}$:$[[\phi]]^{c,a[c_i \to c']} = 1$ (Schlenker, 2003, ex. (58a and b))

Rather than quantifying over worlds, as in (38), or world-individual pairs, as in (42), the utterance predicate in (44) quantifies over utterance contexts compatible with the subject's claim in a given world at a given time.

From a context variable, contextual coordinates can be deduced, such as an utterance agent, an utterance time and an utterance world:

(45) C, the set of contexts, is non-empty, and furthermore if $c \in C$:

a. $c_A \in X$ (the agent of c)

b. $c_T \in T$ (the time of c)

c. $c_W \in W$ (the world of c) (Schlenker, 2003, p. 110)

As in the property account, the AH is represented in the complement clause, namely as the agent c'_A of a reported context c'. Schlenker uses this semantics to account for logophors and shifted indexicals, and it has also been suggested for LDRs by Oshima (2007) as well as Solberg (2011, chapter 5).

Below follows a discussion of a some representative analyses of LDRs. Latin does not figure prominently in the discussion of the semantics of LDRs, and most of these accounts

of Maier (2009a) is to a large extent compatible with the semantics I will argue for in later chapters. On Maier's account, framed in Discourse Representation Theory, *de se* is a special case of *de re*. The distinct readings of (41) are a byproduct of the anaphoric resolution of the pronoun. *De re* resolutions involve a relation of acquaintance between the center and the antecedent of the anaphor. In the *de se* case, the acquaintance relation is simply equality, while in the *de re* case, it is some other contextually given relation, e.g., $see\_in\_mirror(x, y)$.

therefore focus on other languages. In the last subsection, I will review relevant points from the previous linguistic literature on Latin LDRs.

3.4.2 Reflexives as property abstractors

A particularly transparent example of an analysis of LDRs using centred worlds semantics comes from Huang and Liu (2001). I mentioned in section 3.2 that there exist purely structural accounts of long-distance reflexivity which analyze long-distance binding in terms of covert movement: the LDR moves at LF to a position where it can be locally bound by the antecedent. Huang and Liu (2001) retain the idea that long-distance binding is a consequence of covert movement, but they reject the local binding of the reflexive. Instead, the LDR-antecedence relationship is accounted for semantically: the movement of the reflexive results in individual abstraction and a property interpretation of attitudinal complements.

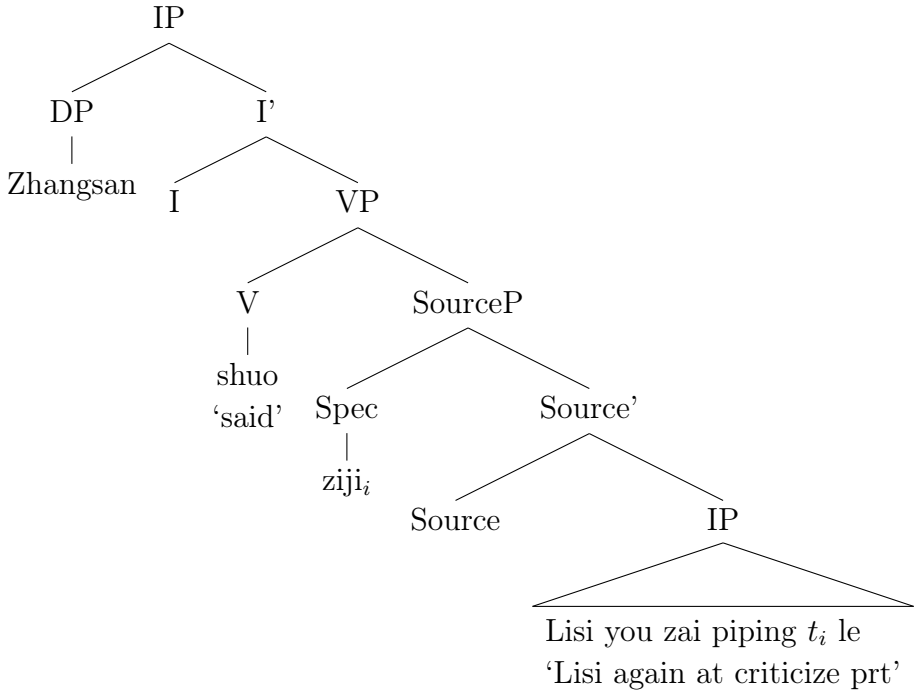
Following Rizzi (1997), Huang and Liu assume that the complementizer field of attitudinal complements is split into multiple functional projections. One of these is the *SourceP*. A non-locally bound instance of *ziji* can undergo covert movement to the specifier position of this projection:

(46)

a. *Zhangsan$_i$ shou Lisi you zai piping ziji$_i$ le*
Zhangsan say Lisi again at criticize REFL prt

'Zhangsan$_i$ said that Lisi was again criticizing him$_i$.' (Mandarin; example, glosses and translation according to Huang and Liu, 2001, ex. (93))

b.



(Huang and Liu, 2001, ex. (95))

Ziji in (46b) moves from inside the IP of the complement clause to the specifier of $SourceP$, leaving behind a trace.

This syntactic representation translates into an LF representation where the reflexive is a lambda operator binding the trace:

(47) shuo [Zhangsan, λx[Lisi you zai piping x le]] (Huang and Liu, 2001, ex. (96))

Due to the individual abstraction, the complement is converted from a proposition to a property. Adopting certain assumptions from Chierchia (1989), the complement is interpreted as a *de se* property of the subject, along the lines described in subsection 3.4.1.

When one analyzes LDRs based on a centred worlds semantics, like Huang and Liu do, it is immediately clear why LDRs in indirect discourse come to refer to the AH, cf. DES1: they do so because the LDR is bound by the center. An obligatorily *de se* reading of the LDR is predicted, which appears to be correct for Mandarin (cf. Huang and Liu, 2001, sect. 3.2.3.). This is a relatively simple and elegant account of AH reference, provided that covert movement is found acceptable.

Huang and Liu do not address directly the question of the ambiguity of LDRs embedded under multiple attitudinal predicates, which is the concern in DES2, but it is relatively easy to see how the analysis could be extended to account for that phenomenon. Let us assume that the LDR in (48) can take either the closer or the higher AH as its antecedent:[20]

(48) John$_i$ says that Mary$_j$ believes that Peter hates SE$_{i/j}$.

In a movement approach, this ambiguity can be explained in terms of the distance of the covert movement: the LDR can either move to the specifier of the lower complement, with the result that it is interpreted as a *de se* property of Mary's, or to the higher one, which makes John the center. But although explanations along similar lines are quite common in the syntactic and semantic literature, it is not very elegant to have the ambiguity of the reflexive pronoun result from different structures, when there is no overt evidence for a structural ambiguity.

There is also an empirical issue for analyses of this kind, discussed for logophors in similar environments by Pearson (2015a, sect. 2.4 and 7.1), based on Charlow and Sharvit (2014, fn. 25). Consider the reading of (48) where the LDR is bound by the higher subject, John. While it may be correct that the LDR only has a *de se* reading with respect to John, it has to be read *de re* with respect to the lower AH, Mary. To account for this is not entirely trivial, since Mary presumably cannot have beliefs about John's *de se* self. This does not in itself falsify an account of LDRs along the lines of Huang and Liu (2001), but it requires an appropriate account of *de re*.[21]

[20]Here and frequently elsewhere in this dissertation, I illustrate analyses with fake English examples. In these cases, *SE* represents an LDR. The indexes only mark long-distance readings. Local readings are always ignored.

[21]Pearson (2015a) and Charlow and Sharvit (2014) argue for a structural account of this, based on the *concept generators* proposed by Percus and Sauerland (2003). Maier (2009a, sect. 5) proposes an account, framed in Discourse Representation Theory, of a somewhat similar issue involving indexicals under multiple attitude predicates.

According to DES3, a theory should give an insightful explanation of LDRs with extra-sentential antecedents. As it stands, the property abstractor account of long-distance antecedence of reflexives is restricted to intra-sentential binding, and cross-sentential binding is not explicitly discussed. We saw in subsection 2.4.1 that cross-sentential binding in Latin occurs when indirect discourse spans multiple sentences, as when a speech is reported, and comparable examples are found in languages such as Japanese, Tamil and Icelandic, cf. section 6.6. This suggests something along the lines of modal subordination, where multiple independent sentences are interpreted within the scope of an initial modal operator.[22] It is possible to imagine an approach where the reflexive pronoun moves to the left periphery of the entire sentence, turning it into a property, while the individual variable is bound off through some discourse-semantic mechanism. In other words, the property abstractor approach is not necessarily incompatible with cross-sentential binding, but it needs to be paired with a proper discourse-semantic account of indirect discourse, which to my knowledge has never been done.

More problematic is the possibility of LDRs in non-attitudinal environments, cf. DES4, as the theory draws on centred worlds, a theoretical construct proper to report semantics. Huang and Liu (2001, 180-182) discuss certain examples in Mandarin where some speakers accept LDRs in clearly non-attitudinal environments such as the following:

(49) ??*(Dang)* *Lisi piping* *ziji*$_i$ *de shihou,* *Zhangsan*$_i$ *zheng zai kan shu.*
(at) Lisi criticize REFL DE moment Zhangsan right at read book

'At the moment Lisi was criticizing him$_i$, Zhangsan$_i$ was reading.' (Mandarin; example, glosses, translation and judgement according to Huang and Liu, 2001, ex. (46))

For some speakers, (49) is apparently acceptable even if Zhangsan is unaware that he is being criticized. But Huang and Liu claim that the speaker has to empathize with, or adopt the perspective of, Zhangsan for the reading to obtain.[23] They say the following:

> The question is why an exception is allowed only when a shift in perspectives occurs that puts together the internal protagonist with the speaker. It seems to us that this shift in perspective allows the speaker to "go proxy" for the internal protagonist in viewing the relevant event or state. In this way, the internal protagonist has *virtual* consciousness given the benefit of the speaker's *actual* consciousness, and hence, had *virtual de se* attitudes about the relevant event or state. (Huang and Liu, 2001, p. 181-182)

I have difficulties understanding what they mean by *virtual de se*, but they seem to suggest that (49) involves some kind of coerced attitudinal interpretation. That might be true for Mandarin, where non-attitudinal long-distance binding is marginal and subject to inter-speaker variation. Such an explanation seems a lot less likely, however, in languages

[22] In chapter 6, I present a concrete proposal along such lines.

[23] I assume that they are right about this condition, as it is in line with the cross-linguistic literature on non-attitudinal LDRs, but it is not clear to me how an empathic and non-empathic reading can be distinguished in this case.

like Japanese, Tamil and Latin, where long-distance binding is clearly not limited to attitudinal environments.

3.4.3 Oshima (2007)

An approach which attempts to take the non-attitudinal cases of long-distance binding into account is the semantic analysis of the Japanese reflexive *zibun* by Oshima (2007). As mentioned in section 2.7, LDRs are attested in Japanese outside of indirect discourse. To account for this, Oshima proposes that *zibun* is three-way ambiguous: it has a local, syntactic use; a logophoric use in indirect discourse and an empathic use. It is this last use which is his primary concern.

Oshima suggests that the AH-oriented LDRs in indirect discourse should be analyzed in the same way as Schlenker (2003) analyzes logophors. In Schlenker's framework, attitude verbs are quantifiers over utterance contexts, cf. subsection 3.4.1, and logophors are pronouns picking up the agent of such a reported context. Oshima does not spell out the details of this proposal for Japanese LDRs. However, the predictions of such an analysis should for the most part be similar to the property abstraction analysis in the previous section.

For long-distance bound *zibun* in non-attitudinal environments, Oshima claims that the notion of *empathy* is relevant, following Kuno and Kaburaki (1977) and Kuno (1987) closely, and he draws up a formal semantic account of an empathy-based proposal. Before discussing his account, it is useful to have a closer look at the kind of data he analyzes.

We saw in section 2.7 that the verb pair *yaru* and *kureru*, both meaning 'give', differ in their perspectival behavior. To recapitulate: with *yaru*, the point of view is that of the speaker or the subject, while *kureru* shifts the perspective the dative argument. The minimal pair in (50) (=(33)) shows that a dative LDR is only allowed with *kureru*:

(50)

a. *Taroo$_i$-wa [Hanako-ga zibun$_i$-ni kasite* kureta*] okane-o tukatte*
Taroo-TOP Hanako-NOM REFL-DAT lending gave money-ACC spending
simatta.
ended.up

'Taroo$_i$ has spent all the money [that Hanako had lent him$_i$].'

b. **Taroo$_i$-wa [Hanako-ga zibun$_i$-ni kasite* yatta*] okane-o tukatte*
Taroo-TOP Hanako-NOM REFL-DAT lending gave money-ACC spending
simatta.
ended.up

'Taroo$_i$ has spent all the money [that Hanako had lent him$_i$].' (Japanese; examples, glosses, judgements and translation according to Kuno and Kaburaki, 1977, ex. (30) a and b)

There is an additional condition on the long-distance use of *zibun* with local perspective shifters, as in (50), which I did not mention in section 2.7: it must be anteceded

by a subject or a thematically prominent argument in the superordinate clause (Oshima, 2007, fn. 12 and ex. (35); Oshima, 2004). In other words, *zibun* is restricted to subordinate clauses and must take an antecedent in the superordinate clause with a particular (syntactic or semantic) function.

Oshima and Kuno draw on the notion of *empathy* to account for the perspective sensitivity in examples like (50). To give an intuitive grasp of the notion of empathy, Kuno uses the metaphor of the filming of a scene. When filming an interaction between individuals, different camera angles can be chosen: a neutral one, at equal distance from all the actors, can be selected, or one in which the scene is viewed from the angle of a particular actor. Similarly, Kuno argues, speakers unconsciously adopt different camera angles when speaking of an event. They can see it from the outside, or adopt the viewpoint of one of the participants in the event to a greater or lesser degree. He calls this adoption of viewpoint *empathy* and shows how it is relevant for a number of language phenomena, including reflexive binding.

In Kuno's account, empathy is not absolute; a speaker can empathize with discourse participants to various degrees:

(51) *Degree of Empathy:* The degree of the speaker's empathy with x, $E(x)$, ranges from 0 to 1, with $E(x) = 1$ signifying his total identification with x, and $E(x) = 0$ signifying a total lack of identification. (Kuno, 1987, p. 206)

Since empathy is graded, hierarchies of empathy between discourse participants can be established. Empathy relationships are governed by a certain number of principles, like the following two:

(52)

a. *Descriptor Empathy Hierarchy:* Given descriptor x (e.g., *John*) and another descriptor $f(x)$ that is dependent upon x (e.g., *John's brother*), the speaker's empathy with x is greater than with $f(x)$.
$E(x) > E(f(x))$
E.g. E(john) $>$ E(John's brother)

b. *Surface Structure Empathy Hierarchy ...*: It is easier for the speaker to empathize with the referent of the subject than with the referent of other NPs in the sentence.
E(subject) $>$ E(other NPs) (Kuno, 1987, p. 207; 211)

Conflicting empathy relationships are not allowed, which explains the grammaticality judgement in (53):

(53) ??Then John's brother was hit by him. (Kuno, 1987, p. 207)

The subject should receive a higher degree of empathy than the agent, due to the Surface Structure Empathy Hierarchy. However, the Descriptor Empathy Hierarchy requires the opposite empathic relationship: *John* should be ranked above *John's brother* in (53).

Zibun is sensitive to empathy: the speaker must empathize with the antecedent. When verbs are used which induce particular empathic orderings, such as *yaru* and *kureru*, *zibun* must pick up the highest ranked argument. This explains contrasts such as the one in (50). Since *kureru* is used in (50a), the dative argument receives primary empathy in the relative clause. This is consistent with the empathy requirement of the reflexive. In (50b), *yaru* is used, and there is therefore a conflict in the empathic relationships induced by the verb and by the reflexive. As a consequence, the sentence becomes ungrammatical.

Oshima attempts to formalize Kuno's account semantically. He suggests in particular that empathy is a partial ordered set of individuals ER (*Empathy Relation*), which is part of the Kaplanian context:

(54) A context of utterance = $\langle agent, (addressee), time, ..., ER\rangle$, where $agent, addressee \in U$ (the set of individuals), $time \in T$ (the set of times) ..., and ER is a poset: $\langle U, \geq_{emp}\rangle$ (Oshima, 2007, ex. (32))

The empathic reflexive has the logical form $x_1\{+persp(x_1)\}$: it is a variable associated with the presupposition $+persp$. This presupposition restricts the assignment of the variable to a high-ranked individual of the ER of the relevant context. The assignment cannot be to the highest ranked individual, however; this would lead to obligatory speaker reference, since, according to Kuno's and Oshima's assumptions, the individual with the highest degree of empathy is always the speaker, and it is not possible for a speaker to empathize more with someone else than with herself. Instead, the presupposition of $x_1\{+persp(x_1)\}$ is formulated as a restriction on the syntax/semantics interface: x_1 must be assigned to the *local empathy locus*, which is the highest ranked coargument of x_1: A dative *zibun* is allowed refer to the matrix subject when *kureru* is used, as in (50a) because *kureru* promotes its dative argument as an empathy locus. When *yatta* is used, as in (50b), a dative *zibun* cannot pick up the matrix subject, because *yatta* requires the default empathy ordering according to which the local subject outranks other arguments, cf. (52b).

It is important to note that something more is needed to account for the behavior of *zibun* in such examples: *zibun* cannot take a discourse antecedent in these contexts, but must refer to a prominent argument in the superordinate clause, as explained above. Oshima therefore suggests that the LDR is syntactically coindexed with its antecedent. He does not formalize how this coindexation comes about, however. Given that *zibun* must be syntactically bound, the empathy restriction is not in itself responsible for picking out the antecedent. Instead, it sanctions structures where *zibun* is not coindexed with a local empathy locus.

Oshima (2007) specifically addresses the issue I bring up in DES4: he offers an account of LDRs which covers both attitudinal and non-attitudinal cases. Attitudinal LDRs are in his view logophors, and non-attitudinal LDRs are empathy-sensitive. Empathy might be a reasonable way to account for the perspective sensitivity of non-attitudinal long-distance binding. I do object, however, to the claim that the reflexive pronoun is three-way ambiguous. It is already puzzling that reflexive pronouns are ambiguous between a local and a long-distance use in a number of languages. I find it hard to believe that the reflexive is three-way ambiguous, not only in Japanese, but presumably also in languages

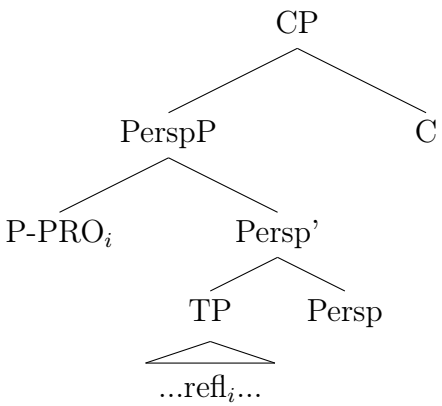
with a similar non-attitudinal use of the reflexive. This is particularly problematic as the proposed analyses for logophoric and empathic reflexives bear little resemblance to one another. In my view, we should strive for a uniform analysis of LDRs, and relegate the difference between attitudinal and non-attitudinal cases to the account of perspective shift. There are admittedly empirical challenges with the Japanese data. In particular, I find the restriction to subordinate clauses puzzling in cases where the perspective shifter is the local verb, such as with *kureru*. Still, claiming that LDRs in such examples are entirely different from LDRs in indirect discourse leaves more questions than answers in my opinion.

3.4.4 Sundaresan (2012)

A proposal which offers a unified story of attitudinal and non-attitudinal perspective is the analysis of LDRs in Tamil by Sundaresan (2012).[24] Sundaresan argues for a hybrid syntactic-semantic account, in which perspective and long-distance binding is modelled by means of a covert, syntactically represented perspectival pronoun. Very similar analyses have been proposed by Charnavel (2016) and Nishigauchi (2014) for French and Japanese LDRs respectively. Here, I will focus mainly on Sundaresan's work, but most points in the discussion are also relevant for the two other studies.

In Tamil, LDRs with AH reference occur in complements of attitude predicates. They are also found in root clauses with an indirect discourse semantics, where they take discourse antecedents. In addition, LDRs are found in certain non-attitudinal adjunct clauses, which Sundaresan argues are characterized by perspective shift (Sundaresan, 2012, sect. 4.2.2). Tamil LDRs show a sensitivity to semantic/pragmatic factors and syntactic factors in Sundaresan's view: The possibility of discourse antecedents and non-subject antecedents militates for a conceptual treatment, but certain agreement facts suggest in her opinion a structural account (Sundaresan, 2012, chap. 3). To account for this dual behavior, she proposes that clauses characterized by perspective shift contain a silent perspecival pronoun in the specifier position of a dedicated perspectival phrase. The LDR is structurally bound by this silent perspectival pronoun. (55) illustrates this:

(55)



(cf. Sundaresan, 2012, ex. (89))

[24]This account also covers local reflexives, which in Tamil show sensitivity to perspective.

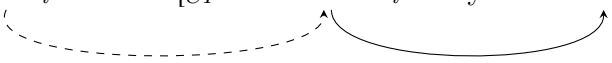
A phrasal projection *PerspP* occurs in the left periphery of the clause, with the silent pronoun, which I will call *P-PRO*, in its specifier. This pronoun binds the reflexive contained within the TP, as indicated by the indices.

While the reflexive itself is structurally bound in its local domain by the perspectival pronoun, P-PRO takes a discourse antecedent.[25] The antecedent must be suitable: It must be consistent with the phi-features of the perspectival pronoun, and it must be appropriate as a perspective holder. If, for example, the CP containing the LDR is an attitudinal complement, the antecedent of *P-PRO* must be an AH. It is not specified precisely how such antecedence restrictions come about.

I will illustrate how this works with some examples. For simplicity, I use fake English examples instead of Tamil. (56) shows an LDR in an attitudinal complement:

(56) a. John$_i$ believes that Mary loves SE_i.

b. John$_i$ believes [$_{CP}$that *P-PRO*$_i$ Mary loves SE_i]



P-PRO binds the LDR syntactically, which in the example above is marked by a normal arrow; *P-PRO* itself gets its reference through discourse binding, marked by a dashed arrow. LDRs in perspectival adjunct clauses get their reference in the same way as in (56), the only difference being that the perspectival attitudinal complement is selected by attitude predicate, while an adjunct clause is perspectival due to properties within the clause itself.

LDRs with cross-sentential antecedents play an important role in Sundaresan's argumentation, as they show that something beyond sentence grammar is needed to account for LDR antecedence. Inter-sentential binding in Tamil, as in Latin, occurs in stretches of indirect discourse which are not syntactically embedded under a speech predicate (Sundaresan, 2012, sect. 2.3.2.3 and 3.1.2). There is no need for a special treatment of LDRs in such environments: *P-PRO* binds the reflexive locally, as above, and *P-PRO* itself is resolved to a suitable antecedent in the discourse.

How does this theory answer to the desideratum in DES1? That is, how does it account for the AH-reference in indirect discourse? In order to evaluate that, we need to look a bit more closely at the assumed interaction between perspective shift and the attitudinal semantics. I will first explain how Sundaresan conceives of this interaction and show that her approach is untenable from a semantic point of view. After that I will discuss whether the theory can be saved with slightly different assumptions.

For Sundaresan, the perspectival pronoun is the origin of the attitudinal semantics, not the attitude predicate. She explains this in the following quote (the *perspectival center* is equivalent to the perspectival pronoun):

> Taken together, the patterns involving long-distance binding into CP, PP, and DP adjuncts reinforce our observation that the antecedent of *ta(a)n* [

[25] Sundaresan (2012, sect. 4.3.2) argues that the perspectival pronoun has the referential properties of non-obligatory control *PRO*. As far as I can tell from her argumentation, this is more or less equivalent to saying that *P-PRO* is an anaphor in the discourse-semantic sense.

> i.e. the Tamil reflexive] is the nominal entity that has a mental, spatial or temporal perspective toward the phrase in which the anaphor is contained. I will now attempt to capture these intuitions in more precise terms. Fillmore (1997) proposes that every sentence has a deictic center which is a reference point with respect to which deictic expressions are to be interpreted. The deictic center includes, among other things, the present time, location, and thematic information pertaining to the speaker; a similar notion is that of Kaplan (1989)'s context which is envisioned as a tuple containing coordinates pertaining to the *Speaker, Addressee, Time*, and *World* of the actual context of utterance.
>
> Extending these insights, I introduce the notion of a "perspectival center" which contains information pertaining to the time, world, location, and mental attitude of the anaphoric antecedent. The perspectival center can also be seen as being on a par with Lewis (1979)'s enriched intensional index which is supposed to contain information pertaining to the time, world, and location of an attitude-holder. Sundaresan (2012, p. 69-70)

The perspectival pronoun introduces into the semantic structure the contextual coordinates of its antecedent, and the clause containing *P-PRO* is interpreted relative to those coordinates. The AH-relative semantics of indirect discourse is, in other words, not due to (e.g.) properties of the attitudinal predicate, but to *P-PRO*. Sundaresan does not formalize this idea and does not, as far as I can see, discuss its semantic implications in detail.

Taken at face value, this idea does indeed make sense of the AH-reference in indirect discourse, as required by DES1. After all, the LDR is bound by a pronoun representing the AH. However this approach makes semantic predictions which are clearly unwanted in cases of multiple embedding of attitude predicates (DES2). Let us consider the sentence in (57a) where an LDR occurs within an attitudinal complement embedded under two attitude verbs.

(57)

a. John$_i$ says that Peter$_j$ believes that Mary loves $SE_{i/j}$.

b. John$_i$ says [that Peter$_j$ believes [that *P-PRO*$_i$ Mary loves SE_i]].

c. John$_i$ says [that Peter$_j$ believes [that *P-PRO*$_j$ Mary loves SE_j]].

According to Sundaresan (2012, sect. 5.5), the ambiguity of the LDR results from the referential possibilities of the covert perspectival pronoun. (57b) represents the reading of (57a) where the LDR is anteceded by the higher subject, and (57c) the reading where the LDR is bound by the lower subject. As is evident from the arrows, the structural binding relationship between *P-PRO* and the LDR is local in both cases. The difference

in reading is due to the non-structural coreference relationship between *P-PRO* and the actual antecedent, marked in (57b) and (57c) by dashed arrows.

When paired with the aforementioned assumptions about attitudinal semantics, this analysis of the ambiguity leads to incorrect predictions: on the reading where the LDR is anteceded by John, the higher subject, the *P-PRO* of the clause containing the LDR is also assigned to John, as (57b) shows. If *P-PRO* is responsible for the attitudinal semantics, the lower attitudinal complement must be interpreted relative to John, the subject of the higher speech predicate, not Peter, the subject of the belief predicate immediately embedding it. In other words, John becomes the AH of Peter's belief report, which is nonsensical.

It is possible to imagine a version of the theory where indirect discourse gets its attitudinal interpretation in a more conventional way, e.g. by means of the attitude predicate, and that the only task of *P-PRO* is to provide an antecedent for perspectival expressions. Such an account is not explicitly argued for anywhere to my knowledge, but seems at least compatible with the analyses of Nishigauchi (2014) and Charnavel (2016), who are less explicit about the semantics. An analysis along such lines might work formally, but it appears to me to be an *ad hoc* solution which serves no other purpose than preserving local binding of the LDR.

Despite the semantic difficulties with Sundaresan's theory, there are two aspects of it which I find promising. The first is her treatment of cross-sentential LDRs (DES3). Since perspective shift relies on discourse semantics, cross-sentential LDRs can be treated on par with intra-sentential LDRs. The second promising aspect is that she draws on the same machinery to analyze attitudinal and non-attitudinal perspective (DES4), unlike the previous theories we have seen.

3.4.5 Sells (1987)

Another attempt at a unified account of LDRs in attitudinal and non-attitudinal environments is the classic analysis of Sells (1987). Although Sells focuses mostly on LDRs in Japanese and Icelandic, the analysis is also intended to capture dedicated logophoric pronouns in languages such as Ewe.

LDRs and logophors differ in distribution between languages: logophors are often restricted to speech reports, and as we have seen, LDRs in languages such as Icelandic and Mandarin exclusively occur in indirect speech/thought, while Japanese LDRs have a more general perspectival use. Sells attempts to capture this distributional difference by means of three *discourse roles*: *Source*, *Self* and *Pivot*. The *Source* is the communicative agent of a piece of discourse, the *Self* is the individual whose thought content or *mind* the discourse expresses, and the *Pivot* is the individual whose spatio-temporal location deictic expressions are evaluated from.

By default, all three roles are assigned to the external speaker. However, they can be shifted to a discourse-internal individual in certain linguistic environments, in particular in indirect discourse. Sells argues furthermore that the shifting of the discourse roles is subject to an implicational hierarchy: If the *Source* is internal, as in indirect speech, so is the *Self*, since speech implies conciousness on behalf of the speaker. The *Pivot*

must also be internal, since adopting someone's mind presumably implies adopting their physical point of view. However, the *Self* and the *Pivot* can be internal and the source left external, as in indirect thought. The *Pivot* can also be shifted individually, which is how Sells accounts for non-attitudinal perspective.

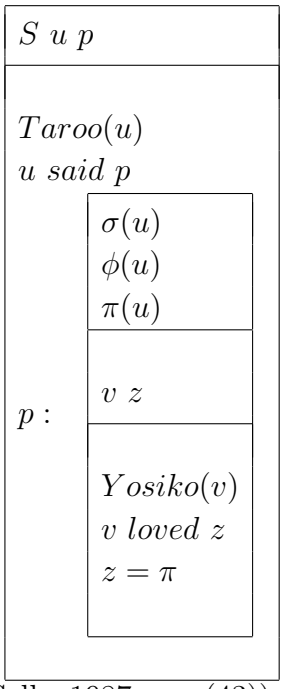
Logophors and LDRs are treated as anaphors which must be resolved to internal discourse roles. Sells frames his analyses in a somewhat augmented version of Discourse Representation Theory (DRT; Kamp, 1981).[26] However, his Discourse Representation Structures (DRSs) are not interpreted, and therefore do not fulfil the requirements for a proper formal semantic theory.

(58) illustrates how the analysis works for Japanese, where LDRs pick up an internal *Pivot*. (58a) is the translation of a Japanese sentence with an LDR in indirect speech. (58b) is the DRS Sells proposes for this sentence. σ represents the *Source*, ϕ the *Self* and π the *Pivot*.

(58)

a. Taroo$_i$ said that Yosiko loved SE_i.

b.



(Sells, 1987, ex. (43))

S in the matrix universe represents the speaker, u the matrix subject, and p the complement proposition. It is part of the lexical specification of *say* that it shifts all the discourse roles to its subject in the DRS of the clausal complement. This is represented in a dedicated field of the complement's DRS, above its universe. The LDR, the discourse referent z, is a role-oriented anaphor, which in Japanese must be resolved to an internal *Pivot*. This resolution is represented as $z = \pi$.[27]

[26] In this section I will assume a basic understanding of DRT. For a proper introduction to the framework, see the following chapter.

[27] In the field above the universe, the discourse roles appear to be functions, while they are constants when occurring in conditions such as $z = \pi$. Since the DRSs are uninterpreted, it is not clear to me how we should make sense of this difference.

In complements to thought predicates, the *Source* is assigned to the external speaker, while the *Self* and the *Pivot* remain internal. Finally, in non-attitudinal shifting environments, only the *Pivot* is assigned to a discourse-internal participant.

Languages differ with respect to which role the LDR picks up. Japanese-style LDRs pick up an internal *Pivot*, and can therefore be used in all shifting environments. Icelandic-style LDRs pick up an internal *Self*, and are therefore restricted to indirect speech and thought. Logophors restricted to speech reports only pick up an internal *Source*. Because of the implicational hierarchy of roles, it is predicted that only these three classes of languages are found.

Sells attempts to account for the AH-reference of LDRs and logophors, cf. DES1, through his use of discourse roles: in indirect speech and thought, the antecedent is the discourse role representing the indirect speaker or thinker. It is hard to evaluate this aspect of the approach, however. The DRSs are uninterpreted, and it is consequently not possible to work out the truth conditions. Also, the discourse roles are not connected to attitudinal semantics in any obvious way. It seems, for example, far from obvious to me that indirect speech implies indirect thought, as the implicational relationship between *Source* and *Self* suggests: the truth conditions of a sentence like *John says that it is raining* do not seem to be affected by whether or not John believes that it is raining or has any other specific mental attitude towards the complement proposition.

One aspect which I do find interesting and fruitful in Sells' approach is his appeal to spatial perspective in the analysis of Japanese LDRs. According to Sells, perspectival expressions are shiftable in attitudinal environments, because representing someone's speech or though implies in some sense adopting that person's spatial perspective. This is in line with neuro-linguistic research, which suggests that the representation of someone's thought involves representing the world from that person's physical point of view, which is referred to as *mentalizing* (see, e.g., Frith and Frith, 2006, for an overview of the literature). I will return to this point in subsection 5.3.5. Spatial interpretation is not inherently linked to attitudinal semantics. It is conceivable that a shift of spatial point of view also takes place in certain other environments, affecting LDR antecedence. Spatial perspective might therefore be a promising way of trying to unify attitudinal and non-attitudinal LDRs, cf. DES4. Due to the non-interpreted status of Sells' DRSs, it is difficult to work out the precise predictions of such an account.[28]

Sells (1987) does not specifically address the issues in DES2 and DES3, the ambiguity of LDRs in deeply embedded indirect discourse and LDRs with extra-sentential antecedents. However, it seems to me that his account nevertheless is well-equipped to handle those issues. The ambiguity of LDRs under multiple attitude predicates seems to follow quite straightforwardly from the account: perspective shift is modelled by marking certain discourse referents with specific roles. The LDR is an anaphor, i.e., a pronoun which must be resolved to some accessible antecedent in the textual context, and the

[28]Iida (1996) proposes a more formalized account of reflexives in Japanese, based on spatial perspective-shift. That analysis cannot be generalized to a language like Latin, however, as a perspectival analysis of local reflexives is a crucial component of it. As explained in section 2.6, local reflexives in Latin are not sensitive to perspective.

antecedent has to be associated with a particular discourse role.[29] When one attitude predicate is embedded under another, there will be multiple accessible antecedents to the anaphor with the relevant marking, and it can therefore be resolved to any of them. Using anaphora instead of structural binding to model the ambiguity has an interesting advantage: it is not necessary to posit different structures for the different antecedence options. This is a welcome consequence, as there is, to my knowledge, no independent evidence that the ambiguity is in fact structural. But again, the potential success of the anaphoric approach depends on the interpretation of the DRS representations. In particular, we need to ensure that the perspective is shifted only within the scope of the embedded DRS representing the indirect discourse. In Sells' DRSs, the roles are assigned in a field above the universe of the embedded DRS. As long as it is uncertain what role this field plays in interpretation, it is impossible to determine whether the perspective shift only takes scope within the embedded DRS as intended.

LDRs with extra-sentential antecedents occur in indirect discourse spanning over multiple sentences. To properly account for indirect discourse of this kind, it is necessary to employ a semantic framework which is not restricted to the sentence, but can handle semantic discourse dependencies. DRT is a framework with this property, and it therefore seems like a well-suited framework for a comprehensive account of long-distance binding.

It should be noted that Stirling (1993, chap. 6) criticizes Sells' account along similar lines as I do, and proposes an alternative DRT-based theory of long-distance binding and logophoricity. She argues for the relevance of a *validator*, who is "the individual to whom the speaker linguistically assigns responsibility for the discourse in question" (Stirling, 1993, p. 282). The external speaker is by default the validator, but this role can also be shifted to a discourse-internal participant. Predicates which trigger long-distance binding lexically shift the validator to their subject. LDRs and logophors are anaphors restricted to non-speaker validators. It is unclear what predictions this account makes, as Stirling does not specify how the validator role interacts with attitudinal semantics. When discussing the indicative/subjunctive distinction in Icelandic, Stirling appears to imply that the validator of complements of factive attitudinal verbs, e.g., *know*, is the external speaker (Stirling, 1993, p. 291), which suggests that not all AHs are internal validators. If LDRs pick up internal validators, not AHs, it is surprising that LDRs occur in complements to factive attitude predicates in Latin and other languages. Stirling also uses the validator to account for LDRs in non-attitudinal environments in Japanese (Stirling, 1993, p. 301-303), but it is far from clear to me how that can be done without coercing a report-like semantics on those environments, given the definition of the validator.

To me there seem to be strong reasons for choosing a dynamic semantic framework, due to the possibility of LDRs with cross-sentential antecedents. Analyzing LDRs as anaphors is also an interesting choice, as the ambiguity of LDRs in deeply embedded indirect discourse can be accounted for without positing covert structural ambiguity. The dynamic account must include an explicit semantics for indirect discourse. While Stirling is more explicit than Sells about the interpretation of the DRSs, the validator approach seems to me to raise more questions than it answers.

[29] See chapter 4 for more on anaphora and anaphoric accessibility.

3.4.6 Latin-specific accounts

No full-fledged formal semantic accounts of Latin LDRs have been proposed prior to the present work. In this section I will briefly comment on previous accounts of the Latin data which elaborate on the connection between LDRs, attitudinal semantics and perspective. For a comprehensive critical review of the previous linguistic literature on Latin LDRs, see Jøhndal (2012, sect. 4.2).

Bertocchi (1989) suggests that the antecedent pattern of LDRs in Latin can be explained in terms of empathy, drawing on Kuno and Kaburaki (1977). A more elaborate perspectival account is developed by Bertocchi (1994), who investigates the relative distribution of the third person personal pronoun *is* and long-distance uses of *se*. Unfortunately, the account argues for the relevance of some poorly defined semantic distinctions, which makes it difficult to evaluate it properly. Bertocchi categorizes subordinate clauses as belonging to different *levels*. The *predicational level* contains clauses "designating states of affairs" (Bertocchi, 1994, p. 4), and includes complements to utterance and mental state predicates, but apparently also comparative clauses, temporal clauses and purpose clauses, judging from the examples she gives. To the *propositional level* belong clauses expressing "some specification by the speaker of the degree to which he feels committed to the truth of the content he transmits" (Bertocchi, 1994, p. 16). This level appears to include causal clauses and relative clauses. LDRs are used instead of *is* on both levels. First, on the predicational level, LDRs are used in *imperative* clauses, or subordinate clauses expressing the purpose of the main subject. These include subjunctive complement clauses to manipulative utterance predicates, such as *ask* and *permit*. *Is*, on the other hand, is used in predicational clauses which Bertocchi classifies as *declarative*, e.g., temporal adjunct clauses. Second, LDRs are also used in clauses on the propositional level, provided that they express the commitment of the main subject to the truth of their content, which covers the non-attitudinal cases of long-distance binding. *Is* is used in clauses of this type when the speaker takes responsibility for the content.

The suggestion that non-attitudinal LDRs are related to the subject's commitment is interesting, and I will return to that part of Bertocchi's account in subsection 5.8.2. However, the relevance of the the two levels is difficult to make sense of, as LDRs are found in both predicational and propositional clauses. The distinction made within the predicational level does not seem to get the distribution right either: among the clauses Bertocchi classifies as predicational, LDRs are not restricted to the ones with a purpose interpretation, but also occur in complements to declarative utterance verbs, belief verbs and the like. Bertocchi specifically mentions this, and connects it to the fact that AcIs, not subjunctive clauses, are usually used in complements to such verbs (Bertocchi, 1994, p. 14-15). The AcI construction, she claims, "neutralizes the alternation between *se* and *is*" (Bertocchi, 1994, p. 15). It is unclear to me what that means or how it explains the occurrence of LDRs in AcIs.

In my previous writing (Solberg, 2011) I drew on Sells (1987) to account for the Latin data. I argued that LDRs in Latin usually are oriented towards an internal *Self*, accounting for the AH-reference in indirect discourse. In addition, I tentatively suggested that *Pivot*-reference is a marginal possibility too, in order to explain the infrequent non-

attitudinal cases. Solberg (2011, chap. 5) includes a draft of a formal analysis of the *Self*-referring LDRs along the lines of Schlenker's (2003) account of logophors. An analysis along such lines can account for the AH-orientation of LDRs in indirect discourse (DES1). However, as discussed above with respect to Oshima (2007), it is problematic to postulate ambiguous reflexive pronouns to capture the non-attitudinal cases (DES4). As I noted previously (Solberg, 2011, chap. 5), LDRs in messenger reports are also puzzling on a Schlenker-style account, as LDRs in these cases appear to refer to someone other than the agent of the reported utterance context.[30] I proposed no formal account of LDRs with extra-sentential antecedents (DES3).

Jøhndal (2012, chapter 4) attempts to account for the Latin data through what he calls a *lexicalized logophoricity* account. His account is syntactic, using Lexical Functional Grammar. Speech/thought predicates are lexically designated as logophoric licensers, and specify one of their arguments as a logophoric antecedent. The complement clause of a speech/thought predicate is marked as a logophoric domain, and this domain marking is allowed to *drip* into other clauses embedded within the complement, to account for the fact that LDRs can occur in adjunct clauses within indirect discourse. The LDR itself has the restriction that it must be bound by a logophoric antecedent within a logophoric domain. In cases where there are multiple logophoric antecedents, as in deeply embedded indirect discourse, the LDR can pick any of them. Although Jøhndal's analysis is syntactic, it is not subject to the criticism of syntactic accounts in section 3.2, since antecedents are lexically specified for each predicate and not determined by a specific syntactic relation such as c-command. Jøhndal struggles with certain non-subject-oriented cases, where the antecedent does not appear to be an argument of the complement-taking predicate (Jøhndal, 2012, sect. 4.4.4). Another issue is LDRs with cross-sentential antecedents in UID. Jøhndal briefly suggests two possible solutions: either each sentence of the UID is associated with a silent speech verb, or such sentences have a matrix complementizer which is itself a logophoric licenser. A third issue is the non-attitudinal cases of LDRs. Jøhndal tentatively suggests that empathy might be relevant, but does not find conclusive support for such an explanation in the very limited Latin data.

Relegating the issue of LDR antecedence to the lexical specification of speech/thought predicates is not incompatible with LDRs being AH-referring, as required by DES1. We may assume, given such a framework, that the lexical semantics of the predicate determines which argument it assigns as a logophoric antecedent. However, the lexical theory does not in itself explain AH-reference without being coupled to some appropriate semantics. The analysis does account for the ambiguity of LDRs embedded under multiple attitude predicates (DES2) without positing covert structural ambiguities, which is a big advantage: the antecedent options of the LDR are formulated as constraints on possible antecedents, and not (e.g.) in terms of covert movement, unlike the syntactic approaches reviewed in subsection 3.4.2. As far as I can tell, the predictions with respect to DES2 are the same as in anaphoric approaches such as those of Sells (1987) and Stirling (1993).

[30]However, in chapter 7 and Solberg (2015) I present new data which suggests that the referential pattern in messenger reports is less exceptional than what I assumed in Solberg (2011). Given these findings, it would probably be possible to integrate LDRs in messenger reports in a Schlenker-style analysis, if desired.

LDRs with extra-sentential antecedents (DES3) are problematic for Jøhndal's account, however: in a recent study conducted by Dag Haug, Jøhndal and me (Haug et al., 2017), we found that there are empirical problems with using silent speech verbs in the analysis of Latin UID (see also section 6.2). The second alternative Jøhndal (2012) suggests is that the matrix complementizer could be the logophoric licenser. It is not clear to me how the correct antecedent is picked out in that case. Since the antecedent and the LDR occur in different sentences, the complementizer cannot specify a logophoric antecedent syntactically. It seems to me that the possibility of LDRs with extra-sentential antecedents strongly militates against any account which derives the LDR-antecedent relationship from syntax. Finally, Jøhndal, like Solberg (2011), needs to posit a special mechanism for LDRs in non-attitudinal environments (DES4).

In the next section, I will summarize some key points from this discussion of the previous literature and draw the outline of a new semantic account of LDRs.

3.5 The route from here: Anaphora, events and dynamic semantics

As we have seen above, none of the reviewed approaches from the existing literature adequately meet all the desiderata for a semantic theory of long-distance reflexivity outlined in section 3.3. In particular, there is a tension between the requirement that the theory should explain the AH-reference of LDRs (DES1) and the possibility of extending the analysis to non-attitudinal environments (DES4). A centred worlds analysis elegantly captures AH-reference, but leaves open why there are LDRs in environments other than indirect discourse. It is possible to follow Oshima (2007) and posit that there are two independent strategies for long-distance binding, but then we must posit a three-way ambiguity for the reflexive pronoun in languages such as Japanese and Latin. A more attractive alternative is to keep a common denotation for the LDR, and explain the attitudinal and non-attitudinal cases as different kinds of perspective shift, as e.g. Sells (1987) and Sundaresan (2012) do.

Two questions arise from this choice of direction: 1. How can perspective shift be formally modelled in a way that accounts both for AH orientation in indirect discourse, but also allows shift in perspective to happen in other environments? 2. What characterizes non-attitudinal perspective shift?

I will strive to give a satisfactory answer to Question 1. In chapter 5, I will propose a semantic approach to perspective shift in attitudinal environments using events and thematic roles, in part inspired by Deal (2014). My analysis will capture the AH orientation in indirect discourse as perspective shift to the agent of an utterance event or the experiencer of a mental state. Unlike centred worlds, events and thematic roles are by no means restricted to attitudinal environments. An event-based account of perspective shift can therefore be generalized to other environments, and chapter 5 will also address how perspective shift can be modelled with event types other than speech events and mental states.

When it comes to Question 2, the jury is still out on what factors are relevant for

non-attitudinal perspective shift. A dissertation mainly based on Latin data is not the place to properly address that issue. We know from Latin that something beyond attitudinal semantics is needed, because LDRs are also found in some non-attitudinal cases. Therefore, an account entirely based on attitudinal semantics would make false predictions. However, because of the scarcity of data and lack of native speakers, it is not possible to nail down what the specific factors are in Latin. In fact, it is not possible to establish definitely from the Latin non-attitudinal cases that perspective is the determining factor, cf. subsection 5.8.2. However, the cross-linguistic literature on long-distance binding has focused on perspective shift with promising results. In this dissertation, I will simply assume that perspective shift is the factor unifying attitudinal and non-attitudinal long-distance binding in Latin as well, and focus on how to model this shift formally.

Turning to the coreference relation between the LDR and its antecedent, we have seen in this chapter that there are some advantages to treating the LDR as an anaphor, a pronoun which needs to be resolved to an entity in the textual context. Specifically, an anaphoric analysis is able to account for the ambiguity of LDRs in deeply embedded indirect discourse, cf. DES2, without positing a covert structural ambiguity. In this dissertation, I will propose an anaphoric account of LDRs framed in a compositional version of DRT, Partial Compositional DRT (PCDRT; Haug, 2013). An introduction to DRT in general and PCDRT in particular will be given in the next chapter, before turning to the treatment of long-distance binding inside and outside of attitudinal environments in chapter 5. There is another advantage to framing the analysis in a dynamic semantic framework: it allows for a proper treatment of the cross-sentential semantic relations involved in indirect discourse spanning over multiple sentences, which is attested in Latin. A PCDRT account of such cases will be the subject of chapter 6. In chapter 7, I will show how the PCDRT account can be extended to LDRs in the so-called messenger reports.

Chapter 4

Theoretical framework

4.1 Introduction

I argued in the previous chapter that an account of LDRs should be framed within a dynamic semantic framework, that perspective shift should be accounted for in terms of events and thematic roles, and that LDRs should be analyzed as anaphors. In this chapter, I will introduce PCDRT, the dynamic semantic framework I will use in my analyses, and add the necessary machinery for a proper treatment of LDRs.

PCDRT is a compositional semantic theory, unlike most versions of DRT. In section 4.2, I state my reasons for choosing a compositional theory. Section 4.3 gives a brief introduction to classical DRT and presents some of the issues which led to the development of PCDRT. An account of the basic PCDRT framework of Haug (2013) is given in section 4.4. This framework does not include a treatment of modality. I therefore add a modal extension to PCDRT in section 4.5. Since my account of perspective shift will rely on thematic roles, I also implement a neo-Davisonian event semantics in PCDRT. This is the topic of section 4.6. Readers who are not interested in the technical details may skim the explanation of the PCDRT framework in sections 4.5-4.6. Section 4.7 summarizes some key differences between classical DRT and PCDRT which will be relevant in subsequent chapters.

4.2 Compositionality and dynamic semantics

In classical Montagovian semantics, the meaning of a sentence is its truth conditions, which are to be evaluated with respect to a model of the world. On this view, a sentence is an atomic unit, which can be interpreted in isolation from its discourse context. While a *static* approach to semantics of this kind is sufficient for many purposes, it does not offer a principled way of accounting for cross-sentential phenomena such as anaphora, presupposition and rhetorical structure.

Dynamic approaches to semantics take the meaning of a sentence to be its *information change potential* (Kamp et al., 2011, p. 125), its ability to alter the discourse in which it occurs by adding its content (see, e.g., Stalnaker 1979). In the eighties and nineties, several theories were put forward which formalized this view of meaning, such as Dynamic

Predicate Logic (Groenendijk and Stokhof, 1991), File Change Semantics (Heim, 1982) and DRT (Kamp, 1981).

In DRT, a special representation known as a *Discourse Representation Structure* (DRS) is constructed from the syntactic structure of the sentences of the discourse. Subsequent sentences incrementally update the DRS, and finally, the DRS is interpreted with respect to a model of the world. In the next section, I will return to how DRT works and what kind of facts it explains. Here, I focus briefly on the issue of compositionality.

A compositional theory of natural language semantics assumes that the meaning of a complex linguistic expression is wholly determined by the meaning of the individual constituents of the expression and by the syntax, or how the constituents are combined. In a fully compositional theory, sentence or discourse meaning is reducible to syntactic structure and lexical semantics. An important argument in favor of compositionality is the productivity of language: we can produce and adequately understand expressions which we have never heard before. It must therefore be possible to figure out the meaning of an expression solely on the basis of the atomic elements of the expression and the way these atoms combine (see, e.g., Szabó, 2013, and references therein).

Classical DRT is not compositional in this way: individual linguistic tokens do not have meanings by themselves, and syntactic structures are not directly involved in interpretation. Instead, an intermediate representation, a DRS, is constructed from the structure of the sentence, and it is the DRS which is interpreted. Proponents of classical DRT argue that strict compositionality is not needed to explain the productivity of language, as long as meanings of expressions are determined on the basis of algorithmic procedures such as DRS construction and interpretation (see, e.g., Geurts et al., 2016, sect. 6).

I have chosen to adopt a compositional version of DRT for methodological reasons rather than conceptual ones. First, and perhaps most importantly, most modern theories of LDRs and pronouns with similar behavior assume some kind of compositional (albeit static) semantics. I have argued that a dynamic semantics is called for, in particular to account for LDRs with cross-sentential antecedents. In my view, a move from a strictly compositional view of the interface between syntax and meaning to a non-compositional view should be independently motivated and not be a mere byproduct of choosing a dynamic framework over static semantics.

Secondly, by choosing a compositional theory, phenomena which are not easily treated compositionally can be pinpointed and discussed when they are encountered. In a theory which at the outset is non-compositional, such phenomena might go unnoticed. An example of this is found in the account of multi-sentence indirect discourse in chapter 6, where previous DRT accounts have drawn heavily on non-compositional presupposition accommodation. I show that by working out a proposal on a more restrictive compositional basis, it is possible to tease out additional insights into the phenomenon, because we see what can be explained solely on the basis of the meaning of words and the way they are combined, and where there might be a need for something beyond that.

A few words need to be said about my syntactic assumptions. I adopt a simplified version of Chomskian syntax (see, e.g., Adger, 2003). I assume that a clause consists of three projections: a verb phrase (VP), a tense phrase (TP) and a complementizer phrase

(CP). Accounting for the word order of Latin sentences is far from a trivial matter. In this dissertation, word order issues are ignored. When syntactic representations are given, they should be seen as abstract logical forms where projections occur in the appropriate order for interpretation.

4.3 The predecessors of PCDRT

4.3.1 Background

It is difficult to present PCDRT without saying something about its prehistory, which is directly reflected in the name of the theory: the first predecessor to PCDRT is Discourse Representation Theory (DRT; Kamp, 1981; Kamp et al., 2011), an early and very influential dynamic semantic framework. The second predecessor is Compositional DRT (CDRT; Muskens, 1996), which is a compositional reinterpretation of DRT. Most of the advantages of DRT are preserved in CDRT. An important exception, however, is anaphora resolution, which is treated syntactically rather than semantically in CDRT. PCDRT integrates a semantic treatment of anaphora in a compositional framework, and also improves some technical details of CDRT. This framework fulfils my need for a theory which is both dynamic and compositional, and makes it possible to account for anaphora resolution, elements which will be particularly relevant when analyzing LDRs in Latin.

4.3.2 An informal sketch of DRT

The sketch of classical DRT given in this section serves as a background for the more detailed presentation of the formalism I argue for in section 4.4. For an extensive treatment, I refer the reader to Kamp et al. (2011), which I draw heavily on in the following.

In classical DRT, semantic representations, DRSs, are constructed from sentences and sequences of sentences. These representations have a model-theoretic interpretation. In other words, sentences are not interpreted directly, but only through the intermediary of a representational level. In what follows, I first present the representational level and then turn to the interpretation.

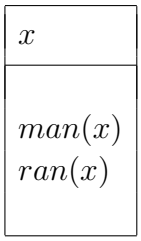
A DRS is a pair $\langle U, Con \rangle$. U, the *universe* of the DRS, is a set of *discourse referents*, i.e., variables for the individuals (or events, time intervals etc.) of the discourse. Con is a set of conditions which apply to the discourse referents in U.

Let us suppose that sentence (59) is the first sentence of a discourse.

(59) A man ran.

A construction algorithm constructs the DRS in (60) on the basis of the syntactic structure of (59). The DRS can either be written in the *box* notation in (60a) or in the linear notation in (60b). The two notations will be used interchangeably in this dissertation.

(60) a.



b. [x| man(x), ran(x)]

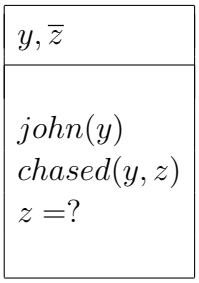
The field above the line in the box notation, or before the pipe in the linear notation, lists the discourse referents in U; the second field lists the conditions in Con. In most cases, when the construction algorithm encounters a DP, as in (59), it adds a discourse referent to the universe and appropriate conditions applying to that discourse referent. We will see below how this gives us the semantics of existential quantification in examples like (59).

Let us assume that the small discourse in (59) continues as follows:

(61) John chased him.

The DRS of this sentence is given in (62):

(62)



When a name, e.g., *John*, is processed by the construction algorithm, a discourse referent, y, is added to U, and a one-argument condition is added to Con, *john(y)*, which means something like *y is named John*. A discourse referent z is added for the pronoun *him*. *Him* is *an anaphor*, an expression which needs to be resolved to an antecedent in the textual context. The bar over the discourse referent in the universe marks the discourse referent as anaphoric. Being an anaphor, it needs to be equated to a discourse referent in the previous discourse, and is therefore associated with an equality condition. Since this sentence is not yet merged with a previous discourse, however, there is a question mark on the right hand side of the equality condition.

The DRSs in (60) and (62) can now be sequenced. The sequencing operator *;* takes two DRSs K_1 and K_2 as input and returns a DRS K_3, which is the union of the universes of K_1 and K_2 and the conditions of K_1 and K_2 (cf., e.g., the presentation of classical DRT in Muskens, 1996, p. 149-152). The DRS of the previous discourse, (60) in this case, is called the *context DRS*, and the DRS of the new sentence is dubbed the *assertoric DRS*. *Him* needs to be resolved to an antecedent. In classical DRT, this is done by equating the discourse referent of the anaphor with another discourse referent in the universe. In our example, *him* is resolved to *a man*, and we therefore get the equation $z = x$, as is shown in (63). For anaphora resolution to take place, there must be a suitable antecedent in the

preceding context. If there is none, the derivation should abort. Anaphora resolution must take place before new sentences are merged in, which explains why anaphors generally pick antecedents in the preceding context, rather than in the subsequent discourse (cf. Kamp et al., 2011, p. 131-132 and 140-142).[31]

(63)

x
$man(x)$ $ran(x)$

;

$y, \overline{z}$
$john(y)$ $chased(y, z)$ $z =?$

=

$x, y, \overline{z}$
$man(x)$ $ran(x)$ $john(y)$ $chased(y, z)$ $z = x$

Note that anaphora resolution does not rely on any kind of indexing in the input structure, but is performed in the semantic structure. This process is not deterministic, but is supported by, e.g., world knowledge and pragmatic inferences. But the semantic structure does constraint the accessibility of antecedents, as we will see below.

Subordination, scope and accessibility

A semantic framework needs a way to account for scope. In DRT, this is done by DRS subordination. Subordination is used to restrict the accessibility of anaphors. It is useful to look at some different kinds of subordination which occur in DRT, and what effects scope relations and accessibility constraints induce. It is important to note, however, that the scope and accessibility facts follow strictly from the interpretation of the DRS, which will be given in (74) below.

Universal quantification is often treated in DRT on par with conditionals.[32] Conditionals are formalized as structures such as (64) in DRT:

(64)

DRS 1 DRS 2 $\Rightarrow$ DRS 3

[31] van der Sandt (1992) argues for an alternative DRT account of anaphora resolution, which treats anaphora and presupposition resolution with the same mechanism. I will return to this account in subsection 6.3.1.

[32] It is also possible, however, to formalize universal quantification with so-called *duplex conditions*, cf. Kamp et al. (2011, p. 166-173).

DRS 1 is the matrix DRS, DRS 2 is the DRS for the conditional antecedent, and DRS 3 is the consequent. This structure contains two subordination relations: First, DRS 2 is subordinated to DRS 1; second, DRS 3 is subordinated to DRS 2. Discourse referents in conditions can be picked up from the universe of the DRS immediately containing the condition or from the universe of a superordinate DRS, but not from the universe of a subordinate DRS, and these restrictions give us the scope of quantifiers. Example (65) illustrates this:

(65) Every student has read a paper.

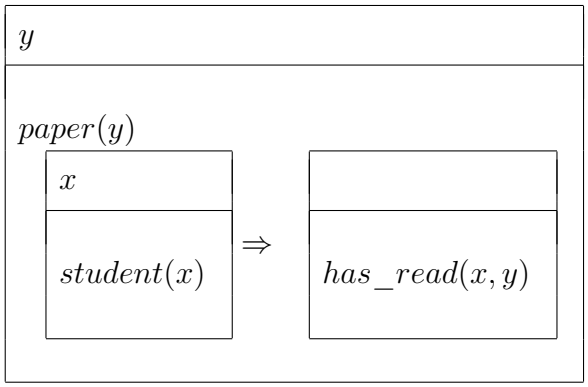
This example has the two readings: either there is a paper which every student has read or every student has read a paper, but not necessarily the same paper. The two readings correspond to the following two formulae of predicate logic:

(66) a. $\exists y(paper(y) \wedge \forall x(student(x) \rightarrow has\_read(x, y))$

b. $\forall x(student(x) \rightarrow \exists y(paper(y) \wedge has\_read(x, y))$

Reading (66a), where the existential quantifier scopes over the universal, corresponds to the DRS in (67):

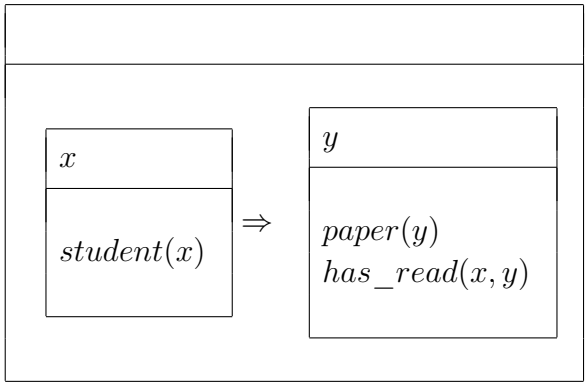
(67)



The discourse referent and condition contributed by *a paper* are introduced in the topmost DRS and picked up in the consequent. Since the topmost DRS is superordinate to the condition which contains the discourse referent for *every student*, we get the wide scope reading of the existential quantifier.

The reading in (66b), where the universal quantifier takes scope over the existential quantifier, results in the following DRS, where y is introduced in the consequent:

(68)



An interesting feature of DRT is that subordination is also used for restricting accessible referents for anaphors: As we saw above, referents get an antecedent by equating the discourse referent of the anaphor with that of an antecedent. An anaphor can only look for antecedents, however, in the universe of the DRS immediately containing it or in the universe of a superordinate DRS, not in the universe of a subordinate DRS. Let us suppose that the discourse in (65) continues as in (69a), which results in the DRS in (69b):

(69)

a. It is written by Chomsky.

b.

$\overline{z}, w$
$chomsky(w)$ $written\_by(z, w)$ $z =?$

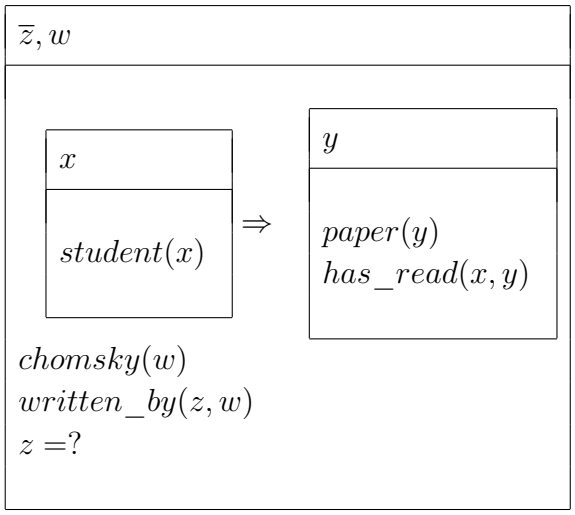
When we merge this sentence with the preceding discourse in (65), we need to find a suitable antecedent for *it*. On the wide scope reading of the existential quantifier, this can be done by equating z with y, which is accessible in the universe of the matrix DRS:

(70)

$y, \overline{z}, w$
$paper(y)$ $\begin{array}{\|l\|} \hline x \\ \hline student(x) \\ \hline \end{array} \Rightarrow \begin{array}{\|l\|} \hline \\ \hline has\_read(x, y) \\ \hline \end{array}$ $chomsky(w)$ $written\_by(z, w)$ $z = y$

However, on the narrow scope reading of the existential quantifier, there is no accessible discourse referent for the anaphor, because y is introduced in a DRS subordinate to the DRS containing the anaphor:

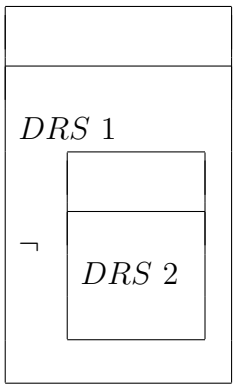
(71)



In this scenario, there is no unique known paper to which the anaphor can refer, but rather potentially different papers for different students.

Another area where scope is relevant is negation. Negation results in DRSs of the following kind:

(72)

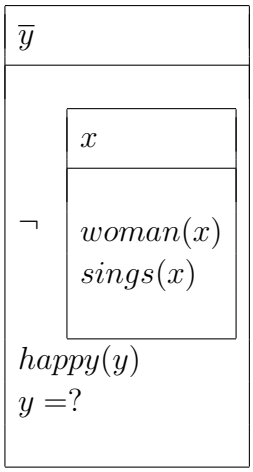


DRS 2 in (72) is subordinated to DRS 1, and discourse referents in the universe of DRS2 are therefore inaccessible in DRS 1, while discourse referents in DRS 1 are accessible in DRS 2. This correctly predicts that discourses such as (73a) should be impossible, cf. (73b):

(73)

a. *No$_i$ woman sings. She$_i$ is happy.

b.



Interpretation

Ordinary first-order models are used to interpret the structures in classical DRT.[33] A model M is a pair $\langle D, I\rangle$ of a domain of individuals D and an interpretation function I. For all n-ary predicates R, $I(R) \subseteq D^n$. Discourse referents are taken as variables. Assignments, or in DRT terminology, embeddings, are functions from discourse referents to individuals in D.[34] The embeddings are partial functions, assigning individuals only to discourse referents which are previously used in the discourse.

(74) gives the denotations of the type of structures we have seen in the preceding paragraphs (these are quoted from Muskens, 1996, SEM 1-4, with a few notational modifications). R is a metavariable for predicates, δ, discourse referents, γ, conditions, and K, DRSs. Embeddings will be written as a, a', a'' etc., and $a[\delta_1, ..., \delta_n]a'$ means 'assignment a' differs at most from a in the values assigned to $\delta_1, ..., \delta_n$'. $[[\delta]]^a$, the interpretation of δ with respect to embedding a, equals $a(\delta)$ if δ is a variable, and $I(\delta)$ if δ is a constant.

(74)

a. $[[R(\delta_1, ..., \delta_n)]] = \{a|\langle [[\delta_1]]^a, ..., [[\delta_n]]^a\rangle \in I(R)\}$

b. $[[\delta_1 \text{ is } \delta_2]] = \{a|[[\delta_1]]^a = [[\delta_2]]^a\}$

c. $[[\ [\delta_1, ..., \delta_n|\gamma_1, ..., \gamma_m]\ ]] = \{\langle a, a'\rangle|a[\delta_1, ..., \delta_n]a' \wedge a' \in [[\gamma_1]] \cap ... \cap [[\gamma_m]]\}$

d. $[[\neg K]] = \{a|\neg\exists a'.\langle a, a'\rangle \in [[K]]\}$

e. $[[K_1 \Rightarrow K_2]] = \{a|\forall a'.\langle a, a'\rangle \in [[K_1]] \rightarrow \exists a''.\langle a', a''\rangle \in [[K_2]]\}$

f. $[[K_1; K_2]] = \{\langle a, a'\rangle|\exists a''.\langle a, a''\rangle \in [[K_1]] \wedge \langle a'', a'\rangle \in [[K_2]]\}$

As is evident from (74a), a DRS condition is interpreted as a set of embeddings which verify the predicate of the condition. The identity condition, defined in (74b), is the set of embeddings which assign the two arguments of the condition to the same individual.

(74c) gives the interpretation of a DRS, which is a pair of embeddings a and a' such that a' possibly extends a with new discourse referents and verifies the conditions of

[33] I follow closely the description of the interpretation in classical DRT in Muskens (1996, p. 147-151).

[34] Or to events, time intervals etc. I will in this section only consider individuals.

the DRS. This accounts for the information change potential of DRSs: The DRS is not interpreted atomically, but extends and updates the previous discourse with new discourse referents and conditions.

In both negation (74d) and conditionals (74e) there is quantification over temporary embeddings which do not update the global discourse context. Consequently, discourse referents introduced within such structures are not available in the matrix context. This gives us the accessibility constraints discussed above: since the embeddings within negated structures or conditionals do not update the global discourse context, they are not accessible for anaphora resolution. Scope relations also follow from these interpretation rules, as the subordinate embeddings extend the superordinate embeddings.

The sequencing operator in (74f) extends a DRS K_1 with a DRS K_2 by means of an intermediary embedding which is the output of K_1 and the input to K_2. This interpretation of the sequencing operator accounts for the information change potential of sentences: when the DRS of a sentence is a sequence with the context DRS, the context is updated with the discourse referents and conditions introduced in that sentence. The sequencing operator is also used to interpret sentence conjunction.

A DRS K is considered to be true in DRT, given a model M, if and only if there is an embedding a such that a updates the empty embedding Λ and $\langle \Lambda, a \rangle \in [[K]]^M$. This truth definition ensures that discourse referents are interpreted as existentially quantified variables, as it requires the existence of an embedding (cf. Kamp et al., 2011, p. 149). I have not exemplified here how the interpretation works, but examples will be given in a very similar, but compositional, setting in subsection 4.4.3.

We will look at compositional versions of DRT in what follows. In those versions of the theory, the assignment of individuals to discourse referent is not handled in the interpretive metalanguage, but in the object language itself. As mentioned above, embeddings in classical DRT are partial functions, only assigning individuals to the discourse referents introduced in the discourse. A challenge in the compositional reinterpretation of DRT is how to deal with this partiality.

4.3.3 Compositional DRT

As pointed out above, the representational level is essential in classical DRT. Interpretation applies to DRSs, not directly to sentences or the words and constituents of which they consist. This makes classical DRT a non-compositional theory: meaning is not derived directly from lexical meaning and syntactic composition, but relies on representations.

Muskens (1996) manages to combine some of the advantages of a dynamic semantics with compositionality in his Compositional DRT (CDRT). In CDRT, embeddings are taken to be part of the object language rather than the interpretive meta-language, and DRSs are considered abbreviations of a certain kind of lambda-terms. In this way, a type-theoretic interpretation of DRSs and discourse referents is obtained, and consequently, it is possible to construct the meaning of individual words and combine them through function application in the same way as in standard compositional frameworks.

Haug (2013) has pointed out certain shortcomings of CDRT. Perhaps the most important one is that the semantic treatment of anaphora resolution from classical DRT does

not carry over to CDRT. Muskens (1996) handles anaphora through coindexing in the input structures to semantics. In other words, anaphora resolution is made a syntactic issue.[35] Also, there are some other problems with CDRT of a more formal nature, which Haug (2013) also addresses.

In response to these issues, Haug (2013) proposes a compositional version of DRT, Partial CDRT, which draws on CDRT, but uses a partial rather than a classical type logic. In PCDRT, a semantic treatment of anaphora is reintroduced, and the technical issues with CDRT are addressed. In the following presentation of PCDRT, I will present in detail the treatment of anaphora, which will be central in my account. The other innovations of PCDRT will get a more superficial treatment, as the formal aspects of the theory are not my primary concern.

4.4 Partial CDRT

This section lays out the fundamental aspects of PCDRT. Modality and event semantics will be added to this framework in sections 4.5 and 4.6.

In PCDRT, as in CDRT, assignments are handled in the object language rather than in the interpretational metalanguage. To obtain this, two types are added to the theory in addition to individuals and truth values: *states* (type σ) and *registers* (type π). A register is the type given to discourse referents in PCDRT and CDRT. The analogy between a discourse and a computer program is useful: registers are like memory locations, which at a given state can hold a specific value. When the program applies, i.e., when the discourse is updated, a new value can be assigned to a previously unassigned register. A state is the list of values for registers at any given point in the discourse. The non-logical constant v assigns individuals to registers at a given state. The individual assigned to a register x in a state i is called *the inhabitant of x in i*.

DRSs like (75a) are considered as abbreviations of lambda terms of the type in (75b):

(75)

a. $[x_1|man(x_1), ran(x_1)]$

b. $\lambda i.\lambda o.\partial(i[x_{i_1}]o) \ \wedge \ man(v(o)(x_{i_1})) \ \wedge \ ran(v(o)(x_{i_1}))$

i and o are variables over states, and DRSs are functions of type $\langle\sigma, \langle\sigma, t\rangle\rangle$. The first conjunct of (75b) corresponds to the universe of (75a): it says that the output state, o adds an inhabitant to the first uninhabited register of i, x_{i_1}. The two following conjuncts correspond to the conditions of the DRS. They assert that the inhabitant of x_{i_1} in o, that is v applied to o and x_{i_1}, is a man and that he ran.

The system of states and registers takes over the task performed by embeddings in classical DRT. We saw above that embeddings are partial functions, assigning individuals only to introduced discourse referents. In CDRT, on the other hand, an individual is

[35] Muskens (2011) proposes an alternative approach to anaphora resolution without coindexing. Haug (2013, sect. 2.1) shows that also on Muskens' revized approach, constraints on anaphora resolution must be stated in syntactic, not semantic terms.

assigned to every register, which leads to certain technical problems. This is amended in PCDRT, where states function as partial assignments, assigning inhabitants only to registers which are declared in a universe. To model this, Haug uses a partial logic. The partial operator ∂ in the first conjunct of (75b) is responsible for the partiality of states. To explain how this works, we first have to look a bit more closely at the partial logic Haug assumes, as well as the system of states and registers.

4.4.1 Partial type theory

A full type theory based on Haug (2013, sect. 4) is given in appendix A.1. Here, I comment on a few important aspects the type theory.

If states are to function like the partial assignments of classical DRT, a semantic representation should not be interpretable if it makes reference to a register in a state which has not been previously introduced. To capture this, a special undefined object, #, is introduced. Each type α has an undefined object $\#_\alpha$. Haug uses a weak Kleene logic, where undefined objects are considered nonsensical (Priest, 2001). Undefinedness is contagious: If # occurs in a semantic representation, it makes the entire representation uninterpretable. Registers which have not yet been introduced in a state map to $\#_e$, the undefined individual, and a representation containing such registers will therefore not be meaningful.

An operator which depends on the partial logic of PCDRT, and which will figure quite prominently in this dissertation, is the *partial operator*, ∂ (Beaver, 1992). Given some formula A, $\partial(A)$ maps to true if A is true and to $\#_t$, the undefined truth value, otherwise. The partial operator plays an important role in the technical machinery of PCDRT, but it can also be applied to conditions in DRSs to make them presuppositional. It will frequenty be used to model presuppositional conditions in subsequent chapters.

4.4.2 States and registers

A state is a list of values for registers at a given point in the discourse. The non-logical constant v serves a crucial role in the system of states and registers: it assigns individuals to registers in states, thereby mimicking the task of embeddings in classical DRT. Here, I will explain the behavior of v with respect to individual registers, but it can also be used for registers of other types, such as events and times. In section 4.6, I will explain the treatment of events, but times will not be discussed in this dissertation.

v is a partial function of type $\langle\sigma, \langle\pi, e\rangle\rangle$: If $v(s)(\delta)$ is defined, it assigns an inhabitant of type e to register δ of state s. If $v(s)(\delta)$ is undefined, it maps $\#_e$, the undefined individual, to register δ of state s. In the former case, δ is said to be *inhabited in* s.

The domain of registers is well-ordered under the relation $<$. We can therefore talk of the order of registers of a state. Given some state i, x_{i_1} is the first uninhabited register of i, x_{i_2} is its second uninhabited register, and so on. For the formal implementation of this ordering, see appendix A.2 or Haug (2013, p. 477-478).

Because the order of registers is defined independently of states, it will be the same across states. Consequently, if we have three states i, j and k, where j differs from i only

by assigning an inhabitant to x_{i_1}, and k from j only by assigning an inhabitant to x_{j_1}, then k differs from i only by assigning inhabitants to x_{i_1} and x_{i_2}. We can, in other words, always relate registers to the input state (Haug, 2013, p. 479-480). In this way, states and registers can be used to model DRS subordination in a strictly parallel manner to classical DRT, where the embeddings of a subordinate DRS extend that of the superordinate DRS, cf. subsection 4.3.2. The notation $i[\delta_1 ... \delta_n]o$ is used to show the difference between input and output states. $i[x_{i_1}, x_{i_2}]o$ means that the output state o differs from the input state i only in the assignment of individuals to the registers x_{i_1} and x_{i_2}, the two first empty registers of i. See appendix A.2 or Haug (2013, ex. (15)) for the formal definition of this notation.

The system of states and registers needs to be restricted somewhat. To do this, Haug (2013, p. 478) formulates three axioms based on Muskens (1996). The axioms are repeated in appendix A.2. Here, I will limit myself to explaining what they do. First, there is an empty state, $s_\oslash$, in which all the registers are uninhabited. This is needed for the definition of truth in PCDRT, as discussed in subsection 4.4.5. Second, all combinations of registers and individuals are possible. In other words, one never runs out of states. Third, there are no gaps in the succession of inhabited registers. If some register, say x_{i_3}, is inhabited in a state o, then x_{i_2} and x_{i_1} are also inhabited in that state.

As we have seen, DRSs are abbreviations for complex lambda expressions in (P)CDRT, which means one can work with the familiar and relatively simple notation from DRT and at the same time preserve compositionality. The full lambda notation is more expressive, however, so I will occasionally give the full representation of elements of my analyses.

Let us now look again at the abbreviated and full PCDRT representations in (75), repeated below:

(76)

a.

x_1
$man(x_1)$ $ran(x_1)$

b. $\lambda i.\lambda o.\partial(i[x_{i_1}]o) \ \wedge \ man(v(o)(x_{i_1})) \ \wedge \ ran(v(o)(x_{i_1}))$

As we have seen, the first conjunct corresponds to the universe, and updates the input state i with an inhabitant in its first uninhabited register, x_{i_1}. This conjunct includes the partial operator ∂. This guarantees that the assignment of inhabitants to registers in states is a partial assignment: if an undeclared register is used in a condition, e.g., if some condition in (76b) made reference to $v(o)(x_{i_2})$, it would not be true anymore that i differs from o only in the assignment of an individual to x_{i_1}, as the first conjunct states. Since the partial operator is used, a representation which makes reference to uninhabited registers will map to the undefined truth value, rendering the representation uninterpretable.

4.4.3 Abbreviations and composition

With this much in place, we can introduce the abbreviated DRS notation of PCDRT and explain the compositional principles of the theory. I will sometimes use linear DRS notation, sometimes boxes. (77) lists the equivalences between DRSs and PCDRT lambda expressions from Haug (2013, ex. (41)).[36] K and L stand for DRSs, R for conditions and δ_n for discourse referents. $x_1...x_n$ abbreviates variables x with continuous subscripts. K^α_β is a DRS containing $x_\alpha...x_\beta$ in conditions, where α is a number above 0.

(77) **Abbreviated and full notation of DRSs in PCDRT (first version):**

a. $[x_1...x_n|\Gamma_1, ..., \Gamma_\gamma] \ = \ \lambda i.\lambda o.\partial(i[x_{i_1}...x_{i_n}]o) \ \wedge \ \Gamma^*_1(o) \ \wedge \ ... \ \wedge \ \Gamma^*_\gamma(o)$

b. $R(\delta_\alpha, ..., \delta_\beta) \ = \ \lambda i.R(v(i)(\delta_\alpha), ..., v(i)(\delta_\beta))$

c. $\partial(R(\delta_\alpha, ..., \delta_\beta)) \ = \ \lambda i.\partial(R(v(i)(\delta_\alpha), ..., v(i)(\delta_\beta)))$

d. $\delta_\alpha{=}\delta_\beta \ = \ \lambda i.v(i)(\delta_\alpha) \ = \ v(i)(\delta_\beta)$

e. $\neg K \ = \ \lambda i.\neg\exists j.K(i)(j)$

f. $K \ \vee \ L \ = \ \lambda i.\exists j.K(i)(j) \ \vee L(i)(j)$

g. $K^\alpha_\beta \ \Rightarrow \ L^\delta_\epsilon \ = \ \lambda i.\forall j.K(i)(j) \ \rightarrow \ \exists k.L^+(j)(k)$

h. $K^\alpha_\beta \ ; \ L^\delta_\epsilon \ = \ \lambda i.\lambda o.\exists k.K(i)(k) \ \wedge \ L^+(k)(o)$, which is equivalent to $\lambda i.\lambda o.K(i)(o) \ \wedge \ L(i)(o)$ (cf. Haug, 2013, ex. (41) and appendix A)

The abbreviations in (77) are very similar to the interpretation of DRSs in classical DRT that we saw in subsection 4.3.2: states in PCDRT function like embeddings, in that they assign inhabitants to registers/discourse referents. Furthermore, DRSs in PCDRT abbreviate functions which map input states to functions from output states to truth values, while DRSs in classical DRT are interpreted on pairs of input and output embeddings. The crucial difference is that the pairs of embeddings in classical DRT interpret DRSs, while state functions are part of the object language in (P)CDRT, of which the DRS notation is an abbreviation. By introducing states and registers into the object language, we obtain a type-theoretic interpretation of discourse referents, DRSs and conditions, and we can therefore introduce compositionality into the DRT semantics. At the same time, the equivalence between interpretation in classical DRT and the full notation in (P)CDRT means that it is in most cases a trivial task to translate analyses between the two frameworks.

Before moving on to how compositionality works in PCDRT, it is necessary to comment on the numbering of discourse referents in the translation between the two types of representation. Note the difference between the names given to discourse referents in the universe of the abbreviated notation and the full one in (77a): In the full notation, discourse referents start with x_{i_1}, which we have seen is the first uninhabited register of i. In the abbreviated notation, discourse referents do not make reference to states. When translating discourse referents from the abbreviated notation to the full notation,

[36] These equivalences will be updated below, when modality is added to the PCDRT framework.

we must therefore add a subscript state.[37] Discourse referents in embedded DRSs are always numbered relative to the input state of the matrix DRS. This is possible since embedded DRSs are extensions of the input state. The rules $*$ and $+$ occur in some of the equivalences in (77). These are used in the translation of discourse referent numbers between the two representations. The details of the numbering rules are given by Haug (2013, p. 484-488).

Let us now turn to the the composition of semantic representations. Since our semantic expressions now consist of elements with semantic types, it is possible to lambda-abstract over those elements. The sequencing operator in (77h) is very similar to the corresponding operator in classical DRT (cf. (74f)). In both frameworks it has the function of merging the universes and conditions of two DRSs, and it is used for updating a context DRS with a new DRS and for sentence coordination.

We are now equipped with what we need to compute the semantic representation of a sentence such as (78) from its constituent parts:

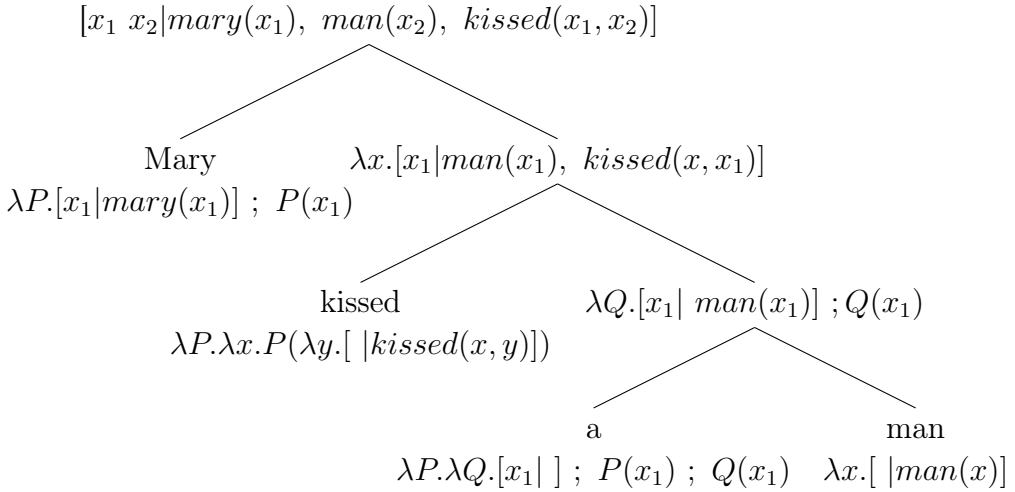
(78) Mary kissed a man.

I assume that proper names are generalized quantifiers. The lexical items get the following denotations (type specifications are not shown, as these become exceedingly complex.)

(79) $[[\text{Mary}]]^{M,a} = \lambda P.[x_1|mary(x_1)]\ ;\ P(x_1)$
$[[\text{kissed}]]^{M,a} = \lambda P.\lambda x.P(\lambda y.[\ |kissed(x,y)])$
$[[\text{a}]]^{M,a} = \lambda P.\lambda Q.[x_1|\ ];\ P(x_1)\ ;\ Q(x_1)$
$[[\text{man}]]^{M,a} = \lambda x.[\ |man(x)]$

The composition is given in (80).

(80)



Something needs to be said about the topmost function application. The subject contains a discourse referent x_1, which combines with a predicate which also contains a

[37] The equivalence between names of discourse referents in the full and the abbreviated notations is actually a bit more complicated in Haug (2013) than in (77), as he also considers cases where discourse referents in the abbreviated notation start with a number higher than 1.

discourse referent x_1. When the quantifier subject takes the predicate as an argument, we must renumber the discourse referent in the predicate to x_2 in the abbreviated notation. This renumbering is a reflection of the correspondence between the abbreviated and the full notation: in the top function application of (80) in the full notation, x_1 in the subject's DRS and x_1 in the predicate's DRS are numbered relative to different states. When the two nodes are sequenced, discourse referents of both are made relative to the input state of the embedding DRS, the subject in this case, cf. (77h), and we can therefore renumber discourse referents relative to that imput state. Assuming that the input state of the subject is i, x_1 in the predicate's DRS can become x_{i_2}, which in turn becomes x_2 in the abbreviated notation (Haug, 2013, p. 487-488).

4.4.4 Anaphora resolution

We saw above that anaphors are resolved in classical DRT by equating the anaphoric discourse referent with an accessible discourse referent in the context. This must be done before subsequent sentences are merged.

Haug (2013) models anaphors somewhat differently: they are registers with an underspecified resolution to an antecedent and are not resolved before new sentences are merged. This way of modelling anaphora resolution has some technical advantages, but it is also motivated by a specific view of the interface between semantics and pragmatics. Haug (2013, sect. 5.4) argues for a distinction between monotonic and non-monotonic content and contends that semantic DRS representations should track monotonic content only, while non-monotonic processes should be relegated to a pragmatic component.

Anaphora resolution is an example of a non-monotonic process: added premises can lead to different resolutions. Haug illustrates this with the example in (81). If we disregard (81b), it is reasonable to resolve *him* in the second sentence of (81a) to *a man*. However, if we take the second sentence into consideration, a resolution to *Pedro* becomes a more salient antecedent for *him*.

(81)

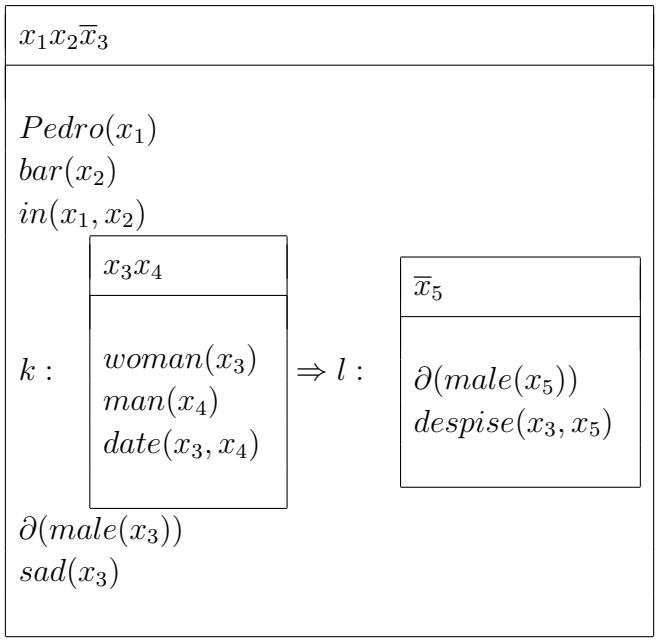
a. Pedro is in a bar. Every woman who ever dated a man despises him.

b. He is sad. (Haug, 2013, ex. (47))

(81) gets the DRS representation in (82) (Haug, 2013, ex. (61)).[38] As explained in subsection 4.4.3, discourse referents in embedded DRSs are numbered relative to the matrix DRS in the abbreviated notation. However, since embedded DRSs introduce temporary states, the numbering of discourse referents in the matrix universe is not affected by discourse referents in embedded DRSs. Consequently, there is a discourse referent x_3 in one of the embedded DRSs as well as in the matrix DRS. To distinguish the discourse referents, I have added a letter for the output state in front of each DRS.

[38] Anaphoric discourse referents are overlined in the universe, a convention I will follow throughout this dissertation.

(82) o:

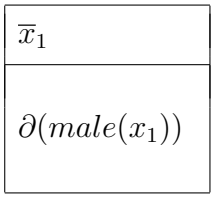


If the anaphor x_5 in l had to be resolved before sequencing (81b), as it would in classical DRT, we would have to alter the structure of the preceding discourse when the resolution hypothesis changed. By leaving anaphora resolution and other non-monotonic processes out of the semantic structure, it is possible to account for such changes in assumptions without altering the structure.

While anaphora resolution is non-monotonic and therefore should be treated in a pragmatic component, it must somehow be constrained by the monotonic content, as it is sensitive to accessibility. Haug proposes that there is an interpretational module which contains semantic and pragmatic considerations, a *full interpretation*. This module is modelled as a tuple $\langle K, P\rangle$, where K is a DRS and P is a set of pragmatic enrichments. P contains an anaphoric resolution function $\mathcal{A}$.

$\mathcal{A}$ maps from an anaphoric register x in a state s to the antecedent of x in s. In other words, it maps from an anaphoric discourse referent to an accessible antecedent. Given this, it is tempting to think of $\mathcal{A}$ as a function picking accessible antecedent discourse referents directly in the DRS. It is important to note that the technical implementation of $\mathcal{A}$ is somewhat more complicated. $\mathcal{A}$ is in fact a complex function which depends on a mapping from the word introducing the anaphoric register (e.g., *him* in (81a)) to the word introducing the antecedent register (e.g., *a* or *Pedro* in (81a)). See Haug (2013, p. 482-484) for the empirical motivation for this analysis, and appendix B.1 for the formal implementation assumed here. (83a) is the abbreviated semantic representation of the anaphor *he* in PCDRT, and (83b) is the full representation:

(83)

a. $[[he]]^{M,a} = \lambda P.$  $; P(x_1)$

b. $[[he]]^{M,a} = \lambda P.\lambda i.\lambda o.\exists k.\partial(i[x_{i_1}]k) \wedge ant(k)(x_{i_1}) \wedge \partial(male(v(k)(x_{i_1})) \wedge P(k)(o)(x_{i_1})$

In the full representation, the anaphor is associated with the condition *ant*, which is responsible for the anaphoric semantics. In Haug (2013), this condition was interpreted *in situ*, but Haug (2014b) remarks that an *in situ* interpretation does not work in modal environments, because the anaphoric resolution ends up in the modal context. Instead, the interpretation is lifted to the truth definition, cf. subsection 4.4.5:

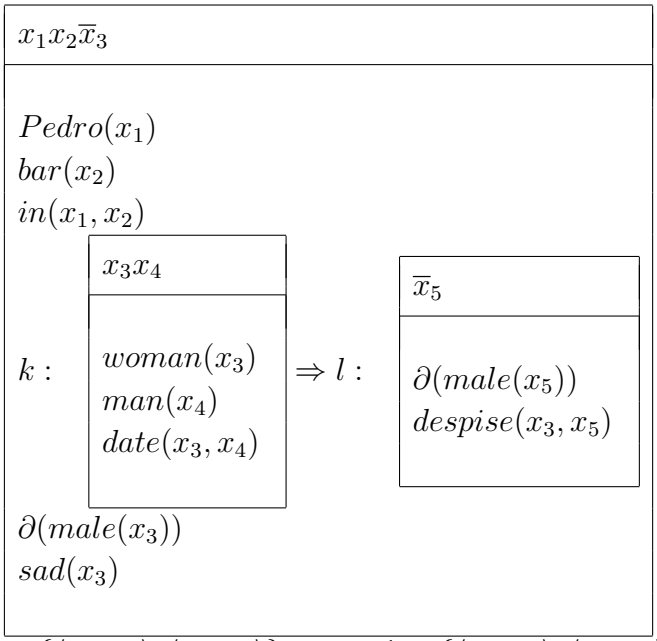
(84) $\forall x_\pi.\forall s.ant(s)(x) \rightarrow \partial(v(s)(x) = v(s)(\mathcal{A}(s)(x)) \wedge \mathcal{A}(s)(x) < x)$ (cf. Haug, 2014b, ex. (54))

$ant(s)(x)$ maps to true if the inhabitant of x in s is the same as the inhabitant of the antecedent $\mathcal{A}(s)(x)$. Furthermore, (84) requires the antecedent to precede the anaphor in the semantic structure. Due to the presence of the partial operator in (84), the anaphoric condition has presuppositional status: if $\mathcal{A}$ does not pick a suitable antecedent for the anaphor, the *ant* condition gets the undefined truth value.

Anaphors can be associated with further presuppositional conditions such as $\partial(male(x_1))$ in (83). Such conditions restrict the antecedence possibilities of the anaphor such that it can only take antecedents which conform with the condition. A resolution to a female antecedent of of the anaphor in (83) would result in the value $\#_t$ for $\partial(male(x_1))$.

We can now make explicit the anaphoric semantics of (82). (85) is the same DRS as in (82), with possible $\mathcal{A}$-functions added under the DRS.

(85) o:



i: $\mathcal{A} = \{\langle x_5, x_4\rangle, \langle x_3, x_1\rangle\}$ or ii: $\mathcal{A} = \{\langle x_5, x_1\rangle, \langle x_3, x_1\rangle\}$

The anaphoric register x_5 in l is left underspecified in the DRS, and there are two possible actual resolutions: *i*, where x_5 in l is resolved to x_4, or *ii*, where it is resolved to x_1. A resolution of x_5 to x_2 in o or x_3 in k is illicit, although the antecedents are accessible, because the inhabitants of those registers are incompatible with the presuppositional restriction of $\partial(male(x_5))$. The anahoric register x_3 in o cannot be resolved to x_4 in k, since the universe of k is not accessible from o.

There is also an anaphor in the matrix DRS, x_3, corresponding to *he* in (81b). Since material in the embedded structures is inaccessible to x_3, there is only one antecedent which is consistent with the presuppositional condition $\partial(male(x_3))$, x_1.

It is common in DRT to treat complex presuppositional expressions such as definite descriptions on par with anaphora (see e.g. van der Sandt, 1992). Haug (2014b) proposes a way of integrating presuppositions into the framework for anaphora resolution. I will return to this in chapter 6.

4.4.5 Truth in PCDRT

A DRS K is true given an input state i iff there exists an extension o of i such that $K(i)(o)$ is true and the anaphoric condition (84) is true. A DRS K is true simpliciter iff there exists an extension o to the empty state $s_\varnothing$ such that $K(s_\varnothing)(o)$ is true.

Example (78), repeated in (86a), has the truth conditions in (86b) (Haug, 2013, sect. 5.5):

(86)

a. Mary kissed a man.

b. (86a) is true iff:
$\exists o.\partial(s_\varnothing[x_{\varnothing_1}, x_{\varnothing_2}]o) \wedge mary(v(o)(x_{\varnothing_1})) \wedge man(v(o)(x_{\varnothing_2}))$
$\wedge\ kissed(v(o)(x_{\varnothing_1}))(v(o)(x_{\varnothing_2}))$

Furthermore, according to *the unselective binding lemma*, proven for PCDRT by Haug (2013, appendix C), we can dispense with state and registers in the calculation of truth values (relative to a given anaphoric resolution):

(87) $\exists o.\partial(s_\varnothing[u_1...u_n]o)\ \wedge\ \phi\ =\ \exists x_1...\exists x_n.\phi^*$
where ϕ^* is obtained by substituting $v(o)(u_1)$ and ... and $v(o)(u_n)$ by x_1 and ... and x_n. (Haug, 2013, ex. (91))

Consequently, (86b) is true exactly when (88) is true:

(88) (86a) is true iff:
$\exists x_1.\exists x_2.Mary(x_1)\ \wedge\ man(x_2)\ \wedge\ kissed(x_1, x_2)$

4.5 Modality in PCDRT

The framework built above is not expressive enough to handle the semantics of indirect discourse, as it does not take modality into account. In this section, I will propose a version of PCDRT with possible worlds, which will be the starting point for the analyses in the chapters to come. There are a number of possible ways to add modality to PCDRT. I have opted for an extensional modal semantics in which the type theory contains a domain of worlds D_s (cf. appendix A.1), and world variables and world abstractors are added to the

full PCDRT notation.[39] So far, DRT conditions have been of type $\langle \sigma, t \rangle$, functions from states to truth values. From now on, they will be of type $\langle s, \langle \sigma, t \rangle \rangle$, functions from worlds to states to truth values:

(89) $R(\delta_\alpha, ..., \delta_\beta) \ = \ \lambda w.\lambda i.R(v(i)(\delta_\alpha), ..., v(i)(\delta_\beta))(w)$

To accommodate worlds, I need to reformulate the abbreviations in (77). These reformulations follow Kamp et al. (2011, def. 19) to a large extent. Not all conditions should be relativized to worlds. This is true, e.g., for proper names. I therefore add a special family of predicates N, which are not relativized to worlds (cf. Kamp et al., 2011, p. 155). To get the types right, I vacuously quantify over worlds in such cases.

(90) **Abbreviated and full notation of DRSs in modal PCDRT (final version)**

a. $[x_\alpha ... x_\beta | \Gamma_1, ..., \Gamma_\gamma] \ = \ \lambda w.\lambda i.\lambda o.\partial(i[x_{i_1} ... x_{i_n}]o) \ \wedge \ \Gamma_1^*(w)(o) \ \wedge \ ... \wedge \ \Gamma_\gamma^*(w)(o)$

b. $R(\delta_\alpha, ..., \delta_\beta) \ = \ \lambda w.\lambda i.R(v(i)(\delta_\alpha), ..., v(i)(\delta_\beta))(w)$

c. $\partial(R(\delta_\alpha, ..., \delta_\beta)) \ = \ \lambda w.\lambda i.\partial(R(v(i)(\delta_\alpha), ..., v(i)(\delta_\beta))(w)))$

d. $N(\delta_\alpha, ..., \delta_\beta) \ = \ \lambda w.\lambda i.N(v(i)(\delta_\alpha), ..., v(i)(\delta_\beta))$

e. $\delta_\alpha{=}\delta_\beta \ = \ \lambda w.\lambda i.v(i)(\delta_\alpha) \ = \ v(i)(\delta_\beta)$

f. $\neg K \ = \ \lambda w.\lambda i.\neg \exists j.K(w)(i)(j)$

g. $K \ \vee \ L \ = \ \lambda w.\lambda i.\exists j.K(w)(i)(j) \ \vee \ L(w)(i)(j)$

h. $K_\beta^\alpha \ \Rightarrow \ L_\epsilon^\delta \ = \ \lambda w.\lambda i.\forall j.K(w)(i)(j) \ \rightarrow \ \exists k.L^+(w)(j)(k)$

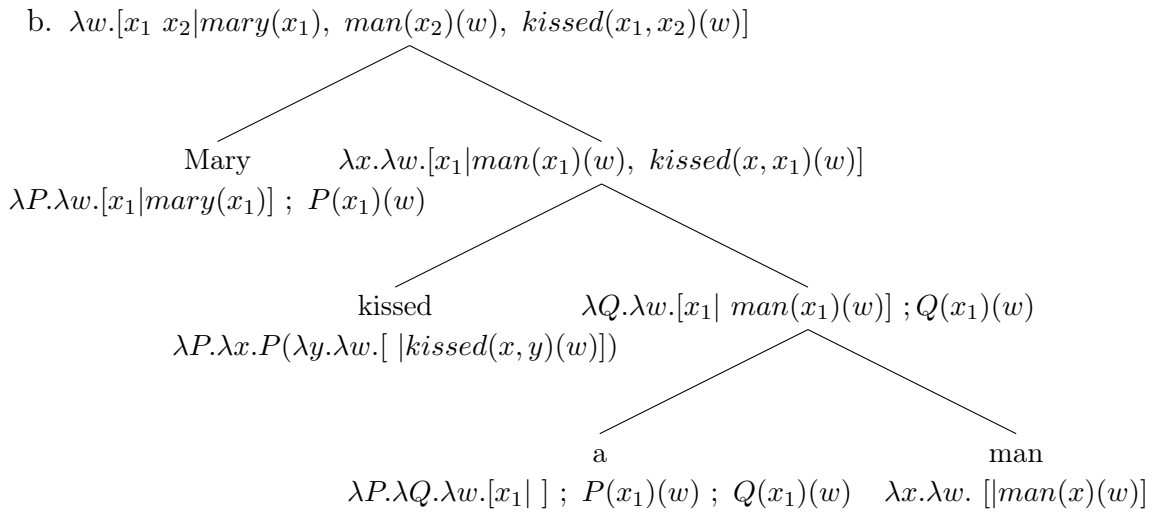
i. $K_\beta^\alpha \ ; \ L_\epsilon^\delta \ = \ \lambda w.\lambda i.\lambda o.\exists k.K(w)(i)(k) \ \wedge \ L^+(w)(k)(o)$, which is equivalent to $\lambda w.\lambda i.\lambda o.K(w)(i)(o) \wedge L(w)(i)(o)$

All representations now contain a world lambda abstractor, and most conditions contain a world argument. (91) shows the compositional analysis of a sentence, given this modal semantics. Here I have added world abstractors in the abbreviated notation, to be explicit about the treatment of worlds without having to use the cumbersome full notation.

(91)

a. Mary kissed a man.

[39] However, there is no such thing as a world register, as there is no need for world discourse referents, at least not in the analyses in this dissertation.



As before, nominal arguments are taken to be generalized quantifiers; they contain abstractors over predicates and apply the discourse referent they introduce to those predicates. However, they also contain a world abstractor, and apply the world to the predicates. The final result of the composition is what we might call a *dynamic proposition*, a function from worlds to input and output states to truth values.

In later chapters we will apply this semantics to attitude predicates. To illustrate how modal operators work in this system, let us introduce a simpler modal operator, namely a necessity operator:

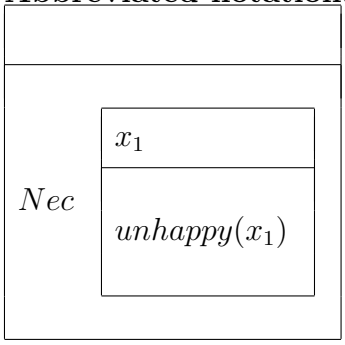
(92) $NecK = \lambda w.\lambda i.\forall w'.\exists j.K(w')(i)(j)$

This complex condition quantifies over worlds w' and states that the DRS K must hold in w'. (93) is an example with a necessity operator.

(93)

a. Someone is necessarily unhappy.

b. **Abbreviated notation:**



c. **Full notation:**
$\lambda w.\lambda i.\lambda o.\partial(i[]o) \wedge \forall w'.\exists j.\partial(o[x_{o_1}]j) \wedge unhappy(v(j)(x_{o_1}))(w')$

A discourse referent x_1 is added to the embedded DRS, together with the condition $unhappy(x_1)$. In the full notation, we see that this condition is bound to the world of the universal quantifier.

In this section, some additional complexity has been added to DRSs. In previous sections, DRSs denoted functions from input and output states to truth values. Now they also contain a world abstractor in their denotations. This, of course, has consequences for the truth definition. In subsection 4.4.5, I presented the truth definition of DRSs in non-modal PCDRT, where a DRS K is true simpliciter iff there exists an extension o to the empty state $s_\varnothing$ such that $K(s_\varnothing)(o)$ is true and the anaphoric condition (84) is true. This does not make sense any more, since the formulae also contain a world abstractor.

To account for the truth conditions of a DRS in modal PCDRT, I propose that a matrix DRS must be anchored to a world, the actual world, in order to be interpreted. This could be thought of as a contextual anchoring to the world of the utterance context (cf. Kaplan, 1989).

(94) **Truth definition in modal PCDRT:**
A DRS K is said to be true given an input state i and a world w iff there is an extension o of i such that $K(w)(i)(o)$ is true and the anaphoric condition (84) is true. A DRS K is said to be true simpliciter at a world w iff there exists an extension o to the empty state $s_\varnothing$ such that $K(w)(s_\varnothing)(o)$ is true.

The unselective binding lemma, cf. (87), must also be updated:

(95) Given a world w, $\exists o.\partial(s_\varnothing[u_1...u_n]o) \wedge \phi(w) = \exists x_1...\exists x_n.\phi^*(w)$
where ϕ^* is obtained by substituting $v(o)(u_1)$ and ... and $v(o)(u_n)$ by x_1 and ... and x_n. (based on Haug, 2013, ex. (91))

(91a) is true simpliciter given a world w iff

(96) $\exists o.\partial(s_\varnothing[x_{s_{\varnothing_1}} x_{s_{\varnothing_2}}]o) \wedge mary(v(o)(x_{s_{\varnothing_1}})) \wedge man(v(o)(x_{s_{\varnothing_2}}))(w)$
$\wedge kissed(v(o)(x_{s_{\varnothing_1}}), v(o)(x_{s_{\varnothing_2}}))(w)$

According to (95), (96) is equivalent to:

(97) Given a world w, (91a) is true iff:
$\exists x_1.\exists x_2.mary(x_1) \wedge man(x_2)(w) \wedge kiss(x_1, x_2)(w)$

4.6 Neo-Davidsonian event semantics in PCDRT

4.6.1 Introduction

In following chapters, I will argue for an event semantic approach to long-distance binding, and it is therefore necessary for my theory to handle events. In this section, I will present a PCDRT implementation of a so-called Neo-Davidsonian event semantics (Davidson, 1967; Parsons, 1990), according to which verbal predicates are predicates over events, and individual arguments are associated with the verbal event via thematic roles. I will assume that there are dedicated event discourse referents. The sentence *Mary loves John* has an abbreviated representation as in (98):

(98)

$e_1 x_1 x_2$
$mary(x_1)$ $john(x_2)$ $exp(e_1) = x_1$ $th(e_1) = x_2$ $loving(e_1)$

In addition to the two individual discourse referents, there is an event discourse referent, e_1. x_1, Mary, is the experiencer of e_1, and x_2, John, is e_1's theme. Furthermore, e_1 is associated with the event description *loving*. Note that I present thematic roles as functions from events to individuals, not relations, following Champollion (2015). In other words, thematic roles can only be assigned to one individual (see, e.g., Carlson, 1984; Parsons, 1990). I will return to the composition of structures such as (98) below.

4.6.2 Introducing events in PCDRT

The PCDRT formalism needs to be extended and modified in order to accommodate events. In particular, we need to add a type for eventualities.[40] Since there are event discourse referents, we also need to distinguish between individual and event registers (see appendix A.1, (273b) and (273d)).

The function v, which handles assignments of inhabitants to registers in PCDRT (cf. subsection 4.4.2), must also be modified. Here, I follow a suggestion from Haug (2013, p. 477-478). There is a v_α function for each type α for which there is a corresponding register.[41] v_α is of type $\langle \sigma, \langle \pi_\alpha, \alpha \rangle \rangle$: Given an input register δ_α and a state s, $v_\alpha(s)(\delta_\alpha)$ assigns an inhabitant of type α to δ_α in s. When there is no reason for confusion, I will omit type subscripts on the v function.

Given these modifications to the formal system, we can represent the DRS in (98) in the full notation of (modal) PCDRT:

(99) $\lambda w.\lambda i.\lambda o.\partial(i[e_{i_1} x_{i_1} x_{i_2}]o) \wedge mary(v(o)(x_{i_1})) \wedge john(v(o)(x_{i_2})) \wedge exp(v(o)(e_{i_1})) = v(o)(x_{i_1})$
$\wedge\, th(v(o)(e_{i_1})) = v(o)(x_{i_2}) \wedge loving(v(o)(e_{i_1}))(w)$

When it comes to the interaction between modality and event semantics, I assume that the event description, but not the thematic role conditions, takes a world argument. This is consistent with how events are treated, e.g., in the modal semantics for attitude verbs developed by Hacquard (2010).

Since events have a type theoretic status which is strictly parallel to that of individuals, the system of anaphora resolution developed above can be implemented for events, as long as the interpretation of the anaphoric condition in (84) is defined for all register subtypes:

[40] I will not distinguish formally between events and states, but treat all eventualities similarly in this dissertation.

[41] Here, α is a meta-variable over events and individuals, but it could be extended to times and possibly other types for which there are corresponding registers.

(100) For all register subtypes α, $\forall x_{\pi_\alpha}.\forall s.ant(s)(x) \rightarrow \partial(v_\alpha(s)(x) = v_\alpha(s)(\mathcal{A}(s)(x)) \wedge \mathcal{A}(s)(x) < x)$

I will exploit this possibility in chapter 6.

4.6.3 Event semantics and composition

The semantic composition of event-semantic structures is far from trivial, and there are a number of different proposals concerning how the composition should proceed (see, e.g., Parsons, 1995; Kratzer, 1996; Champollion, 2015). Parsons (1995) gives the following denotation for *destroy*:[42]

(101) $\lambda x.\lambda y.\lambda e.D(e) \wedge Agent(e, x) \wedge Theme(e, y)$ (Parsons, 1995, p. 651)

When applied to nominal arguments, the result is a predicate over events:

(102) $[[destroy]]([[God]])([[city]]) = \lambda e.D(e) \wedge Agent(e, God) \wedge Theme(e, city)$ (Parsons, 1995, p. 652)

Verbal modifiers can apply to this predicate, giving a more complex expression:

(103) $\lambda e.D(e) \wedge Agent(e, God) \wedge Theme(e, city) \wedge With(e, bolt)$ (Parsons, 1995, p. 652)

After all arguments and modifiers are applied, the expression is closed off by an existential quantifier, called *existential closure*:

(104) $\exists e.D(e) \wedge Agent(e, God) \wedge Theme(e, city) \wedge With(e, bolt)$

A verbal denotation like (101) is not compatible with the assumptions in this dissertation, where nominals are assumed to denote generalized quantifiers. It is not trivial to introduce generalized quantifiers into Parsons' approach, as a standard generalized quantifier does not have a type which allows it to combine with an event predicate.

In the framework developed here, verbs are predicates over event registers e, and associate an event description with e:

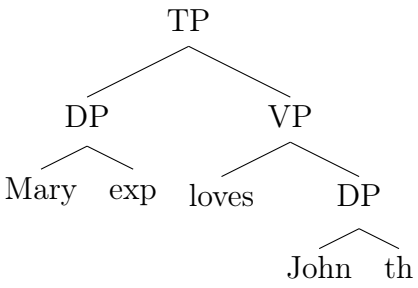
(105) $\lambda e.[|loving(e)]$

Nominal arguments are assigned thematic roles through a syntactic mechanism. A nominal assigned a thematic role is the sister of a thematic head.[43]

[42] Unlike the proposal put forth here, Parsons models thematic roles as relations.

[43] This treatment of thematic roles is inspired by Champollion (2015). I do not adopt his general event-semantic framework, however.

(106)



I am abstracting away from worlds and input/output states when presenting the semantics of (106). Adding these is trivial, but would make the type specifications exceedingly complex. I will, however, use register abstractors, not event/individual abstractors. τ in the type specifications can be seen as an abbreviation for $\langle s, \langle \sigma, \langle \sigma, t \rangle \rangle \rangle$.

The DPs in (106) are standard generalized quantifiers. The theta heads are type lifters, which gives the nominals a type that enables them to combine with event (register) predicates, $\langle \langle \pi_v, \tau \rangle, \langle \pi_v, \tau \rangle \rangle$:

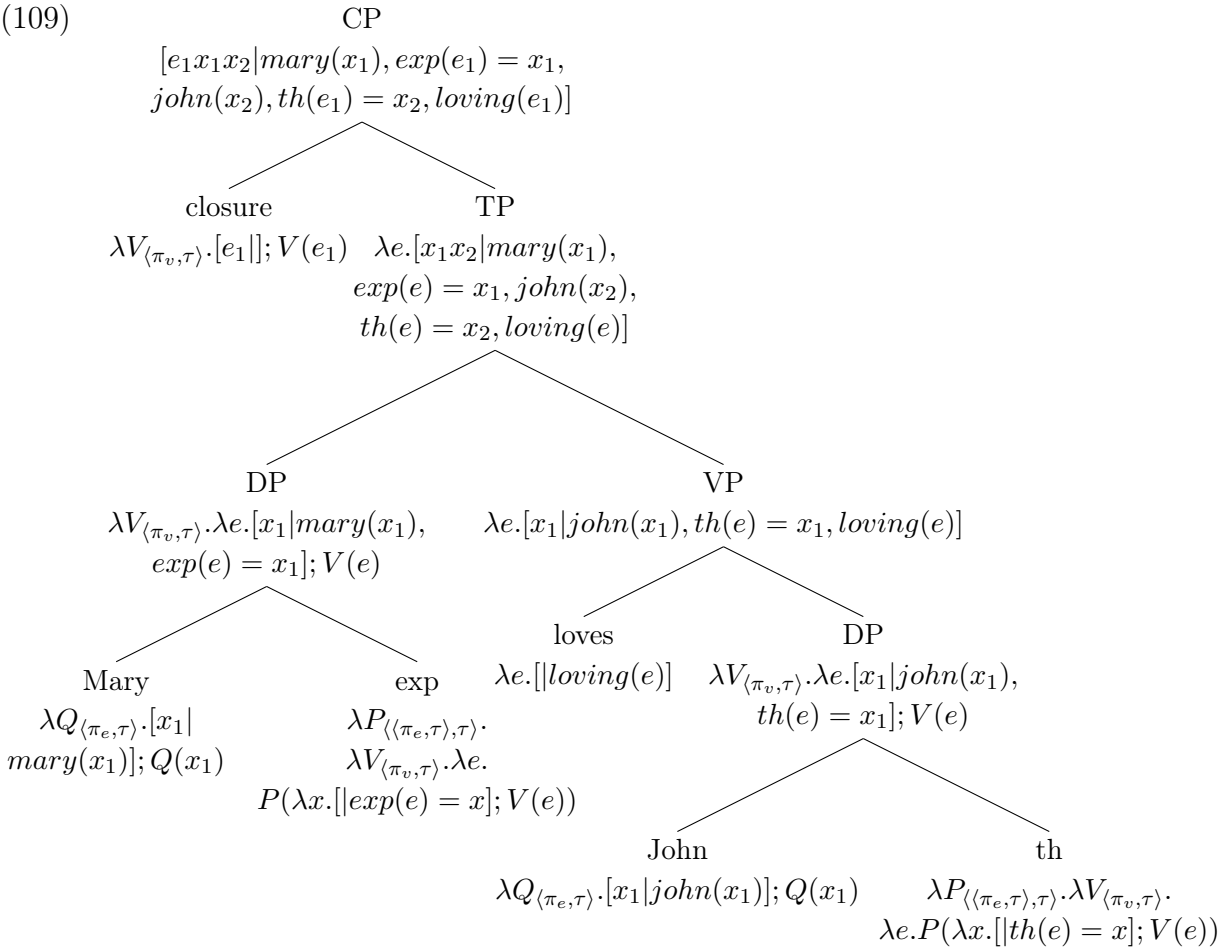
(107) $[[th]]^{M,a} = \lambda P_{\langle \langle \pi_e, \tau \rangle, \tau \rangle}.\lambda V_{\langle \pi_v, \tau \rangle}.\lambda e.P(\lambda x.[|th(e) = x]; V(e))$ (cf. Champollion, 2015, ex. (18))

A silent closure operator is introduced syntactically in the left periphery of the clause. It introduces an event discourse referent which binds off the event variable:

(108) $[[closure]]^{M,a} = \lambda V_{\langle \pi_v, \tau \rangle}.[e_1|]; V(e_1)$

(109) illustrates how this procedure builds representations like (98):

(109)



By applying *Mary* to *exp* and *John* to *th*, these nominal arguments get the right type to combine with the event (register) predicate. The thematic heads also introduce the thematic functions. In the rest of this dissertation, I will abstract away from the internal composition of the DP nodes.

This is intended as a basic formalism for representing the composition of semantic expressions with events, and it is not a complete account of compositional event semantics. One issue which is left unresolved is the interaction between the event quantifier and other scope-taking elements, discussed at length by Champollion (2015). It turns out that the event quantifier always takes the lowest scope. The formalism presented here does not make sense of this observation, and trying to account for it is beyond the scope of this dissertation. It might be that these facts have a syntactic origin, or that a semantic treatment is called for, like the one Champollion (2015) suggests.

4.7 Summary

In this chapter, I have presented PCDRT, the theoretical framework of this dissertation. To the basic PCDRT framework, I have added a treatment of modality and a Neo-Davidsonian event semantics. In this concluding section, I will briefly point out some key differences between classical DRT and this framework which are relevant to the present work.

In classical DRT, DRSs are constructed on the basis of sentences, and the DRSs are subsequently interpreted using embeddings, partial functions from discourse referents to individuals (or events etc.). In PCDRT the assignment of individuals to discourse referents is not done in the interpretive metalanguage. Instead, assignments are handled in the object language itself by means of states and registers. DRSs are abbreviations of lambda expressions containing state variables. An important consequence of this is that we can lambda abstract over DRSs and combine them compositionally using standard lambda calculus.

Since assignment of individuals to discourse referents is done in the object language, discourse referents are not variables over individuals/events, but have a dedicated type specification; they are registers. This type difference will be exploited in subsequent chapters, because it makes it possible to mark discourse referents formally, irrespective of the individual assigned to them.

The treatment of anaphora in PCDRT differs somewhat from that of classical DRT. In PCDRT, anaphors are discourse referents with an underspecified resolution to an antecedent. The actual resolution is handled by a pragmatic anaphora resolution function $\mathcal{A}$, which maps from anaphoric discourse referents to antecedent discourse referents. While informed by pragmatic inferences, this function is also constrained by the accessibility relations of DRSs.

The modal semantics I have opted for is extensional: there are world variables and world lambda abstractors in the semantic representations. However, since there are no world discourse referents, the modal semantics is not transparent in the DRS abbreviations, but only in the full lambda expressions.

In the next chapter, I will return to long-distance reflexivity, and implement an analysis of LDRs with sentence-internal antecedents in PCDRT.

Chapter 5

A new analysis of LDRs with sentence-internal antecedents

5.1 Introduction

This chapter presents the core part of the analysis, namely that of LDRs with intra-sentential antecedents. I will provide answers to all but one of the desiderata for a semantic theory of LDRs presented in section 3.3.

First, I account for the AH-reference of LDRs in indirect discourse, cf. DES1. There are two main components to this account, with the first being an event-based approach to perspective shift. I present the event semantics of attitudinal complements from Hacquard (2006, 2010) and Anand and Hacquard (2008). Based on this semantics, I argue that the agent of an utterance event or the experiencer of a mental state is made available as perspective holders in attitudinal complements. The second component is the anaphoric account of LDRs. I show how LDRs can be modelled as anaphors with a presuppositional restriction to perspective holders. When paired with the event-semantic account of perspective shift, I correctly predict AH-reference in attitudinal complements.

The anaphoric approach to LDRs also provides a plausible explanation for why LDRs are ambiguous when embedded under multiple attitude predicates, cf. DES2. In PCDRT, anaphors are discourse referents with an underspecified resolution to an antecedent. In deeply embedded indirect discourse, there will be multiple possible resolutions, due to recursion of perspective shift.

Finally, neither the event-based approach to perspective shift nor the anaphoricity of LDRs is uniquely linked to attitudinal semantics. It is therefore possible to adapt the approach to perspective shift and LDRs in non-attitudinal environments, cf. DES4. While the main portion of the chapter is concerned with the well-described attitudinal cases, I also draw the outline of an account of non-attitudinal cases of long-distance binding.

DES3, the desideratum addressing LDRs with discourse antecedents, is dealt with in a separate chapter, and so are LDRs in so-called messenger reports.

This chapter is organized as follows: The Hacquardian event semantics of indirect discourse is presented in section 5.2. This semantics serves as background for the account of perspective shift in attitudinal complements and the anaphoric approach to LDRs in

section 5.3. Section 5.4 shows how this approach can account for the distribution and the antecedents of LDRs in Latin attitudinal complements, while section 5.5 deals with LDRs in deeply embedded clauses. In section 5.6, I discuss the issue of obligatorily *de se* readings and LDRs, and certain cross-linguistic facts of long-distance binding in attitudinal complements are considered in 5.7. The approach is extended to non-attitudinal environments in section 5.8, and section 5.9 presents some concluding remarks and compares the present approach to some previous accounts.

5.2 The event semantics of attitudinal complements

5.2.1 Propositional attitude predicates and events

It has been customary to abstract away from events when dealing with the semantics of attitude predicates and indirect discourse. Many central issues in the semantics of attitude reports can indeed be dealt with in a satisfactory manner without making reference to events. One example of such an issue is the question of *de se* and *de re* readings which we looked at in subsection 3.4.1.

Accounting for speech and thought predicates without making reference to events is nevertheless an abstraction. The reasons for assuming events in the semantics, e.g., verbal modification (Davidson, 1967) and aspect (Parsons, 1989), hold equally for speech verbs, mental state verbs and emotion verbs.

Hacquard (2006, 2010) uses events in the semantic representations for a different reason, namely to investigate the behavior of modal auxiliaries embedded under speech and thought predicates, and argues that the attitudinal event has an effect on the modal semantics of the attitudinal complement. Accordingly, she recasts attitudinal semantics in event-semantic terms.

Deal (2014) uses Hacquard's event-based modal semantics to handle a quite different problem, very relevant to the current project: that of shifted indexicals in indirect discourse in the native American language Nez Perce. Shifted indexicals have a number of properties in common with LDRs, cf. section 2.8, and my proposal will in part be based on Deal's.

In the following subsections I will introduce Hacquard's event semantics for attitude predicates and then review Deal's proposal, which will form the basis of my own account.

5.2.2 Contentful events

As previously shown in subsection 3.4.1, in a standard Hintikkan semantics (Hintikka, 1969), a sentence like (110a) is represented as in (110b):

(110)

a. John believes that it is snowing.

b. $\lambda w.\forall w' \in DOX_{John,w}.snowing(w')$
where $DOX_{John,w} = \{w' | w' \text{ is compatible with what John believes in } w\}$

The complement proposition must hold in a modal base consisting of the subject's belief world, the *doxastic alternatives*.

In Hacquard's event semantics for attitude predicates (Hacquard, 2006, sect. 4.2.1.1.; Hacquard, 2010, p. 101-102), the same sentence would be represented as follows:[44]

(111) $\lambda w.\exists e.exp(e) = john \wedge belief(e, w) \wedge \forall w' \in \cap CON(e).\exists e'.snowing(e', w')$

Attitudinal events are a special kind of event associated with a *content*, a set of propositions which the attitudinal event is about. For *believe*, the set consists of the propositions believed by the experiencer of the belief; for *hope*, they are the propositions the experiencer hopes are true etc. In other words, the propositions which constitute the content are different for each predicate type. The function CON maps a contentful event to its content. In (111), $CON(e)$ maps to the propositions compatible with John's belief. Since the content is a set of propositions, $\cap CON(e)$ is a set of worlds, and since $CON(e)$ picks out the propositions believed by the experiencer in the case of *believe*, hoped propositions in the case of *hope* and so on, we can consider $\cap CON(e)$ to be equivalent to Hintikkan attitudinal alternatives.[45]

It seems to me that CON is quite parallel to thematic roles. Different kinds of eventualities are associated with different thematic roles: a state has an individual participants who is its experiencer, an event has an agent etc. Similarly, a contentful event is associated with a content. In this case, however, the thematic role is not assigned to an individual, but to a set of propositions. Also, the relation between $CON(e)$ and the clausal complement is not one of equality, unlike, e.g., $exp(e) = john$, but is more indirect, namely $\forall w' \in \cap CON(e).P(w')$.

There is an interesting difference between the classic Hintikkan semantics in (110b) and the corresponding event semantic formalization in (111): the event semantic representation contains an event description $belief(e, w)$ in addition to the world quantifier. What is the semantic contribution of this event description? With non-contentful events like *kick*, the event description makes a crucial semantic contribution: it states that what went on between the agent and the theme was kicking, not, e.g., hitting or kissing. Contentful events are a bit different, since they involve quantification over worlds compatible with the event. It is presumably the event description which makes it possible to infer that $\cap CON(e)$ maps to doxastic alternatives in the case of *believe* and bouletic alternatives in the case of *hope* etc. One way to go might be to see the event description as simply a partitioning of contentful events into subtypes such as belief events, hoping events, assertion events etc.[46] When we know which subtype of contentful events we are dealing with, we know which kinds of doxastic alternatives we can infer from it.

So far we have only discussed cognitive state predicates. But can we say that utterance predicates such as *say* also involve an eventuality with a content? Let us look at a concrete example:

[44] I am assuming here that thematic roles are functions, while Hacquard uses relations.

[45] The semantics of attitudes such as *hope* is actually slightly more complex, since they also involve an ordering source (Heim, 1992; von Fintel, 1999), but I am abstracting away from ordering sources in this section. For a treatment in this framework which includes ordering sources, see Hacquard (2006, p. 167-170).

[46] Thanks to Bart Geurts (p.c.) for this suggestion.

(112) John says that it is snowing

Hacquard proposes that the content of a saying event is the set consisting of the proposition expressed at that event. The content of (112) is simply the set consisting of the proposition *it is snowing*, and the modal base, the intersection of the content, is the worlds in which *it is snowing* is true.

In the event-based approach, the interpretation of the complement proposition is relativized to an event, not an individual. In earlier chapters, I have frequently used the notion of AH. Note that in a sense, there is no AH individual in the current framework, just an attitudinal event. However, attitudinal events are special in that they involve an individual who is conscious of the content of the event. This individual can be identified in the semantic representation by means of its thematic role: it is the experiencer of a mental state and the agent of an utterance event. It is possible to talk about the *AH* informally to refer to this individual. Contentful events involving an agent/experiencer arguably constitute only a subset of contentful events. It seems to me to be reasonable to analyze verbs such as *deserve* as a contentful state, but the participant of a deserving state, the *deserver*, does not need to be conscious of the state's content. I will return to the semantics of *deserve* in subsection 5.8.3.

5.2.3 Deal's account of context shift

Deal (2014) presents field work on embedded indexicals in Nez Perce. In this language, like (e.g.) Amharic and Zazaki (cf. section 2.8), indexicals embedded under attitude predicates can be shifted, as in the following example:

(113) *Sue hi-i-caa-qa* *['iin ⊘-k'oomay-ca-⊘]*
Sue 3SBJ-say-IPFV-REC.PST I 1SBJ-be.sick-IPFV-PRES

'Sue$_i$ said that she$_i$ was sick.' (Nez Perce; example, glosses and translation according to Deal, 2014, ex. (2))

The embedded subject is a first person pronoun, but picks up the subject of the speech predicate, not the external speaker. It can be shown through various tests that the embedded clause is not quotation. Other indexicals also shift in this language, but I will only be concerned with first person shift here.

A prominent approach to context shift uses context quantification along the lines of Schlenker (2003), cf. subsection 3.4.1 (see, e.g., Anand and Nevins, 2004; Shklovsky and Sudo, 2014). An account along such lines predicts obligatorily *de se* readings of shifted indexicals, a prediction which is not borne out in Nez Perce. This is Deal's motivation for proposing an analysis based on events and thematic roles, grounded in Hacquard's semantics of attitude reports (in particular the implementation of Anand and Hacquard, 2008).

Attitude predicates are predicates over events associated with an event description:

(114) $[[think]]^{C,a} = \lambda e.thinking(e)$ (cf. Deal, 2014, ex. (33))

Following Anand and Hacquard (2008), Deal assumes that the complementizer of the attitudinal complement has the semantics in (115):

(115) $[[C_{att}]]^{C,a} = \lambda P.\lambda e.\forall w' \in \cap CON(e).P(w')$ (cf. Deal, 2014, ex. (34))

The complementizer takes the complement proposition as its argument and turns the complement into a set of events e. The complementizer requires the complement proposition to hold in the intersection of $CON(e)$, i.e., the set of worlds compatible with e.

The idea of relegating the attitudinal semantics of complements to the complementizer was originally proposed by Kratzer (2006) and further developed by Moulton (2009). Deal borrows the event-semantic version of from Anand and Hacquard (2008). It is motivated by the fact that attitudinal verbs not only embed clauses, but also DPs:

(116) I believe this story. (Kratzer, 2006, ex. (2a))

Kratzer and Moulton argue that attitude verbs with DP complements do not involve quantification over worlds. If the denotation of the verb is the same when it takes a DP and a CP complement, the world quantification should have a different origin. This is solved in Kratzer and Moulton's work by letting the complementizer handle world quantification.

Finally, the attitudinal complements are associated with operators OP_{pers}, which shift values of the context parameter using the attitudinal event. The operator is syntactically represented in the left periphery of the attitudinal complement, and consequently only affects material within the complement:

(117) **Definition of Deal's (2014)** OP_{pers}
Where α is a branching node with daughters OP_{pers} and β such that β is a predicate of eventualities e, $[[\alpha]]^{C,a} = [[\beta]]^{C^{[EXT(e)\Rightarrow Speaker, GOAL(e)\Rightarrow addressee]},a}$ (Deal, 2014, ex. (35))

$EXT(e)$ picks out the agent/experiencer of an event e, and $GOAL(e)$ similarly picks out its goal. OP_{pers} shifts the speaker and addressee values of the context parameter to $EXT(e)$ and $GOAL(e)$ respectively.

Let us see how this operator affects the first person pronoun, which picks out the speaker value of the context parameter C:

(118) $[[I]]^{C,a} = Speaker(C)$

Normally, the speaker value of C will be the external speaker. However, if the pronoun occurs within the scope of the context-shifting operator, the speaker value of C is shifted to the agent/experiencer of an attitude verb e. Whenever that operator is present, a first person pronoun will therefore refer to the AH of the superordinate attitude predicate, not the external speaker. A central idea in the sections that follow is that perspective shift can be modelled event-semantically in a similar way.

5.3 A PCDRT account of perspective shift and perspective anaphora

5.3.1 Background

Here, I implement an event-based PCDRT account of perspective shift based in part on the work of Hacquard and Deal, and formalize the proposal that LDRs are anaphors with a presuppositional restriction to perspective holders. I first present my version of the event semantics of attitudinal complements and then turn to perspective shift and perspective anaphora. For ease of exposition I will not use real Latin examples here, but fake English examples where *SE* represents an LDR. Facts of Latin long-distance binding will be properly discussed in subsequent sections.

5.3.2 An event semantics for embedded indirect discourse in PCDRT

I will use (110a), repeated in (119), to exemplify my PCDRT implementation of Hacquard's semantics:

(119) John believes that it is snowing.

Some elements of the analysis are already known. I will review them quickly. (120) gives the abbreviated and full representations of the embedded proposition:

(120) a.

e_1
$snowing(e_1)$

b. $\lambda w.\lambda i.\lambda o.\partial(i[e_{i_1}]o) \wedge snowing(v(o)(e_{i_1}))(w)$

The verb *believe* itself only introduces an event description, cf. (121). Nominal arguments combine with the verbal event through thematic role assignments, as described in section 4.6.3.

(121) a. $[[believe]]^{M,a} = \lambda e.$

$belief(e)$

b. $\lambda e.\lambda w.\lambda i.\lambda o.\partial(i[]o) \wedge belief(v(o)(e))(w)$

The next step is to implement the event-relativization of the embedded proposition. In the abbreviated notation, I represent the relation between a contentful event e and a DRS K as a condition $content(e, K)$. The modal semantics of this condition is only apparent in the full notation:

(122) **Abbreviation for the event-relativizing condition:**
$content(e, K) = \lambda w.\lambda i.\forall w' \in \cap CON(v(i)(e)).\exists k.K(w')(i)(k)$

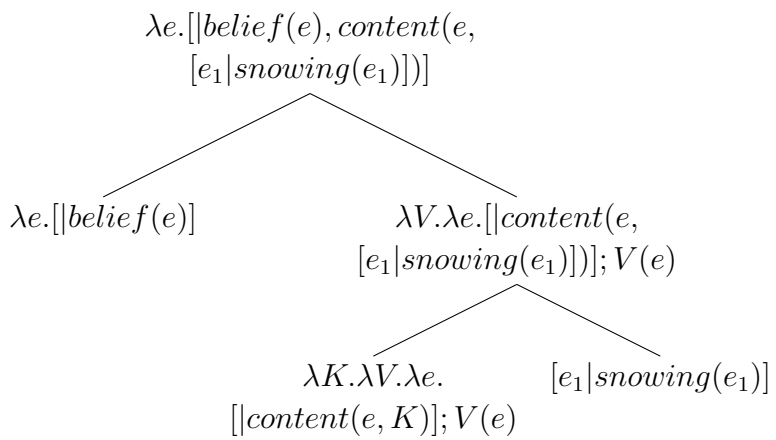
As is apparent from (122), the modal semantics follows Hacquard and Deal. But importantly, CON does not simply embed a proposition, but a DRS K. There is therefore an existential quantifier over states k within the scope of the world quantifier, and K is interpreted with respect to the input state, i and k in addition to w'. Since k extends the input state, discourse referents in i are also accessible in k, cf. subsection 4.4.2a.

Along with Anand and Hacquard (2008) and Deal (2014), I assume that world quantification is handled by the attitudinal complementizer. When the complementizer has combined with its complement, it should be of the right type to be able to combine with the verb, which is a predicate over events (and worlds, but I disregard them now, since they are not visible in the abbreviated notation). Note that Deal's complementizer in (115) turns the complement into a predicate over events too. Presumably, she assumes some special combinatory principle. I have not posited any special principle of that kind, so the complement needs to combine with the verb using functional application. I call the attitudinal complementizer C_{att}. K is a DRS and V is a variable over event predicates (I am leaving out states and worlds):

(123) $[[C_{att}]]^{M,a} = \lambda K.\lambda V.\lambda e.[|content(e, K)]; V(e)$

The complementizer introduces a *content* condition (cf. (122)) and relativizes the complement DRS, K, to an event variable e, which is abstracted over. The DRS with the *content* condition is sequenced with $V(e)$. When the verb is merged in, the result is a sequencing of the event description and the *content* relation:

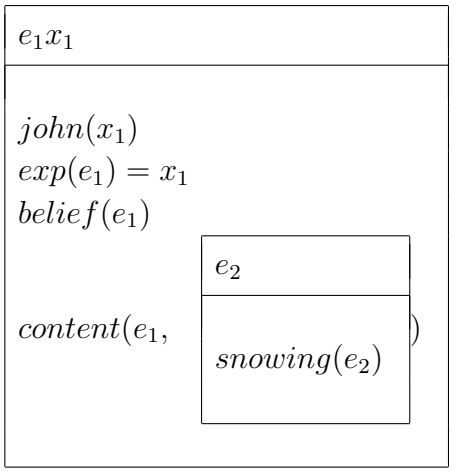
(124)



Because the complementizer contains a *content* relation, the complement clause can only combine with predicates over contentful events. Combining the complement clause with, e.g., $\lambda e.[|kicking(e)]$ might not lead to a type clash, but the result wouldn't be interpretable, because a kicking event is not compatible with *content*.

Adding the subject argument and existential closure (cf. subsection 4.6.3), the result is as in (125):

(125)



5.3.3 Context shift and perspective shift

The context-shifting phenomena that Deal (2014) treats share certain important properties with perspective shift in attitudinal complements. Her theory captures these properties, and I want my theory to capture them too. The first property is the individual to whom the interpretation is shifted. First person pronouns in Nez Perce can be shifted to the agent/experiencer of the attitudinal event. Deal derives this by updating the agent coordinate of the context parameter with the agent/experiencer of the variable of the contentful event. The interpretation of perspective sensitive items, e.g., *foreigner*, *to the left*, and LDRs, can be interpreted relative to the AH in attitudinal complements, cf. section 2.7, and as I argued in subsection 5.2.2, the AH can be reinterpreted as the agent/experiencer of an attitudinal event. In a way similar to Deal, I will use the locally represented variable for the attitudinal event to represent perspective shift.

A second feature that perspective shift shares with context shift in attitudinal environments is its scope: shifting takes place within the attitudinal complement, but not outside of it. In Deal's analysis, this is taken care of by the location of the context-shifting operator in the left periphery of the attitudinal complement. It is crucial that my theory makes the same scope predictions.

There are a number of differences, both with respect to data and theory, which prevent me from simply adopting Deal's theory as it is. For example, LDRs and perspective-sensitive items in general are not indexicals, cf. section 2.8, so a perspective-shifting account should not include an operator manipulating the context parameter. Also, my analysis is framed in a dynamic framework where LDRs are anaphors. Deal works in a static semantics, and shifted indexicals are bound by the context parameter in her analysis.

5.3.4 Modelling perspective shift and perspective anaphora: Two failed attempts

If LDRs are anaphors with a presuppositional restriction to perspective holders, they have semantic similarities with a number of pronoun types, such as personal pronouns

with gender features, like *he*. *He* is an anaphor with a presuppositional restriction to male individuals. In this subsection, I present two analyses which make LDRs strictly parallel to pronouns like *he*: they contain a presupposition that the antecedent has some specific property. As we will see, these approaches to LDRs fail, but I think they fail for interesting reasons. I will therefore work out the proposals in some detail before moving on to a more appropriate account.

The anaphor *he* can be represented as in (126) (=(83a)) (cf. subsection 4.4.4):

(126) $[[he]]^{M,a} = \lambda P.$ $\begin{array}{|l|}\hline \overline{x}_1 \\ \hline \partial(male(x_1)) \\ \\ \hline \end{array}$ $; P(x_1)$

This pronoun introduces an anaphoric discourse referent x_1 and the presuppositional condition that the individual assigned to x_1 should be male. Let us assume that the LDR has a presuppositional condition strictly parallel to that of *he*, which restricts its possible resolutions to perspective holders.

If LDRs are anaphors oriented towards the persective holder, and the perspective holder of attitudinal complements is the agent/experiencer of the attitudinal event, we could imagine that LDRs have a presuppositional restriction to the agent/experiencer of an accessible contentful event. I will work out the basics of such a proposal to see what predictions follow.

On such an account, the denotation of the LDR might look as in (127). $cp(e)$, the *conscious participant* of e, is a function which maps events e to the agent/experiencer of e.[47]

(127) **Denotation of the LDR (first try):**

$[[se]]^{M,a} = \lambda P.$ $\begin{array}{|l|}\hline \overline{e}_1\overline{x}_1 \\ \hline \partial(cp(e_1) = x_1) \\ \\ \hline \end{array}$ $; P(x_1)$

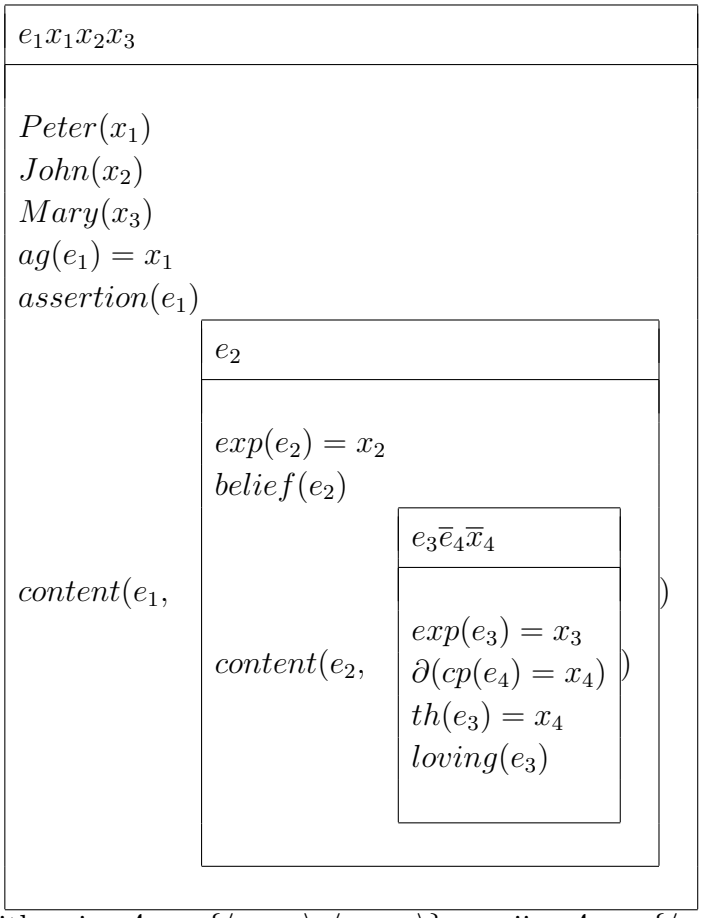
As for *he* above, the LDR is a generalized quantifier, introducing an anaphoric individual discourse referent x_1. In addition to that, an anaphoric event discourse referent e_1 is also introduced, and there is a presuppositional restriction stating that x_1 is the *cp* of e_1. In other words, when the LDR is sequenced in a complete DRS, it will have to be resolved to the agent or experiencer of an accessible event. Let us see how this works in practice. In (128), an LDR is embedded under two attitude predicates with different subjects. The prediction should be that the LDR can be resolved to either of the superordinate subjects, but not to any other discourse referent:

[47] *cp* is equivalent to Deal's *EXT*. *EXT* presumably stands for 'external argument', a concept which is not suitable under the assumptions of the present work.

(128) Peter$_i$ says that John$_j$ believes that Mary loves SE$_{i/j}$.

(129) is the DRS for (128) given a denotation for the LDR as in (127):[48]

(129)



Either i: $\mathcal{A} = \{\langle e_4, e_1\rangle, \langle x_4, x_1\rangle\}$, or ii: $\mathcal{A} = \{\langle e_4, e_2\rangle, \langle x_4, x_2\rangle\}$, or iii: $\mathcal{A} = \{\langle e_4, e_3\rangle, \langle x_4, x_3\rangle\}$

e_1 is an assertion event with Peter as agent, and embeds a new DRS as its attitudinal complement. This complement contains a belief event e_2 of John, which in turn embeds a complement with an LDR x_4. The LDR also introduces an anaphoric event e_4 and has the presuppositional condition the x_4 is the *cp* of e_4. The resolution of the LDR is given by the $\mathcal{A}$-function. There are three possibilities: according to resolution *i*, e_4 is resolved to the matrix assertion event e_1. According to the presuppositional restriction of the LDR, x_4 must be resolved to x_1 as x_1 is the *cp* of e_1. On resolution *ii*, e_4 is resolved to the embedded belief event e_2, and accordingly, x_4 is resolved to x_2. Both *i* and *ii* are wanted predictions. However, there is also an unwanted prediction that e_4 is resolved to the local loving event e_3 and that x_4 is resolved accordingly to x_3.[49] We could rule this option out by imposing further presuppositional restrictions. For example, we might require the LDR to be the *cp* of a contentful event. But assume we were to make a DRS for the following sentence:

[48]For simplicity, I assume here and in the rest of this dissertation that the discourse referents of individuals referred to by proper names always take the highest possible scope in DRSs.

[49]Remember that I am disregarding the local binding of the reflexive, cf. section 2.6.

(130) Mary$_i$ said that she was happy, and John$_j$ thought that Bill loved SE$_{j/*i}$.

In a case like this, there would be two contentful events accessible to the anaphor: both a saying event with Mary as agent and a believing event with John as experiencer. Both would have a *cp*, so we predict that the LDR could be resolved either to Mary or to John, contrary to fact. LDRs can pick up the agent/experiencers of contentful events in whose complements they occur, but not other agents/experiencers of other accessible contentful events. In other words, a theory like this does not get the scope facts right.

It might be possible to argue for a stricter kind of accessibility which derives the correct pattern, or alternatively, more elaborate presuppositions in the denotation of the LDR. Nevertheless, I think this is not a fruitful way of approaching the problem, first and foremost because it does not really make sense of the notion of perspective shift. As we saw in section 2.7, the antecedent of perspective sensitive items is by default the speaker, but it can be shifted to some other individual in a number of linguistic environments. An LDR is not an anaphor picking up the agent/experiencer of a contentful event, but an anaphor picking up a perspective holder. In a certain environment, namely indirect discourse, the agent/experiencer of a contentful event is a perspective holder. In other words, an account like this does not make sense of perspective shift. As a consequence, a separate denotation for the LDR (and other perspective-sensitive items) would be needed for non-attitudinal cases of perspective shift.

Let us try a second attempt which preserves the idea that LDRs have a presuppositional restriction analogous to *he*, but where the account of the anaphor is paired with an account of perspective shift. In this approach, the denotation of the LDR is as follows:[50]

(131) **Denotation of the LDR (second try):**

$$[[se]]^{M,a} = \lambda P. \begin{array}{|l|}\hline \overline{x}_1 \\ \hline \partial(PHolder(x_1)) \\ \\ \hline \end{array} ; P(x_1)$$

The LDR has a presuppositional condition parallel to that of *he*, which restricts its possible resolutions to individuals associated with the predicate $PHolder$.

The task now is to use the event semantics built up in the previous section to make sense of a restriction like this. In Deal's approach, context shift was analyzed by means of an operator in the left periphery of the embedded CP. An operator of that kind would be difficult to introduce given my assumptions for type reasons. Instead, I propose that the attitudinal complementizer takes care of the shifting. A first version of the perspective-shifting attitudinal complementizer, $C_{p-shift}$, is given below:

[50]For the moment, I leave out how perspective is assigned to the first person by default, and how LDRs fail to refer to first person perspective holders. I will return to these issues below.

(132) **Denotation of $C_{p-shift}$ (first try):**

$$[[C_{p-shift}]]^{M,a} = \lambda K.\lambda V.\lambda e.$$

$content(e, ($ $PHolder(\imath x.cp(e) = x)$ $; K))$ $; V(e)$

(132) has one addition to the denotation of the attitudinal complementizer in (123): the condition $PHolder(\imath x.cp(e) = x)$ is added to the complement proposition. The condition says that the $PHolder$ condition is assigned to the $cp(e)$.[51] We can represent the sentence in (128) as follows:

(133)

$e_1 x_1 x_2 x_3$
$Peter(x_1)$ $John(x_2)$ $Mary(x_3)$ $ag(e_1) = x_1$ $assertion(e_1)$ $content(e_1,$

e_2
$PHolder(\imath x.cp(e_1) = x)$ $exp(e_2) = x_2$ $belief(e_2)$ $content(e_2,$

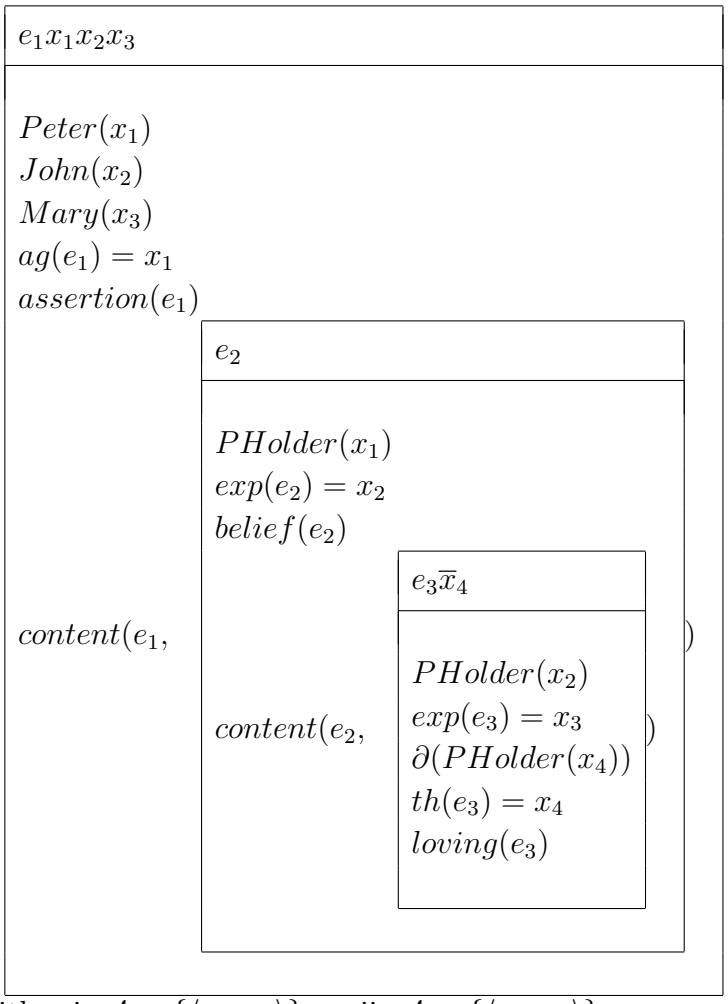
$e_3 \overline{x}_4$
$PHolder(\imath x.cp(e_2) = x)$ $exp(e_3) = x_3$ $\partial(PHolder(x_4))$ $th(e_3) = x_4$ $loving(e_3)$

The $PHolder$ condition is associated with the cp of the attitudinal event e_1 inside the first attitudinal complement and with the cp of e_2 inside the second. The anaphoric discourse referent x_4 has a presuppositional condition that it should be resolved to an antecedent associated with $PHolder$.

[51] See (277k) in appendix A.1 for the semantics of the iota operator.

The agent of e_1 is x_1, so we can replace $\iota x.cp(e_1) = x$ with x_1. Similarly, we can replace $\iota x.cp(e_2) = x$ with x_2 There are two possible antecedents for the anaphor x_4, namely x_1 and x_2, the two $PHolder$s of this sentence, which is indeed the prediction we want.

(134)



Either i: $\mathcal{A} = \{\langle x_4, x_1\rangle\}$, or ii: $\mathcal{A} = \{\langle x_4, x_2\rangle\}$

This account, unlike the previous one, includes a perspective-shifting operator. There are, however, a number of problems here too. First, it does not capture the scope facts as intended: the problem is that $PHolder$ is construed as a property that holds of the inhabitant of x_1. Even though $PHolder$ is assigned to x_1 inside of the complement, there is nothing which rules out that it also holds outside of the report. Obviously, it is not the case that if a proposition P occurs within an attitudinal complement, $\neg P$ must be true outside of the complement.

Second, it is far from clear what kind of property $PHolder$ should be. I introduced it first as a presuppositional restriction to the LDR in (131), on analogy with the restriction to males for *he*. For males, there is no problem: the property *male* singles out a group of individuals (given some world), namely all the men and boys. It is far from clear that $PHolder$ singles out a set of individuals in the same way.

It could be objected that what I did wrong was to construe perspective-holding as a property. Perhaps it rather is a relation between an individual and the event described in the report. In that case, it is not obvious how we would be able to derive the antecedence

ambiguity for LDRs in deeply embedded attitudinal complements, since presumably only one individual is the *PHolder* of the reported event in which the LDR occurs. But there is also a more conceptual problem: if *PHolder* is a relation between an individual and an event, it should be concerned with real-life individuals and events and how they are related to each other. It seems to me that perspective-holding is more about language than about the world. As I will try to make more explicit in the following section, perspective-holding is concerned with what point of view the (external) speaker adopts in talking about a state of affairs she is speaking about, not about how certain individuals relate to certain events in the world. In other words, perspective itself is not part of truth-conditional semantics. However, it has an affect on truth-conditional semantics in that perspective-sensitive items are obligatorily oriented towards perspective-holders.

This problem with perspective conditions has also been observed in previous DRT work on perspective. As we saw in subsection 3.4.5, Sells (1987) uses somewhat non-standard DRSs, where discourse roles are assigned in a field above the universe. Although he does not comment on it or provide an interpretation of those structures, it is reasonable to assume that this practice is chosen to prevent the assignment of discourse roles from ending up in the truth-conditional content of the clause. Stirling (1993, p. 283-284) discusses similar problems with respect to the condition $validator(x)$ that she uses in her theory of long-distance binding. She proposes that it is a special kind of formal condition.

Before returning to the implementation of perspective shift, it may be useful to reflect a bit on what this phenomenon is and what role it plays in truth-conditional semantics.

5.3.5 Interlude: Perspective and truth-conditional semantics

Why does perspective shift take place in certain environments? Two early works on perspective which address this question are those of Kuno and Kaburaki (1977) and Sells (1987).

Sells' theory was summarized in subsection 3.4.5. As I explained there, he proposed three discourse roles: the *Source*, i.e., the agent of the communicative act; the *Self*, the individual whose mental content the discourse represents; and the *Pivot*, the individual from whose spatio-temporal point of view deictic expressions are evaluated. In default cases, all three are associated with the (external) speaker, but in some cases, some of these roles can be assigned to discourse-internal participants.

The interesting question for us here is why the perspective is shifted from the external speaker to discourse-internal participants in these cases. Sells says the following about that:

> The idea is that someone outside the sentence (the external speaker) will in some way "take the part" of someone in the sentence, the *internal protagonist*, as I will call it. If the speaker identifies with the communicating being of the internal protagonist, then the SOURCE is internal. As there is no communication in the linguistic sense without consciousness, it follows that the SELF must be internal too. Similarly, as the mind is within the body, one cannot represent someone else's mental "point of view" without adopting that person's

> physical aspect too; hence, internal LF implies internal PIVOT. (Sells, 1987, p. 456)

Perspective shift happens, in other words, because the external speaker identifies with a discourse-internal participant. In complements to utterance verbs, where all roles are shifted, the external speaker identifies with the discourse-internal speaker, and acts as if she were in possession of that internal protagonist's mental life and spatio-temporal location.

Kuno and Kaburaki (1977) and Kuno (1987) posit a similar identification of the external speaker with a discourse-internal participant, which they call *empathy*, a term borrowed from literary studies. To Kuno and Kaburaki, perspective has to do with the angle from which a speaker describes a state of affairs, as seen in subsection 3.4.3. To Kuno and Kaburaki, as to Sells, perspective is in some sense about the speaker's identification with a discourse-internal participant.

The ability to adopt other people's perspective has been subject to neuro-linguistic research in recent years. One aspect of perspective-taking is called *mentalizing*, i.e., our ability to make inferences about the mental states of other individuals, such as beliefs and emotions. In describing mentalizing, I draw on Frith and Frith (2006), who provide a literature review of research on the phenomenon. An important part of mentalizing consists of making inferences about the mental life of others from our own mental experiences. When we observe someone experiencing an emotion, there is activity in the same areas of the brain as when we feel that emotion ourselves. This is called the brain's *mirror system*. However, there is more to mentalizing than mirroring: our own mental life is insufficient to capture the causes of those mental states (Frith and Frith, 2006, p. 531). To do that, we need to adopt the other's perspective, to see the world from the other person's point of view. According to Frith and Frith, this has to be understood in a rather physical sense: an important source of our beliefs and emotions is our visual experience, and in order to make inferences about another person's mental states, we often need to adopt their physical point of view and see the world through their eyes. In that way we can, e.g., understand false beliefs, as in the example Frith and Frith give: "He thinks he is safe, because he can't see the bear coming up behind him" (Frith and Frith, 2006, p. 532). A region of the brain which is linked to eye-movement observation and representation of the world from different spatial points of view has been shown to be involved in mentalizing (Frith and Frith, 2006, p. 531-532).

I conjecture that cognitive perspectival processes such as mentalizing are at the origin of perspective-shifting phenomena. Since indirect discourse gives the content of mental states of individuals, it is a particularly salient environment for such processes. It is probably not true, however, that there is a one-to-one relation between such cognitive processes and the linguistic phenomenon of perspective shift. Perspective shift is part of the grammar of languages and is as such conventionalized and subject to cross-linguistic variation.

The important point here, however, is that speaker identification with a discourse protagonist is not itself part of the truth conditions of a sentence. The placement of the camera does not change the content of the story, to borrow Kuno and Kaburaki's metaphor. But perspective-taking has a truth-conditional effect in certain environments,

as it determines the reference point for perspectival expressions and the antecedents of LDRs. The formal system must be formulated in such a way that this truth-conditional effect is accounted for without making perspective itself truth-conditional.

5.3.6 Modeling perspective shift and perspective anaphora: Labeled registers

Perspective shift and anaphora

In subsection 5.3.4, I tentatively suggested that the presuppositional restriction of LDRs was similar to the restriction to male individuals for *he*. We can now conclude the parallel is not so good after all: LDRs are restricted to perspective holders, but being a perspective holder is not a part of truth-conditional semantics, as we have just seen.

What we want is a way of formulating in the LDR denotation a presuppositional restriction to perspective holders which is not a presupposition that a real-life individual has some property. I will propose that certain individuals in the discourse are singled out formally as being perspective holders, and perspectival anaphors pick antecedents with this formal marking. As we have seen, PCDRT has a type distinction between registers and individuals. Individuals are real-life entities, but registers are formal entities in language. This distinction can be exploited to model the formal marking. In the DRSs I have presented above, conditions apply to the individuals or events assigned to registers, but nothing prevents us from having conditions that apply to registers.[52] In that way, a discourse referent can be formally marked without predicating anything of the individual assigned to that discourse referent.

I propose that $PHolder$ is a condition that applies to registers. LDRs are anaphors which require their antecedent to have a $PHolder$ marking. (135) is an attempt at representing this:

(135) **Denotation of the LDR (third try):**

a. **Abbreviated representation:**

$[[\text{se}]]^{M,a} = \lambda P.$ $\begin{array}{|l|}\hline \overline{x}_1 \\ \hline \partial(PHolder_{reg}(\mathcal{A}(x_1))) \\ \hline \end{array}$ $; P(x_1)$

b. **Full representation:**
$\lambda P.\lambda w.\lambda i.\lambda o.\partial(i[x_{i_1}]o) \wedge ant(o)(x_{i_1}) \wedge \partial(PHolder(o)(\mathcal{A}(o)(x_1))) \wedge P(x_{i_1})(w)(i)(o)$

Se has a presuppositional condition which states that $PHolder$ holds of $\mathcal{A}(o)(x_{i_1})$, that is, the register picked out by the anaphora resolution function $\mathcal{A}$. Crucially, the v function, which assigns inhabitants to registers (cf. subsection 4.4.2), is not involved in this

[52] The interpretation of *ant* given in (84) does already involve a condition which applies to registers irrespective of the individuals assigned to them, namely $\mathcal{A}(s)(x) < x$.

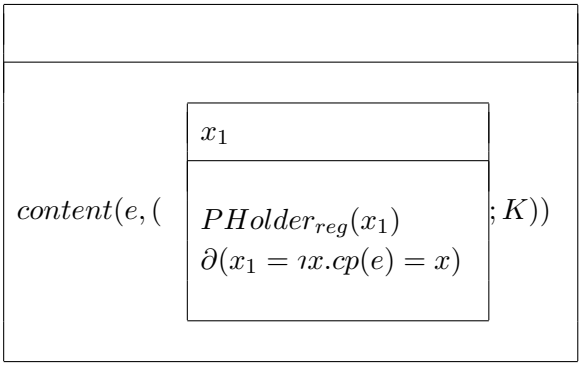
condition, so nothing is predicated of the individual assigned to $\mathcal{A}(o)(x_{i_1})$.[53] Register conditions are distinguished from normal conditions by the subscript *reg* in the abbreviated notation. One way of viewing register conditions is as a kind of label on discourse referents which singles them out without affecting the individuals assigned to them.[54]

Above, I proposed that the attitudinal complementizer acts as a perspective shifter. I will maintain that assumption. The denotation of the perspective-shifting complementizer in (132) needs to be modified, however.

(136)

a. **Denotation of $C_{p-shift}$ (final try):**

$$[[C_{p-shift}]]^{M,a} = \lambda K.\lambda V.\lambda e.$$



b. **The *content* condition in full PCDRT notation**
$content(e, K) = \lambda w.\lambda i.\forall w' \in \cap CON(v(i)(e)).\exists k.\partial(i(x_{i_1})k) \wedge PHolder(k)(x_{i_1})$
$\wedge\, \partial(v(k)(x_{i_1}) = \imath x.cp(v(k)(e)) = x) \wedge K(w')(i)(k)$

(136a) is the denotation in abbreviated notation of the perspective-shifting attitudinal complementizer. In (136b) I have given the full representation of the *content* relation. The complementizer adds a discourse referent x_1 to the complement and associates two conditions with x_1. The first is $PHolder_{reg}$, which labels x_1 as a perspectival register. The second condition ensures that x_1 is inhabited by the *cp* of the attitudinal event. This condition is presuppositional: it should not end up as part of the content of the *cp*'s attitude, and it should be preserved under negation.[55]

To illustrate how this works, I will analyze two test cases. Note, however, that this illustration is incomplete: so far, I have only introduced shifted perspective holders, not non-shifted ones, which I will return to below.

Test case 1: Deeply embedded indirect discourse

The first case I will attempt to analyze is a sentence where an LDR is embedded under two attitude predicates. (137b) is a DRS for (128), repeated in (137a), where a belief

[53] *PHolder* also takes the output state as an argument in the full notation: The PCDRT equivalent of a discourse referent is not strictly speaking a register, but a register at a state. A register x_1 can be inhabited by different individuals at different states, cf. subsection 4.4.2.

[54] This is reminiscent of, and in part inspired by, Layered DRT (LDRT; Geurts and Maier, 2003), where discourse referents which are rigid, presupposed, implicated etc. are distinguished in the DRS by means of dedicated labels. LDRT is more complex than the present framework, however, and this should not be seen as a full-fledged alternative to LDRT.

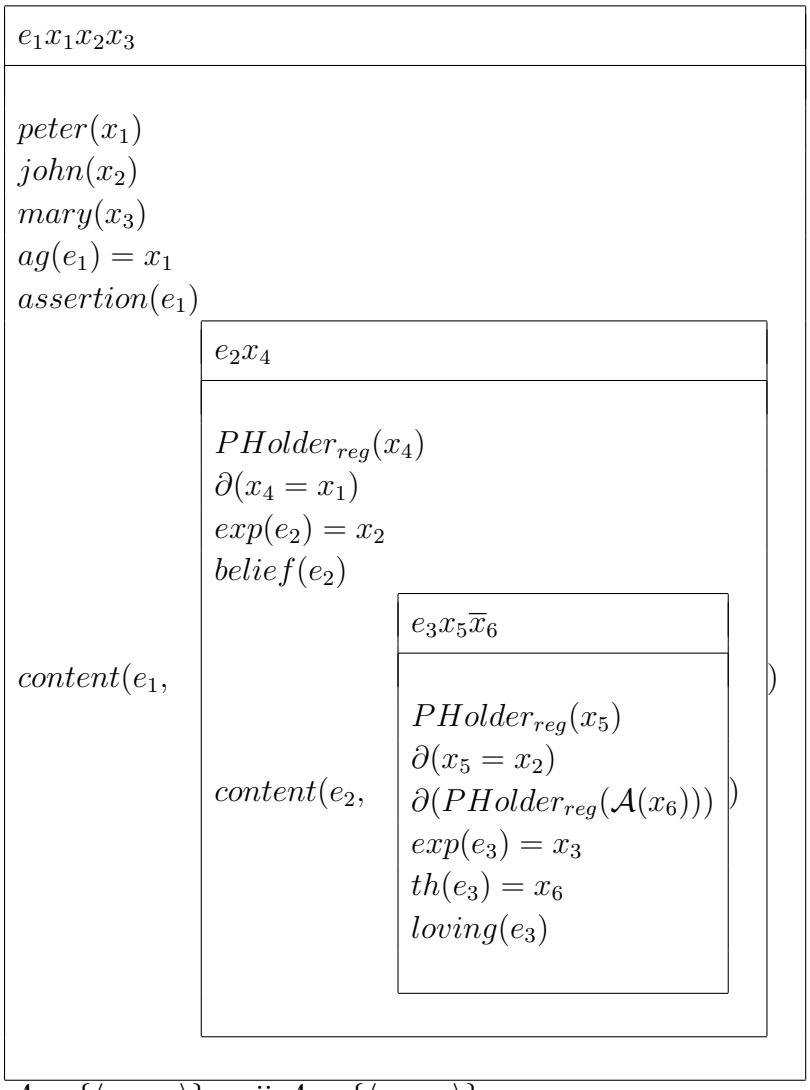
[55] I assume trans-world identity here. It might be possible to replace the equality relation in the iota expression with a world-bound counterpart relation (cf. Lewis, 1968), if desired.

report is embedded within an utterance report, and the lowest report contains an LDR:

(137)

a. Peter$_i$ says that John$_j$ believes that Mary loves SE$_{i/j}$.

b.



i: $\mathcal{A} = \{\langle x_6, x_5\rangle\}$ or ii:$\mathcal{A} = \{\langle x_6, x_4\rangle\}$

The complementizer of the complement to *says* introduces the register x_4, and the complementizer of *believes* introduces x_5 in the manner explained above. Both are marked as perspectival, because they are associated with $PHolder_{reg}$. The scope of the perspective-shifting register is given by the standard constraints on accessibility, cf. subsection 4.3.2 and subsection 4.4.4. Since x_5 is in the universe of the complement of the belief verb, it is only accessible there. x_4 is accessible from the belief complement too, because the universe of the saying complement is within the accessibility path. The reference of x_5 and x_4 is guaranteed by the equality conditions. x_5 is equal to x_2, the $cp(e_2)$, and x_4 is equal to x_1, the $cp(e_1)$. The anaphoric register of the LDR, x_6, has a presuppositional requirement that the antecedent register should be associated with $PHolder_{reg}$. There are two candidates in the accessibility path, x_5 and x_4, and $\mathcal{A}$ can therefore map x_6 to either one. Given the equality conditions, this amounts to the LDR taking either Peter or John as its antecedent, which is the result we want. Since $PHolder_{reg}$ applies only to

registers, it is not interpreted as a predicate over individuals, and therefore does not have any truth-conditional effect apart from marking antecedents.

In subsection 3.4.4, I discussed the approach to long-distance reflexivity of Sundaresan (2012), who argues that LDRs are structurally bound by a clause-local covert perspective pronoun. When an LDR in deeply embedded indirect discourse refers to the subject of a higher attitude predicate, she must assume that the perspective of the clause containing the LDR is shifted to a non-local AH. I showed that approaches of that kind make an untenable semantic prediction, on the assumption that the perspective-operator is also responsible for the attitudinal semantics: in an example like (137a), we would be forced to conclude that the proposition *Mary loves SE* could somehow be relativized to Peter, even though it is embedded under a belief verb with John as subject. If the assumption of a connection between perspective shift and interpretation is lifted, on the other hand, the covert pronoun seems like a mere *ad hoc* mechanism to save local binding.

Note how the current approach differs from Sundaresan's: The perspective of the clause containing the LDR is the agent/experiencer of the local attitude predicate, regardless of which antecedent the LDR picks up. The ambiguity of the LDR is instead accounted for in terms of the recursivity of perspective shift. In this way, the unwanted predictions of Sundaresan's approach are avoided without positing *ad hoc* mechanisms, as the recursivity of perspective shift matches the recursivity of interpretation. The assumption that reflexive binding is always local is not maintained, but it seems to me that the ambiguity in cases like (137a) militates against such an assumption. If long-distance binding were local, it shouldn't be possible for the binding mechanism to cross potential antecedents in deeply embedded indirect discourse.

Test case 2: Coordinated attitude reports

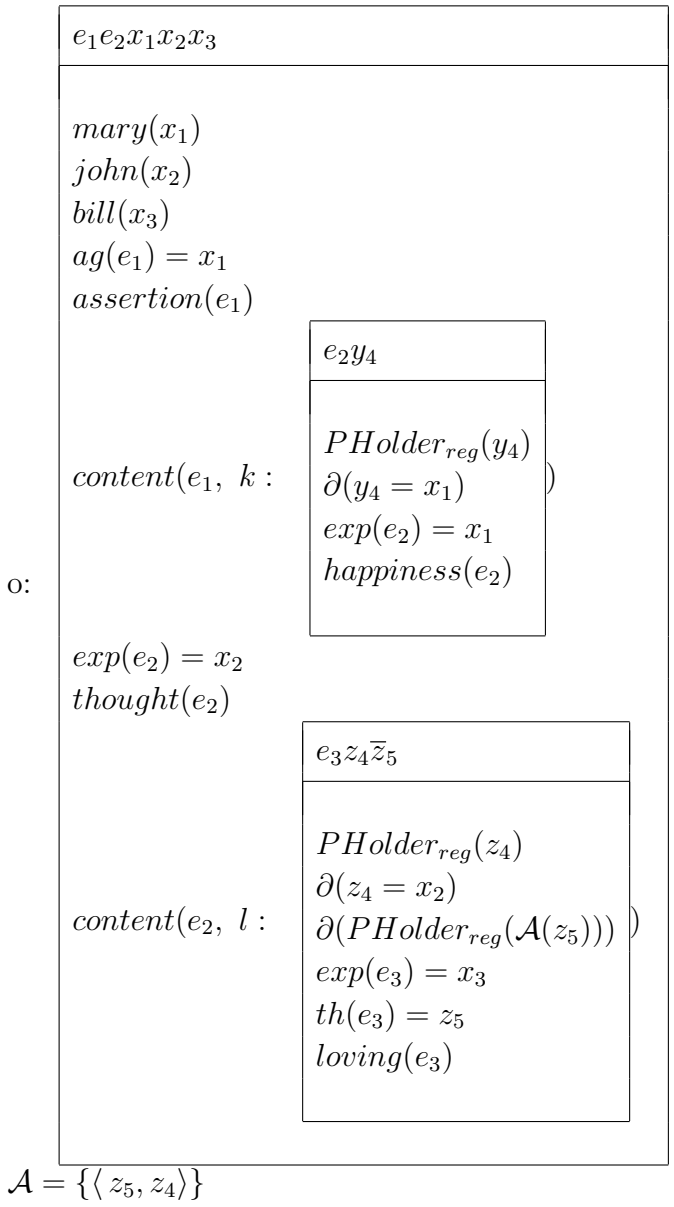
In subsection 5.3.4 I sketched two accounts of long-distance binding which failed to accurately capture the antecedence restrictions in examples such as (138) (=(130)), where two attitude reports are coordinated. As a second test case, we will look at how the current theory captures these restrictions. To recapitulate, the LDR in (138) should be able to refer back to *John*, the AH of the embedding thought predicate, but not *Mary*, the agent of the utterance predicate in the first conjunct.

(138) Mary$_i$ said that she was happy, and John$_j$ thought that Bill loved SE$_{j/*i}$.

In the current approach, this anaphoric pattern is straightforwardly captured: the two attitude verbs *said* and *thought* embed separate DRSs, with a distinct *PHolder* discourse referent in each. The *PHolder* register in the first embedded DRS will not be accessible to the LDR embedded in the second. The abbreviations defined in section 4.5 are not sufficiently fine-grained to clearly show this, however, as discourse referents in different DRSs will have indistinguishable names. In the DRS in (139) I have therefore chosen to have distinct names for individual DRSs: individual DRSs in the universe of the matrix DRS start with x, in the first embedded DRS they start with y, and in the third DRS they start with z. The numbering of the discourse referents will be relative to the matrix

state in both subordinate DRSs as usual. Event discourse referents are not renamed. A letter indicating the output state is added in front of each DRS:[56]

(139) o:



Mary's saying event embeds a DRS k, and in that DRS, a perspective-shifting discourse referent y_4 is introduced, which is inhabited by Mary. John's thought event embeds a DRS l containing a perspective-shifting discourse referent z_4, inhabited by John. l also contains the anaphoric discourse referent of the LDR, z_5. z_5 must be resolved to a perspective-holding discourse referent. Only the local perspective holder in l, z_4, is accessible. Since the state k does not update the universe of the matrix DRS, y_4 is not within the accessibility path of the anaphor in l. Consequently, z_5 can only be resolved to z_4, which means that the LDR can only refer to John, the experiencer of the thought event.

[56]In order not to make the DRS to complex, I have disregarded the anaphoricity of *she* in the first conjunct.

LDRs and other pronouns

The approach argued for here does not prevent other anaphoric pronouns from picking up the perspective holder. A pronoun with no presuppositional restriction to perspective holders can still pick up the agent/experiencer of a contentful event as antecedent, if a discourse referent with that reference is within the accessibility path of the pronoun. This is a welcome result in light of the Latin data, as LDRs are not in complementary distribution with other anaphors, as shown in subsection 2.4.3.

Ruling out first and second person antecedents

As explained in section 2.7, the perspective is by default assigned to the speaker. However, LDRs in Latin can only pick up shifted perspective holders which are not assigned to the speaker. It is reasonable to attribute this to the fact that reflexive pronouns have third person features. Here I will add a account of indexicality to show how to model the default first person orientation of perspective, as well as the semantic effect of the third person feature on the LDR.

I follow the standard Kaplanian assumption that every expression is interpreted relative to a context parameter c, which is a tuple of a contextual agent c_A, an addressee c_{addr} and a world c_w (I am leaving out time, location and possibly other contextual coordinates). I stipulate a mechanism that adds a discourse referent for the contextual agent as the first individual discourse referent of every matrix DRS, as seen in (140). Since the condition $x_1 = c_A$ presumably isn't part of the asserted content of the sentence, this equality condition is preceded by the partial operator. The contextual agent's register is also given the label FP_{reg} (for *first person*):[57]

(140) $[[\text{It is raining}]]^{M,c,a} =$

$e_1 x_1$
$\partial(x_1 = c_A)$ $FP_{reg}(x_1)$ $raining(e_1)$

Next, we need a way for the first person pronoun to obligatorily pick up the discourse referent for the contextual agent. I propose to treat it as an anaphor containing a presupposition that the antecedent register is associated with FP_{reg}:

(141) $[[\text{I}]]^{M,c,a} = \lambda P.$

$\overline{x}_1$
$\partial(FP_{reg}(\mathcal{A}(x_1)))$

$;P(x_1)$

[57] This account is a simplification with the necessary ingredients to model the first (and second) person blocking of LDRs. It is not to be taken as a sophisticated account of indexicality. For proper DRT accounts of indexicals, see, e.g., Zeevat (1999), Maier (2009b) or Hunter (2010).

This first person anaphor can only be resolved to the discourse referent representing the contextual agent, since only that discourse referent is labeled with FP_{reg}:

(142) [[I sing to Mary]]^{M,c,a} =

$e_1 x_1 \overline{x}_2 x_3$
$\partial(x_1 = c_A)$ $FP_{reg}(x_1)$ $\partial(FP_{reg}(\mathcal{A}(x_2)))$ $mary(x_3)$ $ag(e_1) = x_2$ $goal(e_1) = x_3$ $singing(e_1)$

$\mathcal{A} = \{\langle x_2, x_1 \rangle\}$

Other indexicals can be added in the same way. For example, the addressee can be represented by a discourse referent in the matrix DRS associated with the condition $\partial(x_2 = c_{addr})$ and the label SP_{reg} (second person).

Now that we have a basic semantics for context dependent expressions, we can account formally for the fact that the contextual agent is the default perspective holder. The discourse referent in the matrix DRS representing the contextual agent is not only labeled FP_{reg}, but also $PHolder_{reg}$:

(143) [[It is raining]]^{M,c,a} =

$e_1 x_1$
$\partial(x_1 = c_A)$ $FP_{reg}(x_1)$ $PHolder_{reg}(x_1)$ $raining(e_1)$

Now, the external speaker will be accessible to all perspective-sensitive items in a sentence. It remains to be explained why the Latin LDR, as well as LDRs in many other languages, cannot refer to the contextual agent. Let me illustrate what is not possible. The stars mean that the sentences are ungrammatical with the given coreference markers.

(144)

a. *Mary loves SE$_{me/you}$.

b. *John believes that Mary loves SE$_{me/you}$.

c. *I/You$_i$ believe that Mary loves SE$_i$.

As (144a) shows, a Latin-type LDR cannot be used in non-shifting environments to refer to the current speaker (or, for that matter, the current addressee). Embedding it under a

perspective-shifting operator, as in (144b), does not make an utterance context antecedent any more available. Finally, if an attitude has a first or second person agent/experiencer, as in (144c), an LDR cannot be used to refer back to it, unlike when the agent/experiencer is a third person. In all these cases, a personal pronoun is used instead.

This behavior is expected, as the Latin reflexive is obligatorily third person. We therefore need a semantics for the third person which rules out first and second person antecedents. There are two possibilities I can envision: either LDRs should not take antecedents labeled with FP_{reg} or SP_{reg}, or LDRs should not be inhabited by contextual participants, that is, C_As or C_{add}s (the latter solution is chosen in Schlenker, 2003, sect. 6.1.1.). In the current setup, the first solution would not immediately predict ungrammaticality in cases such as (144c): as we have seen, the context-shifting complementizer introduces a new register. In (144c), that register would be inhabited by the contextual agent or addressee, but as the theory stands, it would not bear FP_{reg} or SP_{reg} labels. It might be possible to add an agreement mechanism. Instead of doing that, I opt for the second solution: third person features introduce a presuppositional ban against a resolution to contextual participants. The updated denotation for the LDR is as follows:

(145) **Denotation of the LDR (final version):**

a. **Abbreviated representation:**

$$[[\text{se}]]^{M,c,a} = \lambda P. \begin{array}{|l|}\hline \overline{x}_1 \\ \hline \partial(PHolder_{reg}(\mathcal{A}(x_1))) \\ \partial(\neg UttPart(x_1)) \\ \hline \end{array} ; P(x_1)$$

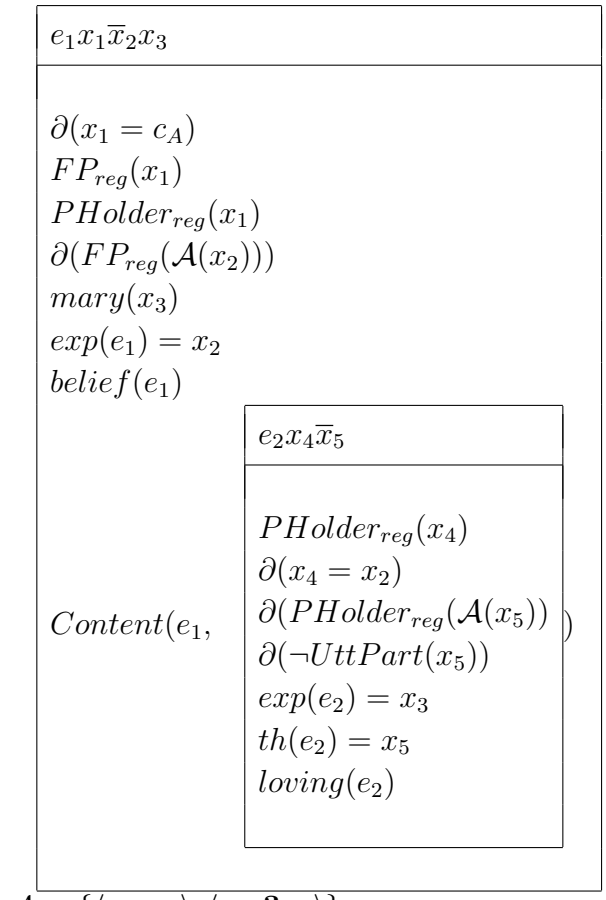
b. **Full representation:**
$\lambda P.\lambda w.\lambda i.\lambda o.\partial(i[x_{i_1}]o) \wedge ant(o)(x_{i_1}) \wedge \partial(PHolder(\mathcal{A}(o)(x_1)) \wedge \neg(v(o)(x_{i_1}) = c_A \vee v(o)(x_{i_1}) = c_{addr})) \wedge P(x_{i_1})(w)(i)(o)$

In the abbreviated notation, $\neg UttPart$ is added to the presuppositional conditions of the anaphor. The semantic interpretation of this condition is only apparent in the full notation: the individual assigned to the anaphoric register should not be the agent or addressee of the context.[58]

Let me now spell out how this blocks long-distance binding in examples like (144c) (which I deem to be the most complex and interesting case). I choose the version with a first person matrix subject:

[58] In cases where contextual agents choose to portray themselves in the third person for stylistic reasons, LDRs can in some sense refer back to the contextual agent in Latin, in the same way that other third person pronouns can. There is ample evidence for this from Caesar's *De Bello Gallico*, in which Caesar consistently refers to himself in the third person. While this is an interesting issue for a theory of indexicality and perspective, it is somewhat peripheral to the topic of this dissertation, and I will therefore abstract away from it here.

(146)



$\mathcal{A} = \{\langle x_2, x_1\rangle, \langle x_5, ? >\rangle\}$

The LDR, x_5, must be resolved to an accessible discourse referent with the label $PHolder_{ref}$. There are two candidates, x_1 and x_4. x_1 is inhabited by the contextual agent, so it contradicts the presupposition $\neg UttPart$ on the LDR, which states that it cannot be resolved to an utterance context participant. So we are left with x_4, the shifted perspective holder of the belief complement. The inhabitant of x_4 is identical to the inhabitant of x_2, the experiencer of the belief event e_1. x_2 is a first person pronoun, which must be resolved to the contextual agent, x_1, so we run into the same problem as before. Consequently, there is no suitable $\mathcal{A}$-function, and the sentence is uninterpretable, which is what we want.

We now have a basic framework for analyzing Latin-style LDRs. In the following sections I will discuss how we can account for the Latin facts. Since indexicality renders the formalism rather complex, I will abstract away from it. That is, I will leave out the context parameter on the interpretation function, discourse referents for contextual participants in the matrix DRS and the presupposition $\neg UttPart(x_1)$ on the LDR.

5.4 The event approach to attitudinal complements and Latin facts

5.4.1 Distribution

In the approach outlined in the previous sections, attitudinal complements are assumed to have relatively rich semantics, while the semantic contribution of the attitudinal verb

is less significant than in more standard approaches: world quantification and perspective shift are both handled by the attitudinal complementizer, while the verb simply contributes an event description. Here, I will look at how this can be reconciled with the morpho-syntactic facts of Latin. The morpho-syntactic realization of attitudinal complements differs substantially across languages (Noonan, 1987; Cristofaro, 2003), so this should be seen as a case study of how morpho-syntax interfaces with attitudinal semantics and perspective shift in one particular case.

If we leave indirect questions aside for the moment, attitudinal complements are realized as AcIs or subjunctive clauses, cf. subsection 2.3.2. In subjunctive clauses, the complementizer *ut* and its negative counterpart *ne* are particularly common, but other complementizers are found too. The surface realization of attitudinal complements is rather different in the case of AcIs and *ut/ne* subjunctive clauses. Subjunctive clauses with *ut/ne* match quite well with a complementizer-based approach to attitudinal semantics and perspective shift, as there is a special overt complementizer used in the relevant cases. AcIs, on the other hand, seem more puzzling. Since AcIs lack an overt complementizer and have an accusative subject, it could be tempting to analyze them as lacking a syntactic complementizer layer altogether and suggest that the subject's case is assigned by the verb (see, e.g., the analysis of Exceptional Case Marking constructions in Adger, 2003, sect. 8.2.5).

Jøhndal (2012, chapter 3) argues convincingly against analyses of the AcI in Latin where the accusative case is assigned by the matrix verb. Instead, he suggests that the accusative should be assigned from within the complement itself. Melazzo (2005) argues furthermore on the basis of word-order patterns within AcIs that they do have a syntactic C-layer.

If both AcIs and *ut/ne* complements have a C-layer and are used as complements to attitude predicates, it is relevant to ask what distinguishes them and whether the distinction is relevant for semantics. To fully answer this question goes beyond the scope of this dissertation. Jøhndal (2012, sect. 3.2.1.3 and 3.3.1.3) investigates the distribution of the two kinds of complements. AcIs are used with a large number of verbs, and do not seem to be restricted to a semantic subclass of attitudinal predicates (Jøhndal, 2012, p. 64). *Ut/ne* complements to attitude predicates mostly occur with desiderative verbs and verbs of fearing such as *volo* 'want' and *timeo* 'fear', and manipulative utterance verbs such as *oro* 'ask (that)' and *impero* 'command' (Jøhndal, 2012, p. 85-86). There are, however, desiderative and manipulative verbs which take AcIs instead, such as *spero* 'hope' and *posco* 'demand' (Jøhndal, 2012, p. 64). The subcategorization for one or the other complement type therefore seems to be syntactic rather than semantic.

In one environment, there does seem to be a productive semantic distinction between the two complement types: utterance verbs such as *dico* 'say' and *clamo* 'shout' generally take AcI complements, but can also take an *ut/ne* complement. In the latter case, the utterance is typically understood as manipulative rather than assertive (Jøhndal, 2012, p. 87).[59] In this dissertation, I will abstract away from the semantic differences that may exist between the two complement types, and take *ut* and the silent complementizer of

[59] A similar distinction is seen in unembedded indirect discourse, cf. section 6.2.

AcIs to have the same denotation.[60] [61]

LDRs are also found in indirect questions, such as in (147):

(147) *ex iis interrogatis [qui manere se$_i$=cum*
from them ask.PTCP.PRF.ABL.PL who.NOM remain.INF REFL.ABL=with
vellent], pro$_i$ *mille volentes Philippo tradit ...*
wanted.SUBJ 1000 volunteers.ACC Philip.DAT hand.over.IND

'When he$_i$ had asked who of them wanted to remain with him$_i$, he hands over a thousand volunteers to Philip.' (Liv. 36.14.11; Riemann, 1884, p. 136)

The indirect question is a complement to a question verb within a participial construction in this example. The question verb is a perfect participle, and hence passive, but its agent, which serves as the LDR antecedent, is coreferent with the matrix subject.

According to the classic analysis of Groenendijk and Stokhof (1982), *wh*-complements are not propositions, but of type $\langle s, \langle s, t\rangle\rangle$. Nothing prevents us from assuming that the complementizer of a *wh*-complement introduces a *content* relation and perspective shift in the same way as in AcIs and *ut/ne*-clauses. In the interrogative cases, the second argument of *content* is of a different semantic type than in the case of AcIs and *ut/ne*-complements.[62] A PCDRT formalization and a full event-based modal semantics for indirect questions is beyond the scope of this dissertation, however.

5.4.2 Non-subject antecedents

In most cases, LDRs in attitudinal complements are subject-oriented, because they are embedded under an attitude predicate whose agent/experiencer is a nominative subject. As we saw in subsection 2.4.2, however, subject orientation is not obligatory. Examples typically involve predicates which take non-subject agents/experiencers, as in the following cases ((148a) and ((148b))=(21c) and (2)):

(148)

a. *A Caesare$_i$ valde liberaliter invitor ... [sibi$_i$ ut*
by Caesar very graciously invite.PASS.PRS.IND.1SG REFL.DAT that
sim legatus] ...
be.PRS.SBJV.1SG staff.officer.NOM

'I have very graciously been invited by Caesar$_i$ to be his$_i$ staff officer.' (Cic. Att. 2.18.3; Benedicto (1991, ex. (25)))

[60] Both AcIs and *ut*-clauses are used in non-attitudinal environments as well, cf. subsection 2.3.2. In such cases, I assume that the complementizers have different denotations than in attitudinal complements.

[61] A few attitudinal predicates which take AcI complements possibly require a negation of the complement proposition, such as *obliviscor* 'forget' and *nego* 'deny'. If a negated complement proposition is indeed called for, it might be due to a semantic ambiguity of the attitudinal complementizer or some syntactic operation such as *neg*-raising.

[62] This solution is inspired by Fabricius-Hansen and Sæbø (2004, sect. 3.2.3).

b. *Iam inde ab initio Faustulo$_i$ spes fuerat [regiam*
already since from beginning Faustulus.DAT hope.NOM was.IND royal
stirpem apud se$_i$ educari].
lineage.ACC before REFL.ACC educate.INF.PASS

'Already from the beginning, Faustulus$_i$ had the hope that someone of royal lineage was being educated with him$_i$.' (Liv. 1.5.5; Benedicto, 1991, ex. (21))

c. *Instruitur acies, nec Veiens hostis*
make.PASS.IND battle.line.NOM and.not of.the.Veii.NOM enemies.ACC
Etruscae=que legiones$_i$ detractant. Prope certa spes
Etruscans.GEN=and legions.NOM decline.NOM nearly certain hope.NOM
erat [non magis se$_i$=cum pugnaturos quam
was.IND not more REFL.ABL=with fight.PTCP.FUT.ACC.PL than
pugnaverint cum Aequis.]
fought.SBJV with Aequi

'A battle line is formed, and the legions$_i$ of the Veii and the Etruscans do not decline [an encounter with] the enemies. There was an almost certain hope that [the Romans] would fight with them$_i$ no more than than they had fought with the Aequi.' (Liv. 2.46.1; Riemann, 1884, p. 137)

In (148a), the three-place report predicate *invito* 'invite' is passivized. The nominative subject, which here is an unpronounced first person, is the goal argument, while the agent is in an agentive PP. The LDR is bound by the agent argument. In (148b), the nominal attitudinal predicate *spes* 'hope' is used. The experiencer of the hoping state, which is the antecedent of the LDR, is realized as a dative possessor argument. The same nominal attitude predicate is used in (148c). In this case, however, the experiencer of the hoping state and antecedent of the LDR are not present in the same sentence. However, it is clear from the immediately preceding sentence who the experiencer is, namely the legions of the Veii and the Etruscans.

The present theory makes reference to thematic roles, not subjects. As long as the LDR antecedent is an agent/experiencer of a contentful event, it is irrelevant how this argument is syntactically realized.[63] Example (148c), however, differs a bit from the

[63](149) is mentioned among standard examples of non-subject-oriented LDRs by Benedicto (1991, p. 180), Solberg (2011, p. 23) and Jøhndal (2012, p. 111):

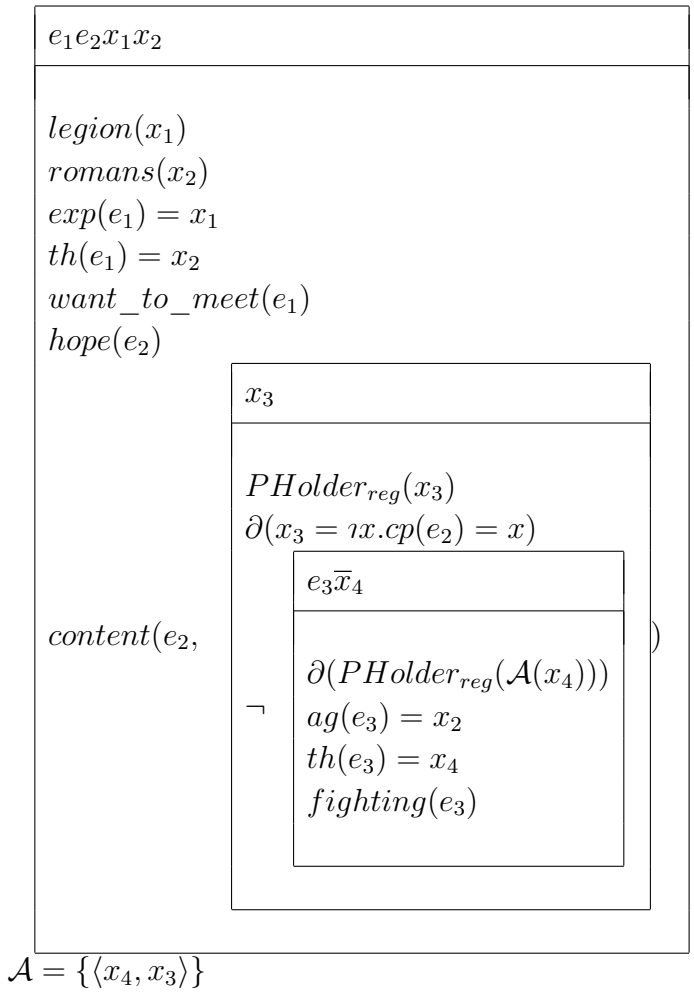
(149) *aratoris$_i$ ... interest [ita se$_i$ frumenta habere [ut decumae quam*
farmer.GEN is.important.IND so REFL.ACC crops.ACC have.INF that tithe.NOM as
plurimo venire possint]]
much come.INF can.SBJV

'To the farmer$_i$ it is important he$_i$ has crops so heavy that the tithes may fetch the highest prices' (Cic. Ver. 3.147; ex. from, and translation based on, Benedicto, 1991, ex. (23))

The verb used here, *intersum*, has an impersonal use, which Oxford Latin Dictionary (Glare, 2012, sense 8b) translates as 'it makes a difference, it is important, it matters'. The verb takes a clausal complement and in cases like this, a genitive individual argument. It might be that the verb denotes a knowledge state of which the individual argument is an experiencer, in which case examples such as (149) can be

examples we have treated so far in that the experiencer is not realized in the sentence. Simplifying somewhat, this example can be analyzed as follows:

(150)



According to the denotation of the perspective-shifting complementizer in (136a), the register representing the perspective holder must be the $cp(e_2)$, i.e., the agent or experiencer, of the contentful event. Even though there is no syntactic argument which realizes the experiencer argument of e_2 in (150), e_2, being a cognitive state, must have an experiencer. In other words, $\imath x.cp(e_2) = x$ must map to some individual, even though there is no argument explicitly identifying this individual. Moreover, for the text to make sense, it is necessary for the reader to infer that the experiencer of e_2 is x_1, although in this case, this inference is presumably pragmatic rather than strictly semantic.

The theory, as it currently stands, predicts that an attitude predicate cannot shift the perspective to more than one individual, unless of course it has multiple distinct meanings: The $PHolder$ discourse referent is associated with the presuppositional identity condition $\partial(x_1 = \imath x.cp(e) = x)$ (cf. (136a)): the perspective holder is equal to the conscious participant, i.e., the agent/experiencer, of the attitudinal event. *cp* is a function mapping from an event to a unique individual, and so are the thematic roles *agent* and *experiencer*, for which *cp* is a meta-variable. The iota operator ensures, in a deterministic fashion, that

treated together with the examples in (148). Alternatively, they can be treated as cases of long-distance binding in benefactive constructions, such as with verbs of deserving, discussed in subsection 5.8.3.

the *PHolder* register is inhabited by the unique individual that $cp(e)$ picks out (cf. the definition of the iota operator in (277k)).

There are, however, a few cases which are somewhat surprising given this prediction. One of them is the phrasal predicate *certiorem facio* 'assure, inform'. *Certiorem facio* can be decomposed into *facio* 'make, do' and *certiorem*, the comparative accusative form of the adjective *certus*, which when used about people can mean 'assured, convinced, confident' (Glare, 2012, *certus*, senses 11 and 12). The predicate takes an individual argument, and can take a clausal argument which is either an AcI or a subjunctive *wh*-clause. The word-for-word translation is something along the lines of 'make someone more assured that'. The semantics of the comparative morpheme on *certiorem* is, I assume, rather attenuated, and a good English phrasal equivalent might be 'make someone aware that'.[64] The passivized form *certior fio* is also common, in which case the assured is in the nominative and the communicative agent is in a non-obligatory agentive PP.

LDRs in complement clauses to *certiorem facio* can be anteceded by the communicative agent, as in (151a) and (151b). There are, however attested instances of LDRs referring to the one who has been informed, as in (151c):[65]

(151)

a. *... Amberri$_i$ ... Caesarem$_j$ certiorem faciunt [sese$_i$ ...*
Amberri.NOM ... Caesar.ACC assured.CPV.ACC make.IND REFL.ACC
non facile ab oppidis vim hostium prohibere.]
not easily from towns violence.ACC enemies.GEN prevent.INF

'The Amberri$_i$ make Caesar$_j$ aware that they$_i$ cannot easily hold the violence of the enemies away from the towns.' (Caes. Gal. 1.11.3)

b. pro$_i$ *... ab Lucio Roscio$_j$ ... certior factus est*
by Lucius Roscius assured.CPV.NOM done.PTCP.PRF.NOM is.IND
[magnas Gallorum copias ... oppugnandi sui$_j$ causa
large.ACC Gauls.GEN force.ACC fight.GER.GEN REFL.GEN reason.ABL
convenisse ...]
assemble.PRF.INF

'He$_i$ [i.e., Caesar] was made aware by Lucius Roscius$_j$ that a large force of Gauls had gathered to fight him$_j$.' (Caes. Gal. 5.53.6; Kühner and Stegman, 1976/1997a, p. 609)

[64]The expression is also attested with the non-comparative form *certus*, according to Glare (2012, *certus*, senses 12).

[65]I have looked for examples in the PHI corpus (see section 1.2). The relevant examples from Classical Latin seem to be the following. The communicative agent is the antecedent in Caes. Gal. 1.11.3, 5.53.6, Liv. 37.50.8. (This antecedence pattern is also found in Digesta Iustiniani Augusti 29.2.51, a text from late antiquity). The one who is informed is the antecedent in Caes. Civ. 1.12.1, Nep. Att. 12.4.

c. … *factum* *est* *ut* *eodem* *nuntio*$_i$ *Saufeius*$_j$
do.PTCP.PRF.NOM is.IND that same messenger.ABL Saufeius.NOM
fieret *certior* *[se*$_j$ *patrimonium*
make.PASS.PST.SBJV assured.CPV.NOM REFL.ACC property.ACC
amisisse *et* *recuperasse.]*
lose.PRF.INF and regain.PRF.INF

'It happened that Saufeius$_j$ was made aware through the same messenger$_i$ that he$_j$ had lost and regained his property.' (Nep. Att. 25.3)

In (151a), the phrasal predicate is used in the active voice, and the LDR refers to the nominative subject, that is, the communicative agent. In (151b), the predicate is passivized, and the LDR is bound by the communicative agent in an agentive PP. (151c) can also be analyzed as a passive (but see below). The one who has been informed, the subject, is the antecedent of the LDR.

For this predicate, there are reasons to assume that a lexical ambiguity is involved: The passive forms of the verb of the phrasal predicate, *facio* 'make, do', coincide with the inflection of *fio* 'become'. Sentences with *fio* are therefore often ambiguous between a causative reading and an inchoative reading. Given this, it is highly likely that *certior fio* can have both a passive causative meaning, 'I am made aware', and an inchoative meaning, 'I become aware'. The first meaning plausibly involves an utterance event by an utterance agent different from the nominative subject, while the second meaning makes reference to a mental state of the nominative subject. If this explanation is on the right track, we can argue that the perspective is shifted to the utterance agent on the causative reading and to the experiencer of the mental state on the inchoative reading. The active form *certiorem facio* will unambiguously have the causative reading.

It is hard to test whether a lexical ambiguity of this kind can explain the observed antecedence ambiguity without access to native speaker judgements, and impossible when there are only 6 attested examples in total (cf. footnote 65). However, the examples are at least compatible with such an explanation: the two examples of LDR binding by the experiencer of the mental state both use *fio*. It is interesting to compare examples (151b) and (151c): In (151b), the LDR is bound by the utterance agent from an agentive PP. In (151c), where the experiencer of the mental state is the LDR antecedent, the sentence admittedly also contains a person conveying a message. However, this individual is not expressed in the form of an agentive PP, but as a bare ablative, *eodem nuntio* 'same messenger.ABL'. An ablative DP without a preposition is not the normal way of expressing the agent in a passive construction, and it is therefore reasonable to take the ablative as an instrumental ablative, which is consistent with the inchoative reading: "Sauferius became aware through the same messenger that...". In order to falsify this ambiguity account, we would need an active example or a clearly agentive passive example where the LDR is not oriented towards the utterance agent.

There are, however, some additional cases of antecedence ambiguities which are less likely the result of lexical ambiguities. In (152), an LDR occurs in the complement to *ei nuntiatum esset* 'it was announced to him that', and the antecedent is the indirect object.

The verb used here is an impersonal passive of *nuntio* 'announce':

(152) *... cum ei$_i$ nuntiatum esset [quosdam sibi$_i$ insidiari] ...*
when him.DAT announce.PTCP.PRF.NOM was.SBJV somebody.ACC REFL.DAT lie.in.ambush.INF

'... when it was announced to him$_i$ that someone was planning an attack on him$_i$ ...' (Nep. Dat. 6.2; Kühner and Stegman, 1976/1997a, p. 609)

The antecedence option in (152) is at first sight rather surprising: LDRs in complements to three-place speech predicates in Latin are generally oriented towards the agent, not the dative argument. It seems likely that the impersonal passive use of the verb is part of the explanation of the antecedence pattern in this case. Kühner and Stegman (1976/1997a, p. 609), who report the example, suggest that this kind of binding occurs because *ei nuntiatum esset* is roughly equivalent to *is nuntium accepisset* 'he received the news that'. This seems descriptively plausible: *Ei nuntiatum esset* does presumably imply the acquisition of knowledge by the indirect object, and LDRs are widely attested in complements to knowledge acquisition predicates. It is not entirely clear how we should make sense of this observation in the compositional account presented here, as the knowledge acquisition reading seems to be inferred in this case.

A similar issue arises with the verb *audio* 'hear': Like other acquisition-of-knowledge predicates, *audio* allows subject-oriented LDRs, as in (153a).[66] However, when an animate source is expressed in a PP with the preposition *ex* 'from', the LDR can refer to the animate source, cf. (153b) (=(24)).[67]

(153)

a. pro$_i$ *... [provinciam sibi$_i$ decretam] audiet ...*
province.ACC REFL.DAT decide.PTCP.PRF.ACC hear.FUT.IND ...

'He$_i$ will hear that the province has been assigned to him$_i$.' (Cic. Phil. 11.24)

b. *ibi ego$_i$ audivi ex illo$_j$ [sese$_j$ esse Atticum].*
there I.NOM heard.IND from him REFL.ACC be.INF native.of.Attica.ACC

'There I$_i$ heard from him$_j$ that he$_j$ was a native of Attica.' (Ter. An. 927; Jøhndal, 2012, ex. (77), p. 131)

Parallel examples are attested in Japanese (Sells, 1987, p. 453-454) and for logophors in Ewe (Clements, 1975, p. 158-160). This binding pattern appears to be ungrammatical in Mandarin, however (Pan, 2001, p. 291).

The case of *audio* is in a sense the reverse of what we saw with *ei nuntiatum esset* in (152). With *ei nuntiatum esset*, a lexical utterance verb is used, but the LDR binding

[66]Note that the auxiliary *esse* 'be.INF' has been elided in the AcI complement in this example. Such elisions are very frequent in Latin (Menge, 2000, § 250) and immaterial to the issue under investigation.

[67]The examples of source-oriented binding with *audio* in Classical Latin seem to be (according to my data collection from the PHI corpus): Ter. An. 927, Cic. Dom. 135, Cic. Mil. 44, Cic. Att. 10.11.2, Suet. Dom. 12.2.

seems to make reference to an inferred acquisition-of-knowledge eventuality. With *audio*, a lexical acquisition-of-knowledge predicate is used. However, the presence of an animate source makes salient an utterance event by a certain individual. It seems likely that it is this inferred utterance event which makes it possible for the LDR to pick up the source. The different antecedence patterns can probably not be explained in terms of lexical ambiguity: if I say "I heard from Caesar that the troops were coming", an utterance event is easily inferred, while if I say "I heard from the forest that the troops were coming", the same inference isn't made (disregarding fictional scenarios where forests can talk). Positing a special denotation for *audio ex* meaning something like 'hear someone say' would be redundant, because an utterance can already be inferred from the regular meaning of *audio* combined with an animate source.

To sum up, the surprising antecedence patterns observed in (152) and (153) are compatible with an event-based explanation. In (152), the LDR is anteceded by the conscious participant of a knowledge acquisition eventuality, and in (153b), the LDR is anteceded by the agent of an utterance event. The challenge, however, is that these eventualities appear to be inferred rather than strictly derived from the compositional semantics. They are therefore difficult to capture entirely in the compositional, event-based theory of perspective shift developed here. In subsection 7.3.2, I will briefly discuss how we can make sense of such inferences, given the overall framework of this dissertation.

5.4.3 LDRs with plural antecedents

Many of the Latin examples I have presented so far involve LDRs with plural antecedents, as in (154) (=(17b)). This needs to be accounted for.

(154) *Vbii$_i$* ... *magnopere* *orabant* *[ut* *sibi$_i$* *auxilium* *ferret]* ...
Ubii.NOM greatly entreated.IND that REFL.DAT help.ACC bring.SBJV

'The Ubii$_i$ entreated with insistence that he should bring them$_i$ help.' (Caes. Gal. 4.16.5; Solberg, 2011, ex. (1.9b))

In this section I will add a basic plural semantics, which makes it possible to treat cases like (154), where the antecedent is plural and the LDR refers to that plural entity. Some slightly more complex plural cases will be discussed in subsection 7.2.3.

A semantics for plurals has to handle a range of complex phenomena, and this is even more true for a theory of plural anaphors. The following sentences exemplify just a few of these phenomena:

(155)

a. Tom, Dick and Harry carried the piano upstairs. (Link, 1983, ex. (4), attributed to G.J. Massey)

b. The children bought an ice cream.

c. John$_i$ took Mary$_j$ to Acapulco. They$_{i+j}$ had a lousy time. (Kamp and Reyle, 1993, ex. (4.4i))

d. Susan has found every$_i$ book which Bill needs. They$_i$ are on his desk. (Kamp and Reyle, 1993, ex. (4.7))

On the most salient reading of (155a), the carrying of the piano was not performed individually by Tom, Dick and Harry, but rather was a task taken on by the three of them as a group. This is called the *collective* reading of the plural. But in (155b), the buying of ice cream was presumably not a collective effort. Rather, the children each bought an ice cream. This is called the *distributive* reading.

(155c) and (155d) exemplify two of the antecedence options of plural anaphors. The plural in the second sentence of (155c) denotes the sum of different individuals in the context. Pretheoretically, we could say that the anaphor in (155d) refers to the universal quantifier in the preceding sentence. However, universal quantifiers do not introduce a discourse referent in the matrix DRS in DRT, cf. subsection 4.3.2. These two antecedence patterns are called *summation* and *abstraction*, respectively, by Kamp and Reyle (1993, chap. 4).

Accounting for the whole range of plural phenomena such as those exemplified above would complicate the system considerably. The aim here is therefore more modest: I will only consider the collective reading of the plural, and I will not take into consideration complex anaphoric options such as (155c) and (155d). A general DRT treatment of plural anaphora can be found in Kamp and Reyle (1993, chap. 4). The logic of plurality and the part-of relation will be treated informally here, and I refer the reader to Link (1983) for the formal details.[68]

In Link's theory of plurals, there is no type difference between singular and plural nominal constituents. Both introduce individuals. The difference is instead explained in terms of a part-of relation. Plural, or *non-atomic*, individuals are distinguished from singular, or *atomic*, individuals in the following way: from a non-atomic individual X associated with a certain property, it is possible to distinguish subparts not equal to X which are also individuals with that property. From an atomic individual x associated with a certain property, you cannot distinguish subpart individuals different from x itself with that property.

Let us say we have a model M with a domain with four atomic individuals, Peter, Paul, Mary and Mathilda, and among them, Paul, Mary and Mathilda are soldiers, given this model. The DP *The soldiers* introduces into a discourse a non-atomic individual, namely the sum of Paul, Mary and Mathilda, which contains multiple proper subparts: the atomic individuals Paul, Mary and Mathilda. Moreover, the DP also contains 3 non-atomic individuals which have the *soldiers* property: Paul and Mary, Paul and Mathilda, and Mary and Mathilda.

We say that the individual consisting of Paul and Mary is the *i(ndividual)-sum* of Paul and Mary. The *sum operator* $\oplus$ is used to make plural individuals out of atomic individuals. Peter$\oplus$Mary is the non-atomic individual whose subparts are Peter and Mary, and Peter$\oplus$Paul$\oplus$Mary is the individual which has Peter, Paul and Mary as subparts (cf. Sudo, 2015, sect. 5.2). I use $\sqsubseteq$ for the subpart relation, and $\sqsubset$ for the proper subpart

[68] In addition to these sources, I am indebted to the excellent introduction to the issues of plural semantics by Sudo (2015, part II).

relation.

We can now define predicates $At(omic)$ and $NonAt(omic)$ to distinguish the two kinds of individuals (Kamp and Reyle, 1993, sect. 4.3.1):

(156)

a. $At(x) = \neg\exists y.y \sqsubset x$

b. $NonAt(x) = \exists y.y \sqsubset x$

The domain D_e of individuals will now not only consist of the atomic individuals, but also all i-sums of atomic individuals. The domain D_e in the model given above will be as follows, where D_{At} and D_{NonAt} are the domains of atomic and non-atomic individuals, respectively (cf. Sudo, 2015, p. 80):

(157) $D_{At} = \{Peter, Paul, Mary, Mathilda\}$, $D_{NonAt} = \{Peter \oplus Paul, Peter \oplus Mary, Peter \oplus Mathilda, Paul \oplus Mary, Paul \oplus Mathilda, Mary \oplus Mathilda, Peter \oplus Paul \oplus Mary, Paul \oplus Mary \oplus Mathilda, Peter \oplus Mary \oplus Mathilda, Peter \oplus Paul \oplus Mathilda, Peter \oplus Paul \oplus Mary \oplus Mathilda\}$, $D_e = D_{At} \cup D_{NonAt}$

Now we have a basic plural semantics where the domain of individuals consists of both atomic and non-atomic individuals. How can we account for the semantic difference between singular NPs such as *soldier* and plural ones such as *soldiers*? The semantics of the singular NPs does not change; they still denote sets of singular individuals which have a particular property. Plurals have a more complex semantics: they denote sets of individuals which are such that all atomic subparts have a specific property. Therefore, *soldiers* denotes a set of individuals whose atomic subparts are soldiers (Sudo, 2015, sect. 6.1.2).[69] Formally:

(158)

a. $[[soldier]]^{M,a} = \lambda x \in D_{At}.x$ is a soldier

b. $[[soldiers]]^{M,a} = \lambda x \in D_e.\forall y \in D_{At}.y \sqsubset x \rightarrow y$ is a soldier (cf. Sudo, 2015, ex.s (6.39a+b))

We can now implement a plural semantics in PCDRT. Since there is no type difference between atomic and non-atomic individuals, the system of states and registers does not need to be modified. Plural nominal predicates, such as *soldiers* in (158b), will be associated with a star $*$ (cf. Kamp and Reyle, 1993, p. 327). Note that labels such as $PHolder_{reg}$ will not have a star, since the singular/plural distinction is on the level of individuals, not registers. The following denotations exemplify these changes:[70]

[69](158) is a slight simplification of Sudo's denotations, as he also discusses instances where plural nouns refer to atomic individuals. For example, the question "Does John have children?" can be felicitously answered by "Yes, he has a girl" (Sudo, 2015, ex. (6.32)). I disregard such readings here, since they are not relevant to the present topic.

[70](159) is the denotation of the full DP *soldiers*, not the nominal predicate, unlike in (158b).

(159) $[[\text{soldiers}]]^{M,a} =$

Abbreviated notation

$\lambda P.$ | x_1 | $soldiers^*(x_1)$ | $; P(x_1)$

Full notation

$\lambda P.\lambda w.\lambda i.\lambda o.\partial(i[x_{i_1}]o) \wedge soldier^*(v(o)(x_{i_1}))(w) \wedge P(x_{i_1})(w)(i)(o)$

As long as our only goal is to account for total coreference between anaphor and antecedent, the anaphoric semantics does not need to be modified in any way. Plural anaphors are simply anaphoric individual registers assigned to non-atomic individuals.

We can now represent the semantics of sentences where an LDR takes a plural antecedent, such as (154):

(160)

e_1x_1

$Ubii^*(x_1)$
$ag(e_1) = x_1$
$insistent\_entreating(e_1)$
$content(e_1,$ $e_2x_2\overline{x}_3\overline{x}_4$ $PHolder_{reg}(x_2)$ $\partial(x_2 = x_1)$ $\partial(PHolder_{reg}(\mathcal{A}(x_4)))$ $ag(e_2) = x_3$ $goal(e_2) = x_4$ $giving\_help(e_2)$ $)$

$\mathcal{A} = \{..., \langle x_4, x_2\rangle\}$

The LDR x_4 has one accessible antecedent, x_2, the $PHolder$ of the complement clause. x_2 is assigned to an individual coreferent with the subject of the superordinate attitude event, namely x_1, the Ubii. x_1 is a plural individual, as indicated by the star on the condition $Ubii^*(x_1)$. Therefore, the $PHolders$ of the complement and the LDR are plural too, since they are coreferent with x_1.[71]

[71] Kamp and Reyle (1993) also add the condition $NonAt$ to plural discourse referents. I ignore that here.

5.5 Multiple embedding

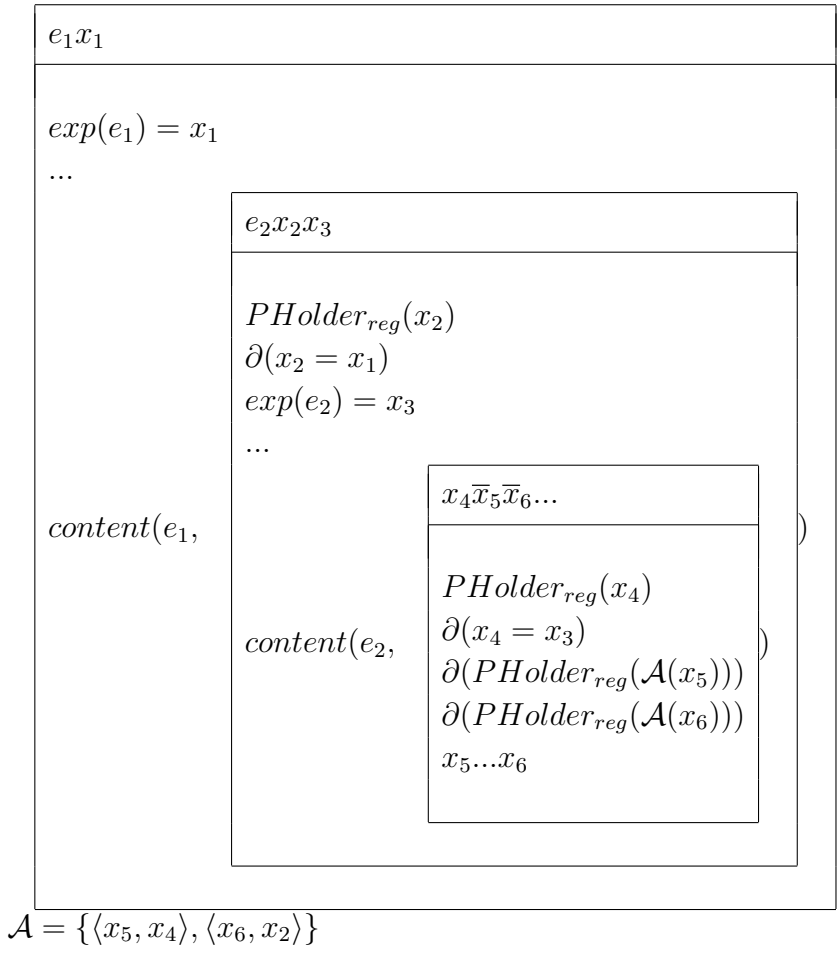
5.5.1 Indirect discourse within indirect discourse

A prediction

We saw in subsection 5.3.6 how we can account for the ambiguity of LDRs in attitudinal complements embedded within attitudinal complements: the complementizer of each attitudinal complement makes available a perspective-shifting register. The LDR has a presuppositional restriction which states that it must be resolved to an accessible (shifted) perspective holder, and the perspectival registers of both complements comply with that restriction.

This account makes an interesting prediction: If one attitudinal complement embedded under two (or more) attitude predicates contains two (or more) LDRs, it should in principle be possible for the LDRs to take different antecedents. (161) illustrates this kind of configuration:

(161)



There are two attitudinal events e_1 and e_2, and the latter is embedded under the former. In the complement of e_1, a perspective holder x_2 is introduced, which is coreferent with the experiencer of e_1, x_1. Similarly, in the complement to e_2, a perspective holder x_4 is introduced, which is coreferent with x_3. In this configuration, it should be possible to have two LDRs (or other perspective anaphors), x_5 and x_6, in the deepest complement, assigned to different perspective holders.

Shift Together

Configurations like this are predicted to hold by several other semantic theories of LDRs, logophors and shifted indexicals (e.g., Schlenker, 2003; Sells, 1987; Pearson, 2015a) . However, they have been argued not to occur in cases of shifted indexicals (cf. Anand and Nevins, 2004; Deal, 2014; Schlenker, 2015): it is claimed not to be possible to have indexicals referring to different contexts within the scope of a context-shifting operator. Bylinina et al. (2014) claim that this restriction also holds for perspective-sensitive items. Before returning to perspective, let us first look briefly at Anand and Nevins' data and account of context shift.

In Zazaki, indexicals can be shifted under attitude verbs, cf. section 2.8. If one indexical is shifted, all the other indexicals must also shift, which Anand and Nevins call *Shift Together*. An attitudinal complement with two indexicals like (162) should have four possible readings, but only two of them are attested (c^* indicates the actual context):

(162) *Vɨzeri Rojda Bill=ra va kɛ ɛz to=ra miradiša*
yesterday Rojda Bill=to said that I you=to angry-be.PRS

'Yesterday Rojda said to Bill, "I am angry at you."'
'Yesterday Rojda said to Bill, "$ag(c^*)$ is angry at $addr(c^*)$."'
*'Yesterday Rojda said to Bill, "$ag(c^*)$ is angry at you."'
*'Yesterday Rojda said to Bill, "I am angry at $addr(c^*)$."' (Zazaki;example, glosses, translation and judgements according to Anand and Nevins, 2004, ex. 13)

Either both *I* and *you* must refer to the shifted agent and addressee respectively (i.e. Rojda and Bill), or they must refer to the external agent and addressee. The two indexicals cannot pick antecedents in different contexts.

Anand and Nevins (2004) assume a centred worlds semantics. A sentence is interpreted with respect to both a context parameter c and an intensional index i. Both the context and the index parameters are tuples consisting of a world, an agent, a time, a place, an addressee etc. Attitude predicates quantify over indexes, but leave the context parameter untouched:

(163) a. $[[\phi]]^{c,i}$

b. $[[say\ \phi]]^{c,i} = \lambda x.\forall j$ compatible with what x says in $i, [[\phi]]^{c,j}$
(Anand and Nevins, 2004, ex. (23))

Indexicals get their value fixed by the context parameter only in the usual Kaplanian way, and therefore remain unaffected by index quantification:

(164) $[[\text{I}]]^{k,j} = ag(k)$ (Anand and Nevins, 2004, ex. (24a))

Context shift is due to the presence of an operator $OP_\forall$, which overwrites the context parameter with the values of the index parameter:

(165) $[[OP_{\forall}\ \phi]]^{k,j} = [[\phi]]^{j,j}$ (Anand and Nevins, 2004, ex. (25))

Verbs such as *say* can, but need not, occur with $OP_{\forall}$ in Zazaki:

(166) a. $[[say\ OP_{\forall}\ \phi]]^{c,i} = \lambda x.\forall j$ compatible with what x says in $i, ([[OP_{\forall}\ \phi]]^{c,j})$

b. $[[OP_{\forall}$ [I am rich]$]]^{c,j} = [[$ [I am rich]$]]^{j,j} = 1$ iff $ag(j)$ is rich in j. (Anand and Nevins, 2004, ex.s (26) and (27))

With this framework, the readings of (162) are predicted. The sentence can occur with or without $OP_{\forall}$:

(167)

a. Yesterday Rojda said to Bill that I am angry at you.

b. Yesterday Rojda said to Bill $OP_{\forall}$ that I am angry at you.

In (167a), both indexicals will pick up values from the external context, since there is no context shifter. When $OP_{\forall}$ is present, as in (167a), all indexicals within the scope of the operator must be shifted, since $OP_{\forall}$ overwrites the values of the context parameter.

Bylinina et al. (2014) claim that *Shift Together* also holds for perspective shift, but they do not discuss attitudinal cases in connection with this restriction. They have a tentative analysis along the lines of Anand and Nevins (2004), where perspective-sensitive items are interpreted relative to a perspective parameter, which is set to the speaker by default. A non-obligatory operator shifts the perspective parameter for all perspective-sensitive items within its scope.

Shift Together in Latin?

To sum up, we have seen that the theory built up here does not predict *Shift Together*. However, context shift has been argued to be sensitive to this constraint in several languages, and Bylinina et al. (2014) claim that the constraint is also relevant for perspective shift. It is therefore interesting to check whether there are attested Latin cases which violate *Shift Together*.

It is difficult to find actual Latin sentences which could show that *Shift Together* does not hold for Latin LDRs. This is hardly surprising, given the complexity of the configuration: first, we need a deeply embedded report; second, it needs to contain two reflexive pronouns; third, the two pronouns need to be LDRs with different antecedents. Note that having two reflexives with different reference, even if grammatical, presumably is stylistically rather odd. Fruyt (1987, p. 211) claims that the configuration sometimes occurs. She gives only one example, however, namely (168). I am not aware of any other occurrences of this pattern.

(168) *... cum aliquot post annis Maximus$_i$ id oppidum recepisset,*
when some after years Maximus.NOM that town.ACC took.back.SBJV
rogaret=que eum$_i$ Salinator$_j$ [ut pro$_i$ *meminisset [opera*
asked.SBJV=and him.ACC Salinator.NOM that remember.SBJV effort.ABL
sua$_j$ se$_i$ Tarentum recepisse]] ...
REFL.POSS.ABL REFL.ACC Tarentum took.back.INF.PRF

'When Maximus$_i$ had taken that town back some years later, and Salinator$_j$ had asked [that he$_i$ remember [that he$_i$ had taken Tarentum back because of his$_j$ efforts]], ...' (Cic. de Orat. 2.273; Fruyt, 1987, p. 211)

The complement containing the two reflexives is embedded under *meminisset* 'remember', which has Maximus as subject. That attitude verb is itself in an attitudinal complement under *rogaret* 'asked', which has Salinator as its subject. The possessive reflexive *sua* is anteceded by Salinator, and the personal reflexive *se* by Maximus.

The possessive reflexive is not usually considered in this dissertation, and there is a good reason for that (cf. section 2.2): although it mostly is used as a local reflexive or an LDR, it has an occasional different use as an emphatic possessive with a different referential behavior. We cannot definitively rule out that *sua* in this example has that emphatic use, which makes it problematic. So unless less problematic examples are found, we must remain agnostic about the question of whether *Shift Together* holds or not in Latin.

Independent of the data question, however, I am skeptical about hardcoding *Shift Together* into the semantics in the way Anand and Nevins (2004) do. By making the shifting operator non-obligatory, the ambiguity of shifted elements is explained in a purely structural way. Let us say a sentence in a language with context shift contains a first person pronoun in an attitudinal complement. If that first person picks up the external speaker, the attitude verb is not associated with a shifting operator in the logical form. If the shifted first person picks up the subject of the attitude verb, there is a shifting operator in the structure of the sentence. The question then becomes where this operator comes from and why it is sometimes present and sometimes absent. Unless that question can be answered in a motivated way, a structural account along such lines seems to be *ad hoc* and unexplanatory. It appears to me to be difficult to formulate a semantic account without stipulations which can handle both antecedence ambiguity and *Shift Together*: if a shiftable element can take different antecedents in a given environment, it is hard to see a principled semantic reason for why two shiftable elements cannot take different antecedents in that same environment. However, it is not given that *Shift Together* is a constraint which is semantic or structural in nature. It could be due to pragmatic factors or processing.

5.5.2 LDRs in non-complement clauses in indirect discourse

We now turn to LDRs in finite non-complements within indirect discourse. As we saw in subsection 2.4.1, LDRs readily occur in non-complement finite clauses within indirect

discourse, such as adverbial clauses (169a) (= (19)) and relative clauses (169b):[72]

(169)

a. *Lepta$_i$ me rogat [ut, [si quid sibi$_i$ opus sit],*
Lepta.NOM me.ACC asks.IND that if any.NOM REFL.DAT need be.SBJV
accurram]
run.to.SBJV.1P

'Lepta$_i$ asks me to run to him if he$_i$ needs me.' (Cic. Att. 13.48.1; Jøhndal, 2012, ex. (30a), p. 109)

b. *(Ad haec Caesar$_i$ quae visum est respondit;*
to these Caesar.NOM what.NOM see.PTCP.PRF.NOM is.IND answered.IND
sed exitus fuit orationis:) ... [licere ... in Vbiorum
but ending.NOM was.IND speech.GEN be.allowed.INF in Ubii.GEN
finibus considere, [quorum sint legati apud se$_i$]] ...
land settle.INF whose are.SBJV envoys.NOM with REFL.ACC

'(To this, Caesar$_i$ answered something which seemed good, but the end of his speech was:) ... They [i.e. the Germans] were allowed to settle in the land of the Ubii, whose envoys were with him$_i$' (Caes. Gal. 4.8.1;4.8.3)

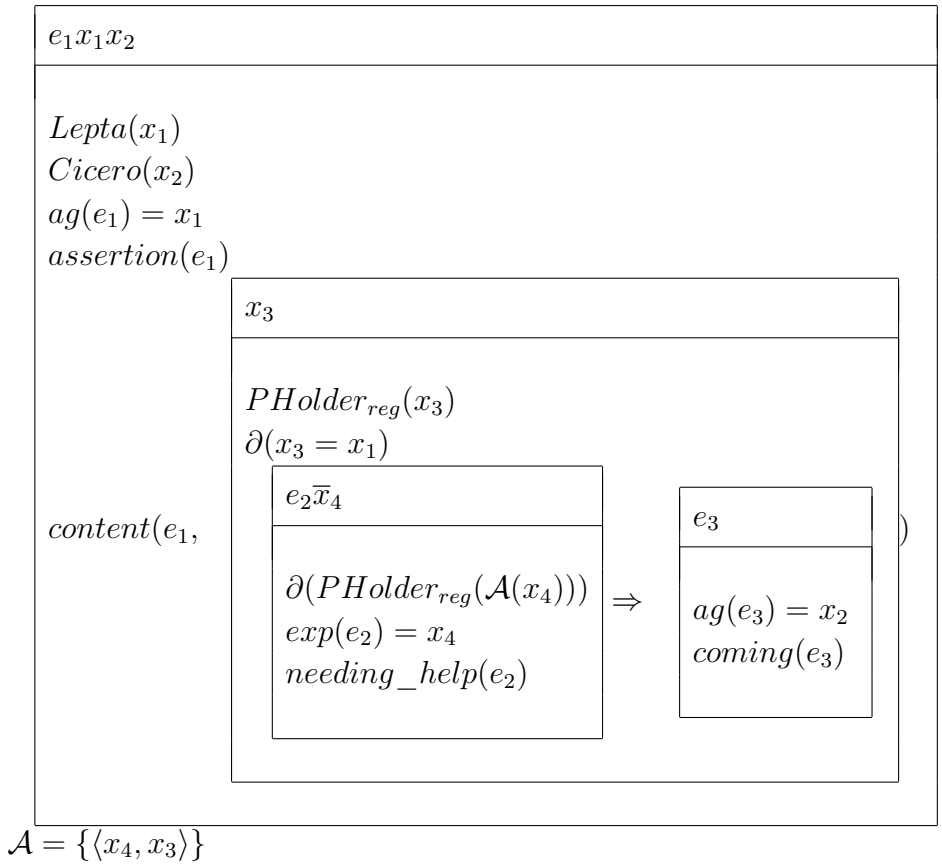
Non-complement subjunctive clauses within indirect discourse are predicted to be transparent to long-distance binding in the current framework. I will spell out why, using the following constructed sentence, which is based on (169a):

(170) Lepta$_i$ says that Cicero will come if SE$_i$ needs help.

This sentence can be represented as follows:

[72] (169b) is in unembedded indirect discourse, but embedded and unembedded indirect discourse behave similarly with respect to this phenomenon.

(171)



Since the conditional construction holds within the scope of Lepta's belief, the anaphoric register x_4 can pick up the perspective holder x_3 in the superordinate DRS. As long as the LDR is within the scope of a perspective holder, it doesn't matter that the LDR is embedded in additional clausal structure, since there will always be an accessibility path to the superordinate DRS where the perspective holder is found.

Relative clauses, adverbial clauses and the like, which depend on the indirect discourse, are usually put in the subjunctive in Latin, as explained in subsection 2.3.2. Occasionally, however, indicative clauses are also found in this environment. An indicative adjunct clause within indirect discourse is usually interpreted as a comment by the external speaker, as in (172) (Menge, 2000, § 471; Kühner and Stegman, 1976/1997b, § 239; Jøhndal, 2012, sect. 4.1.2.2):

(172) *Hic quis potest esse ... tam mente captus,*
here who.NOM can.IND be.INF so mind.ABL take.PTCP.PRF.NOM
qui neget [haec omnia [quae videmus], ... deorum
who denies.SBJV these.ACC all.ACC which.NOM see.IND.2P gods.GEN
immortalium ... potestate administrati]?
immortal.GEN power.ABL administer.PASS.INF

'Who here is deranged to the extent that he denies that all these things that we see are administered through the power of the immortal gods?' (Cic. Catil. 3.21; Menge, 2000, p. 659)

Videmus 'see.IND.2P' in *haec omnia quae videmus* 'all these things that we see' is in the indicative, presumably because it is to be attributed to the external speaker rather than being part of the indirect discourse.

Given this semantic distinction, it would be interesting to know whether the indicative affects the possibility of long-distance binding. I am aware of 8 (possibly 9) examples of AH-referring LDRs in the Classical Latin literature which occur in indicative clauses within indirect discourse.[73] Jøhndal (2012, p. 110) discusses the examples in (173):

(173)

a. pro$_i$ *dicit* *[capram* *[quam* *dederam* *seruandam*
says.IND she-goat.ACC which.ACC give.PST.PRF.IND.1SG serve.GER.ACC
sibi$_i$] *suai* *uxoris* *dotem* *ambedisse*
REFL.DAT POSS.REFL.GEN wife.GEN dowry.ACC consume.PRF.INF
oppido].
altogether

'He$_i$ says that the goat that I had given to serve him$_i$, has eaten up the dowry of his wife completely.' (Pl. Mer. 238-239; Kühner and Stegman, 1976/1997a, p. 613)

b. *Caesar$_i$* *... duabus de causis Rhenum transire constituit,*
Caesar.NOM two for reasons Rhine.ACC cross.over.INF decided.IND
[quarum una erat [quod auxilia contra se$_i$
which.GEN.PL one.NOM was.IND because help.ACC against REFL.ACC
Treveris miserant]] ...
Treveri.DAT send.PST.PRF.IND

'Caesar$_i$ decided that he would cross the Rhine for two reasons, of which one was that they had sent help against him$_i$ to the Treveri.' (Caes. Gal. 6.9.1; Kühner and Stegman, 1976/1997a, p. 614)

In Jøhndal's syntactic account of long-distance binding, clauses which are not part of the reported content, should not contain LDRs. Consequently, he predicts that LDRs should be blocked in the indicative, provided that the indicative has the meaning contribution indicated above. Based on the grammatical literature, he suggests that indicative clauses occasionally are part of the reported content. In his opinion, the indicative clause in (173a) is part of what is reported, but he is less certain about (173b).

An explanation along these lines is less plausible for the following two examples, however:

(174)

[73]Pl. Mer. 238-239; Cic. Inv. 1.53; Cic. S.Rosc 2.6; Cic. Clu. 25; Sal. Jug. 88.4; Caes. Gal. 6.9.2; Caes. Civ. 3.53.5, Nep. Att. 25.16, and possibly Nep. Ep. 15.8. Note that (173b) and some of the other examples seem to involve clauses embedded within obligatory control complements. In all cases, however, the complement-taking verb has an attitudinal semantics.

a. … pro$_i$ *dixit* *[ab eodem$_j$ sibi$_i$ esse imperatum*
said.IND by same REFL.DAT be.INF command.PTCP.PRF.ACC
[ut pro$_i$ *[Aurium illum [qui sibi$_i$ delationem*
that Aurius.ACC that.ACC who.NOM REFL.DAT accusation.ACC
nominis et capitis periculum ostendarat], *et*
name.GEN and head.GEN danger.ACC showed.PST.PRF.IND and
alterum Aurium … proscribendos interficiendos=que]
other.ACC Aurius.ACC proscribe.GER.ACC.PL kill.GER.ACC.PL=and
curaret]].
undertake.PST.SBJV

'He$_i$ [i.e., Oppicianus] said that orders were given him$_i$ from the same person$_j$ [i.e., Sulla] that he$_i$ should make sure that that Aurius [who had threatened him$_i$ of criminal proceedings on a capital charge], as well as the other Aurius, were proscribed and killed.' (Cic. Clu. 25; Kühner and Stegman, 1976/1997a, p. 614)

b. *non enim Cicero$_i$ [ea solum [quae vivo se$_i$*
not only Cicero.NOM those.ACC alone which.NOM alive.ABL REFL.ABL
acciderunt], futura] praedixit, sed etiam, [[quae
happened.IND be.PTCP.FUT.ACC predicted.IND but also which.NOM
nunc usu veniunt]], cecinit ut vates.
now use.ABL come.IND foretold.IND like prophet.NOM

'Cicero did not only predict that those things would take place [which happened him$_i$ still being alive], but also, like a prophet, foretold those things which currently occur.' (Nep. Att. 25.16; Kühner and Stegman, 1976/1997a, p. 614)

(174a) is a highly complex example. The indicative relative clause containing the LDR is in a report embedded under three predicates with an attitudinal semantics. The LDR is bound by Oppicianus, the AH of the closest (as well as the highest) attitude verb. In the complement containing the indicative relative clause, it is talk of the proscription and killing of two people with the same name, Aulus Aurius. To distinguish the two, Cicero refers to the first as "that Aurius who..." and it is in the relative clause which follows that the LDR is found. It seems highly likely that this relative clause should not be interpreted as part of the attitudinal content, but more as an aid for the reader to keep track of the mentioned individuals.

In (174b), the LDR is in an absolute ablative construction in an indicative relative clause within indirect discourse. the relative clause should certainly not be interpreted in the attitudinal content of the predicate *praedixit* 'predicted'. Cicero's prophesy was surely not: "Those things will take place which happen while I am still alive." That would be a tautology, not a prophesy! The meaning here is rather that Cicero supposedly made a number of concrete and accurate predictions about the future, which the author, Cornelius Nepos, classifies into "things which happened Cicero still being alive" and "things which

currently occur".

Nothing stands in the way of the binding pattern in (174b) occurring in the current approach. Assume that some mechanism is added to the PCDRT semantics which makes it possible for conditions in the same DRS to hold in different worlds. The DRS in (175) is a DRS representation of the sentence. World abstractors are added to the abbreviated representation.

(175) $\lambda w.$

$e_1 x_1$
$cicero(x_1)$ $ag(e_1) = x_1$ $foretelling(e_1)(w)$ $content(e_1, \lambda w'$ [$e_2 x_2 \overline{x}_3$ | $PHolder_{reg}(x_2)$ $\partial(x_2 = x_1)$ $\partial(PHolder_{reg}(\mathcal{A}(x_3)))$ $occurs\_during\_lifetime(e_1, x_3)(w)$ $occurs(e_2)(w')$] $)$

$\mathcal{A} = \{\langle x_3, x_2 \rangle\}$

The anaphoric discourse referent x_3 occurs in a condition anchored to the matrix world, w, not in the attitudinal w'. Regardless of this modal anchoring, x_3 can pick up the $PHolder$ of the complement clause, x_2, as x_2 is in the accessibility path of x_3. This is possible because perspective shift and long-distance binding depend on the system of states and registers, and not directly on the modal semantics.[74]

5.6 LDRs and *de se* readings

In subsection 3.4.1, I looked at approaches to AH-referring elements in attitudinal environments based on a centred worlds semantics. Such accounts make a crucial prediction: The AH-referring element should have an obligatorily *de se* reading.

[74]For completeness, it should be mentioned that I am aware of one example of an LDR in an indicative clause in indirect discourse, which is not oriented towards the agent/experiencer of the attitudinal event, namely (176):

(176) *eum$_j$* *fecisse,* pro$_i$ *aiunt,* *[sibi$_j$* *quod* *faciendum* *fuit].*
him.ACC do.PRF.INF say.IND.3PL REFL.DAT what.NOM do.GER.NOM was.IND

'They$_i$ said that he$_j$ did what should be done by him$_j$.' (Pl. Poen. 955)

The LDR refers to the subject of the AcI embedded under the utterance predicate, and not the matrix subject. As we saw in section 2.5, there are infrequent instances of LDRs in Latin which are not attitudinal. I assume that (176) is an instance of non-attitudinal binding of some kind.

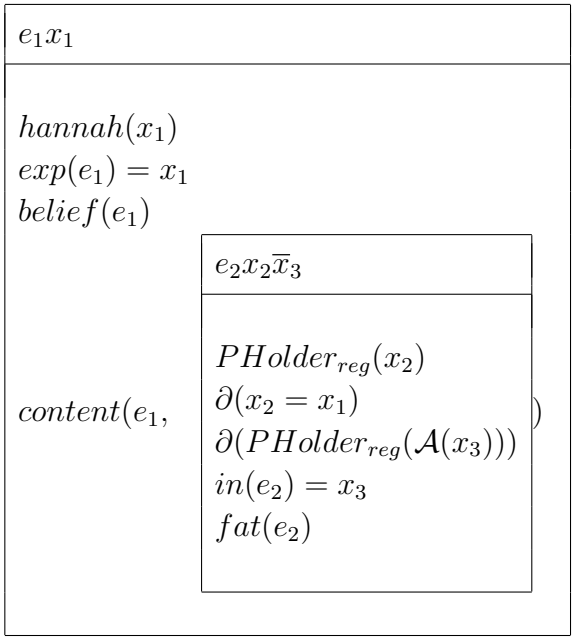
In my approach to perspective shifting and LDRs, AH reference is not explained in terms of centred worlds semantics. Rather than relying on a fine-grained semantics for indirect discourse, I have assumed that it involves (the PCDRT equivalent of) possible worlds propositions. Shifting to the AH obtains because the attitudinal event is represented in the complement. The crucial argument for doing perspective shift this way is that LDRs also exist in environments which cannot be analyzed in terms of attitudinal semantics, cf. chapter 3.

However, my approach does not in principle predict obligatorily *de se* readings. Let us quickly remind ourselves of the scenario given in subsection 3.4.1: The Welsh woman Hannah Philips visited a restaurant, saw herself in a mirror and thought "that person is fat". At first she didn't recognize that her thought was about herself, which prompted her to make mocking remarks. In other words, she had a *de re* belief about herself. Later, she realized that it was in fact herself she saw, and this *de se* belief resulted in her starting to run every other day. We can represent her belief with an LDR as follows:

(177) Hannah$_i$ believes that SE$_i$ is fat.

This sentence will have a representation somewhat like the following:

(178)



$, \mathcal{A} = \{\langle x_3, x_2\rangle\}$

The anaphoric register of the LDR, x_3, is resolved to the (shifted) $PHolder$, x_2, which is coreferent with x_1, Hannah, the experiencer of the belief event. This representation is compatible with both the *de se* and the *de re* readings: the antecedent register of the anaphor is inhabited by Hannah, but it may or may not represent the individual Hannah recognizes as herself in her belief. The modal semantics I assume for attitudinal complements is not fine-grained enough to make sense of this contrast.

LDRs in attitudinal environments have been claimed to have only a *de se* reading in several languages (Huang and Liu, 2001; Oshima, 2004, 2007; Charnavel, 2016). Oshima (2004, p. 182) presents a potential counter-example from Japanese, however:

(179) Context: Amnesic David, unknowingly reading his own biography, becomes fond of a female character, Mary. In a scene of the book, the hero of the book (David) saves her from death.

David$_i$-wa [zibun$_i$-ga Mary-o sukutte-kure-ta] to omotte-i-ru.
David-TOP REFL-NOM Mary-ACC save-BEN-PST QUOT believe-ASP-PRS

'David$_i$ believes that he$_i$ saved Mary.' (Japanese; example, glosses and translation according to Oshima (2004, ex. (10)))

This example is judged as true in the given context, where David does not know that the belief is about himself. It is crucial to note the presence of the benefactive marker *kure* on the subordinate verb: this marker can induce perspective shift also in non-attitudinal contexts. There are therefore two perspective-shifters, the belief verb and the benefactive marker. As Nishigauchi (2014, p. 173) points out with respect to this example, benefactive perspective shift does not entail any kind of awareness of the perspective holder, unlike attitudinal perspective shift. Because of this behavior outside of attitudinal environment, it is not entirely unexpected that the benefactive marker could lift a *de se* requirement on LDRs when it occurs within indirect discourse.

I have looked unsuccessfully for mistaken identity contexts occurring with indirect discourse in Latin corpora. Note, however, that the LDR in (180) (=(174a)) must be read *de re*. This example was discussed in subsection 5.5.2, where I argued that my theory predicted that LDRs could bind into indicative adjuncts in indirect discourse, and that (180) confirmed this prediction.

(180) *non enim Cicero$_i$ [ea solum [quae vivo se$_i$*
not only Cicero.NOM those.ACC alone which.NOM alive.ABL REFL.ABL
acciderunt], futura] praedixit, sed etiam, [[quae nunc
happened.IND be.PTCP.FUT.ACC predicted.IND but also which.NOM now
usu veniunt]], cecinit ut vates.
use.ABL come.IND foretold.IND like prophet.NOM

'Cicero did not only predict that those things would take place [which happened him$_i$ still being alive], but also, like a prophet, foretold those things which currently occur.' (Nep. Att. 25.16; Kühner and Stegman, 1976/1997a, p. 614)

As I have shown above, the relative clause *quae vivo se acciderunt* 'which happened him still being alive' cannot be interpreted within the attitudinal content at all. Therefore, a *de se* reading of the LDR cannot be constructed; it must be read *de re*.

Although the binding pattern in (180) is accounted for in the present analysis of attitudinal long-distance binding, an LDR in a mistaken identity scenario would be a less controversial example of the availability of *de se* readings. Like Japanese, Latin also has long-distance binding outside of attitudinal environments. As we lack a complete understanding of Latin non-attitudinal perspective shift, it is impossible to rule out the possibility that (180), like (179), involves some kind of non-attitudinal perspective shift.

Let us leave examples such as these aside and return to the claim in the literature that *de re* readings of LDRs are impossible in attitudinal contexts. The *de se/de re* distinction

is hard to elicit. Ewe logophors were taken to be obligatorily *de se* until Hazel Pearson's careful fieldwork revealed that *de re* readings where also possible (Pearson, 2015a). It is not impossible that the same is true for LDRs. If LDRs do in fact have an obligatorily *de se* reading in attitudinal environments, I see two possible ways to account for this. The first is to extend the event semantics of indirect discourse with a centred worlds semantics and add an additional requirement to the theory developed above, namely that the $PHolder$ discourse referent must be the center. This requirement would need to be independently motivated somehow.

The second option, which I find more plausible, is that obligatorily *de se* readings of LDRs in mistaken identity contexts are a byproduct of the processing of those contexts. Pearson (2015a, p. 98) says that in her experience, it is hard for many to detect *de re* readings of even ordinary personal pronouns in English: many find it hard to see that attitudes *de re* are about the AH in any meaningful sense. If perspective shift is about the external speaker's identification with a discourse participant, it might be quite difficult to shift the perspective in a mistaken identity scenario, since it appears to be hard to grasp that the indirect discourse is truly about the AH herself.

5.7 Some cross-linguistic considerations

I have so far focused primarily on Latin data. In this section, I will briefly look at some examples of LDRs in attitudinal complements in other languages, and see how the anaphoric approach to long-distance binding and the event approach to perspective shift can handle them. The considerations here are based on secondary literature and are therefore more tentative and suggestive.

LDRs in attitudinal environments can take non-subject antecedents in a number of languages. This was illustrated in section 2.7 by the examples in (30), repeated in (181):

(181)

a. *[Ziji$_i$-de xiaohai mei de jiang]-de xiaoxi shi Lisi$_i$ hen shangxin.*
REFL-GEN child not get price-DE news make Lisi very sad

'[The news that his$_i$ child didn't win the prize] made Lisi$_i$ very sad.' (Mandarin; example, glosses and translation according to Huang and Liu, 2001, ex. (35b))

b. *[Yosiko-ga zibun$_i$-o nikundeiru koto]-ga Mitiko$_i$-o zetuboo e oiyatta.*
Yosiko-SBJ REFL-OBJ be.hating COMP-SBJ Mitiko-OBJ desperation to drove

'[That Yosiko hated her$_i$] drove Mitiko$_i$ to desperation.' (Japanese; example, glosses and translation according to Sells, 1987, ex. (29))

c. *[Seetha tann-æ$_i$ verŭ-tt-aa[enbadŭ] Krishnan-æ$_i$ rombæ*
Seetha.NOM REFL-ACC hate-PST-3FSG that.NOM Krishnan-ACC very
kašʈappaɖŭtt-ij-adŭ.
bother-PST-3MSG

'[That Seetha hated him$_i$] bothered Krishnan$_i$ very much.' (Tamil; example, glosses and translation according to Sundaresan, 2012, ex. (30))

d. *Skoðun Siggu$_i$ er [að sig$_i$ vanti hæfileika].*
opinion Sigga.GEN$_i$ is that REFL lacks.SBJV ability

'Sigga$_i$'s opinion is [that she$_i$ lacks ability].' (Icelandic; example, glosses and translation according to Maling, 1984, ex. (23))

Examples (181a)-(181c) involve what Sundaresan (2012, sect. 3.1.3) calls *backwards binding* (a term adopted from Minkoff, 2003): the LDR is embedded within a clause in subject position, and the antecedent is a non-nominative argument of the same predicate. The argument structure pattern seen in these examples is typical for mental state predicates in a number of languages, which take the object of the mental state as subject and the experiencer as an oblique argument. These predicates are often called *psych-predicates* (Beletti and Rizzi, 1988). Exceptional antecedence patterns are observed both with local and long-distance binding with psych-predicates (see Sundaresan, 2012, 2.3.2.1, and references therein). Cases like these are challenging for purely structural accounts of long-distance binding, because the antecedent does not c-command the reflexive. They are relatively easy to account for in the present, event-based framework, however. The psych-predicate involves a mental state, and the perspective in the subject clause is shifted to the experiencer of that mental state.[75] (181d) involves a clausal complement to a nominal mental state predicate, and seems to be parallel to Latin examples we have seen in subsection 5.4.2 above.

Sundaresan (2012, sect. 3.2) discusses whether the antecedence condition for backward-bound LDRs in Tamil can be explained in terms of thematic roles, asking whether the antecedent is necessarily the experiencer of the psych-predicate. She puts forward the potential counter-example in (182):

(182) *[Taan$_{i/j}$ avva[avŭ eeɻæ-jaagæ irŭnd-adŭ] Raman-ooɖæ$_i$ aɳɳaav-æ$_j$*
REFL.NOM so poor-ADJ be-PST-3NSG.NOM Raman-GEN brother-ACC
rombæ-vee baadi-jirŭ-kkir-adŭ.
very-EMPH affect-be-PRS-3NSG

'[His$_{i/j}$ having been so poor] has really affected Raman$_i$'s brother$_j$.' (Tamil; example, glosses and translation according to Sundaresan, 2012, ex.s (33))

In this example *Raman's brother* is the matrix object, and both Raman and his brother can serve as LDR antecedent. As Sundaresan points out, Raman's brother is the experiencer

[75] The compositional semantics needs to be worked out in these examples, though. In particular, the clause containing the LDR is subordinate to a nominal subject translated as 'the news' in (181a), and the antecedent is part of a complex causative construction in (181b).

of the predicate here. Taken at face value, the possibility of Raman anteceding the LDR appears puzzling both to an account in terms of thematic roles, and indeed to the descriptive generalization that the LDR refers to the AH.

However, the genitive argument is allowed to be the antecedent only in very specific contexts. The pragmatically unmarked option is that Raman's brother is the LDR antecedent. In Sundaresan's words, Raman could serve as antecedent, e.g., if (182) "were part of an introspective series of thoughts and assertions" from Raman's point of view (Sundaresan, 2012, p. 44). In other words, this reading seems to require a context where the subject clause is in some way coerced to report a mental state of Raman's.

In Sundaresan's view, this shows that it is not the thematic roles assigned by the predicate which are relevant, but "the more general conceptual semantics associated with particular θ-roles" (Sundaresan, 2012, p. 44).[76] My account does rely on structurally assigned thematic roles, cf. subsection 4.6.3. However, (182) does not appear to me to be exceedingly problematic: the very peculiar kind of context needed for Raman to antecede the LDR might involve some kind of interpretation readjustment to accommodate the reading that the subject clause in some sense represents Raman's attitude. Also, it is not entirely clear to me specifically what Sundaresan means by an "introspective series of thoughts and assertions", but it might sound like a context where the entire sentence in (182) is part of some sort of report of Raman's words or thoughts. As we will see in more detail in the next chapter, indirect discourse does not always require syntactic embedding, and it might be that the context Sundaresan is alluding to can be analyzed as unembedded indirect discourse of this kind. If so, the ambiguity of the LDR in (182) could be treated on par with the ambiguity of LDRs in deeply embedded indirect discourse discussed earlier in this chapter. To establish whether an analysis of this kind is viable, it would of course be necessary to look more closely at the Tamil facts.

5.8 Generalizing to non-attitudinal contexts

5.8.1 The issue

If LDRs were restricted to attitudinal environments like the ones I have investigated above, it would have been possible to base the analysis entirely on the semantic properties of attitude reports. However, LDRs in certain languages are not limited to this environment. This is the case, e.g., in Japanese and Tamil (Kuno and Kaburaki, 1977; Oshima, 2007; Nishigauchi, 2014; Sundaresan, 2012), and at least to a certain extent, Latin. The so-called 'exempt' uses of reflexives in English and French are not limited to attitude reports either (see, e.g., Pollard and Sag, 1992; Reinhart and Reuland, 1993; Charnavel, 2016). A theory of long-distance binding should be equipped to account for LDRs both inside and outside of indirect discourse. To account for this wider distribution, it has been common in the literature to link LDR binding to perspective and perspective shift, as discussed, e.g., in section 2.7 and chapter 3. The motivation for choosing an event-based account of

[76] Sundaresan (2012, sect. 3.2) also discusses in this respect LDRs with discourse antecedent in multi-sentence indirect discourse in Tamil. As I will attempt to show in the next chapter, it is possible to capture similar examples in Latin on an event-based account.

perspective shift is specifically the possibility of generalizing it to new environments.

As we will see in the next subsection, non-attitudinal long-distance binding is too sparsely attested in Latin to get a good understanding of the phenomenon, or even to establish with certainty the connection to perspective shift. This dissertation is therefore not the right place for a detailed study of this kind of phenomenon, but in subsection 5.8.3 I will draw the outline of what an account might look like.

5.8.2 Latin LDRs in non-attitudinal environments

Here, I will investigate the attested examples of LDRs occurring outside of attitudinal environments in Latin, to try to determine whether they show sensitivity to perspective-shift. My main body of data on LDRs in non-attitudinal environments consists of examples collected from grammars, which I listed in an appendix to my Master's thesis (Solberg, 2011, p. 121). There are a couple of additional examples which might be non-attitudinal from Jøhndal (2012, sect. 4.5). I have been able to add one additional example to the list, (189), discussed below. The appendix to Solberg (2011) lists 66 examples, but 25 of them involve the possessive reflexive *suus* which is excluded from this study (cf. section 2.1). The remaining 41 examples are instances of *se* in indicative clauses or subjunctive clauses deemed to be non-reportive. Note, however, that a premise for this collection of examples is that the indicative normally should block the availability of LDRs. In particular, some of the examples involve indicative clauses within indirect discourse. As we saw in subsection 5.5.2, my theory does not predict blocking in such indicative clauses. Eight, possibly 9, of the 41 cases in the appendix to Solberg (2011) are therefore already accounted for in the current theory (see footnote 73 for the relevant references).

There have been a few previous attempts in the literature to give a perspectival account of these examples. Bertocchi (1989) suggests that empathy is relevant for the long-distance binding of *se*, with reference to Kuno and Kaburaki (1977) (cf. subsection 3.4.3 and subsection 3.4.6). The idea that perspective is relevant for Latin LDRs is developed further by Bertocchi (1994): in adjunct clauses in Latin, the subjunctive can sometimes replace the indicative to indicate that the clause represents the opinion of a discourse-internal individual (sometimes called the *oblique subjunctive*; see subsection 2.3.2). Bertocchi suggests that a long-distance bound reflexive has a similar function to the subjunctive; it indicates that the antecedent is committed to the truth of the proposition of the clause containing the reflexive. Sometimes, LDRs cooccur with an oblique subjunctive, as in (183a) (=(20)); in other instances, Bertocchi claims that the LDR itself holds this function, as in (183b) (Bertocchi, 1994, ex. (34) and (33a)).

(183)

a. *Decima legio$_i$ ... ei gratias egit [quod de*
tenth legion.NOM him.DAT thanks.ACC conducted.IND because about
se$_i$ optimum iudicium fecisset] ...
REFL.ABL excellent judgement.ACC make.PST.PRF.SBJV

'The tenth legion$_i$ thanked him because he had made such a favourable judgement of them$_i$.' (Caes. Gal. 1.41.2; Benedicto, 1991, ex. (5))

b. *Dexo$_i$ ... non [quae privatim sibi$_i$ eripuisti],*
Dexo.NOM not which.ACC in.private REFL.DAT snatch.away.PRF.IND.2SG
sed unicum ... abs te filium ... flagitat.
but unique.ACC from you son.ACC demands.IND

'Dexo$_i$ does not demand from you the things you took from him$_i$ in private, but solely his only son.' (Cic. Ver. 5.128; Kühner and Stegman, 1976/1997a, p. 613)

The relative clause in (183b) plausibly has something close to an indirect discourse interpretation due to the presence of the speech predicate *flagitat*, and there are other examples which can be treated similarly. However, other attested indicative clauses with LDRs do not show evidence of such an interpretation, so Bertocchi's suggestion goes somewhat beyond what we are able to test.

In my previous work (Solberg, 2011, 4.2.2) I tentatively suggested that LDRs in non-attitudinal environments in Latin were oriented towards the holder of the spatial perspective, following Sells' analysis of Japanese LDRs, but admitted that there was little independent evidence for a sensitivity to spatial perspective. Jøhndal (2012, sect. 4.5 and 4.6) also suggests that LDRs outside of indirect discourse might involve some kind of internal perspective, but points out that such an analysis is unconstrained and can easily be used to group together examples which do not fit with some theory of binding. Both Jøhndal (2012) and Solberg (2011) considered the perspectival binding in non-attitudinal environments as a binding mechanism separate from that of LDRs in indirect discourse, as the data did not fit our respective theories of long-distance binding in indirect discourse. As I made clear in subsection 3.4.3, I now find it unlikely that non-attitudinal long-distance binding should be an altogether different phenomenon from the attitudinal cases, as it is hard to understand why there should be three separate binding mechanisms for reflexives in a number of languages.

As Jøhndal correctly remarks, a perspectival story of Latin LDRs outside of indirect discourse does not make predictions which are easy to test in Latin, but there is one that can be tested to some extent: perspective-holding is generally considered to be restricted to sentient, animate individuals, cf. section 2.7 (see, e.g., Kuno, 1987, sect. 5.13 and passim; Sundaresan and Pearson, 2014; Charnavel, 2016). Therefore, a perspectival account is not compatible with LDRs with inanimate antecedents. I am aware of one example with an inanimate antecedent, but I think there are good reasons for not considering it a counter-argument to a perspectival account:

(184) *... sursum nitidae fruges arbusta=que crescunt, [pondera$_i$,*
upwards bright.NOM crops.NOM trees.NOM=and grow.IND weights.NOM
[quantum in se$_i$ est], cum deorsum cuncta ferantur].
as.much.as in REFL.ABL is.IND although downwards all.NOM bear.PASS.SBJV

'Bright crops and trees grow upwards [although all weights$_i$ push downwards [as far as it is in their$_i$ power]].' (Lucr. 2.189-190; Kühner and Stegman, 1976/1997a, p. 614)

In (184), the LDR is found in the clause *quantum in se est*. Five of the examples referred to in the appendix of Solberg (2011) involve the same clause, the only difference between them being the tense of the verb.[77] The meaning seems to be something like *as far as it is in their power*. Given the similarity of these examples, they are likely instances of an idiomatic expression rather than compositional constructions. Except for (184), there are no reported examples where long-distance bound *se* has an inanimate antecedent in Latin, which is consistent with the claim that LDRs are sensitive to perspective.

What further pattern can we find in the data? A good number of the examples seem to involve some kind of mental state or utterance interpretation, despite having indicative mood. (183b) is at least compatible with such an interpretation. In the examples in (185), this reading is even more plausible:

(185)

a. *Hannibalem*$_i$ *ante omnia angebat* *[quod Capua*
Hannibal.ACC before everything troubled.IND COMP Capua.NOM
pertinacius oppugnata ab Romanis quam
perseveringly.CPV attack.PTCP.PRF.NOM by Romans than
defensa ab se$_i$ *multorum Italiae populorum*
defend.PTCP.PRF.NOM by REFL.ABL many.GEN Italy.GEN states.GEN
animos averterat] *...*
minds.ACC turn.away.PST.PRF.IND

'[The fact] that Capua, which was more perseveringly attacked by the Romans than defended by him$_i$, had turned the regard of many of the states of Italy away [from him], troubled Hannibal$_i$ more than anything.' (Liv. 26.39.1; Kühner and Stegman, 1976/1997a, p. 614)

b. *Caesar*$_i$ *... omnibus [qui contra se*$_i$ *arma*
Caesar.NOM everyone.DAT who.NOM against REFL.ACC arms.ACC
tulerant], *ignovit ...*
bear.PST.PRF.IND forgave.IND

'Caesar$_i$ forgave everyone who had borne arms against him$_i$.' (Vell. 2.56.1; Kühner and Stegman, 1976/1997a, p. 614)

In (185a), the subject to *angebat* 'troubled' is an indicative clause. The LDR in the indicative clause refers to the experiencer of the trouble, which with this predicate is realized as an accusative.[78] *Angebat* is quite clearly a mental state predicate, so an LDR is expected to be possible here. This example is presumably mentioned as exceptional in grammars because an indicative is assumed to be a blocker for long-distance binding. The binding pattern in (185b) is more unexpected, as the LDR occurs in an indicative relative clause. Note, however, that the verb of this sentence is *ignovit* 'forgave', and that the

[77] Liv. 2.43.6, Nep. Iph 3.4, Lucr. 2.190, Sen. Ben. 6.11.2 and 7.15.3. In addition, there is a 6th example with *quod in se fuit*, Cic. Q. Rosc. 39.

[78] A similar example with the same predicate is found in Liv. 39.23.6.

relative clause expresses what Caesar forgave. In other words, the interpretation of it is very close to indirect discourse, and it is not unlikely that such examples can be captured by the account presented previously in this chapter.[79]

Other examples do not show evidence of any attitudinal interpretation, such as the one in (187) (=(26c)):

(187) *... Epaminondas$_i$ ... ei [qui sibi$_i$ ex lege praetor*
Epaminondas.NOM him.DAT who.NOM REFL.DAT from law praetor.NOM
successerat] exercitum non tradidit ...
succeed.PST.PRF.IND army.ACC not transfered.IND

'Epaminondas$_i$ did not transfer the army to the one who had succeeded him$_i$ as a praetor according to the law.' (Cic. inv. 1.55; Kühner and Stegman, 1976/1997a, p. 613)

Previously (Solberg, 2011, p. 102-103) I speculated that the verb used in the relative clause, *succedo* 'succeed', induces a shift in the spatial perspective to the dative argument. The verb is composed of the prefix *sub* 'under, behind' and *cedo* 'go', and draws on the metaphor of the subject walking behind the indirect object. I suggested that this metaphorical spatial ordering might affect the spatial perspective. As we have seen in section 2.7 and subsection 3.4.3, the clausemate verb can influence the perspective in Japanese, and it is not impossible that something similar takes place in Latin too. There is, however, no way of testing this suggestion for Latin as far as I can see.

One case of non-attitudinal long-distance binding in Latin seems to me to be particularly interesting, namely the case of verbs of deserving. The following example has been reported in the literature (=(3)):

[79]It is interesting to note in connection with this that Mandarin sometimes allows LDRs in relative clauses and adverbial clauses, although LDRs are normally not allowed outside of attitudinal environments in that language. However, the antecedent has to be conscious of the event of the clause containing the reflexive, as the following contrast shows (Huang and Liu, 2001, sect. 3.2.3):

(186) a. *Zhangsan$_i$ kuajiang-le [changchang piping ziji$_i$ de] naxie ren.*
Zhangsan praise-PRF often criticize REFL DE those persons

'Zhangsan$_i$ praised those people who criticized him$_i$ a lot.'

b. ?? *Zhangsan$_i$ kuajiang-le [houlai sha si ziji$_i$ de] naxie ren.*
Zhangsan praise-PRF later kill die REFL DE those persons

'Zhangsan$_i$ praised those people who later killed him$_i$.' (Mandarin; examples, glosses, judgements and translations according to Huang and Liu, 2001, ex.s (43a) and (43b))

We may speculate that something similar is going on in (185b).

(188) *unum hoc scio, [hanc$_i$ meritam esse*
only.ACC this.ACC know.PRS.IND.1SG she.ACC deserve.PTCP.PRF.ACC.F be.INF
[ut memor esses sui$_i$]]
that mindful.NOM be.SBJV.2SG REFL.GEN

'I know only this, that she$_i$ has deserved that you remember her$_i$.' (Ter. Andr. 281; Kühner and Stegman, 1976/1997a, p. 613)

Mereor 'deserve' resembles an attitude predicate in that it has a modal interpretation, and it also employs the *ut/ne* complementizer and has subjunctive mood, like many attitude predicates. However, it does not have an indirect discourse interpretation: deserving is clearly not a mental state of the subject.

I have checked all examples in Latin of verbs meaning 'deserve' with finite complements, to see if there are examples beyond (188). I found one more, (189):

(189) *ego autem tibi hoc confirmo, [esse neminem ... a*
I.NOM but you.DAT this.ACC confirm.IND.1SG be.INF nobody.ACC from
quo non facile ... impetrare possis [ut pro$_i$ *suo*
whom not easily obtain.INF can.SBJV.2SG that POSS.REF.ABL
beneficio promereatur [se$_i$ ut ames] et [sibi$_i$ ut
favor.ABL deserve.SBJV REFL.ACC that love.SBJV.2SG and REFL.DAT that
debeas]]] ...
owe.SBJV.2SG

'I can assure you, there is no one from whom you cannot obtain that he$_i$, through his favors [towards you], deserves that you love him$_i$ and is indebted to him$_i$.' (Q.Cic. Pet. 26)

In this highly complex example, two LDRs are found in coordinated complements to the verb *promereor* 'deserve'. The deserve predicate itself is embedded under two attitudinal complement-taking predicates, but note that the antecedent of the LDRs is the AH of neither of them, so standard attitudinal long-distance binding in indirect discourse is ruled out.

(188) and (189) admittedly form a very limited data set. It is not without significance, however, that these two examples are the only instances of any kind that I have been able to find where a pronoun in a complement to a verb of deserving is coreferent with the subject of the deserve predicate. It does seem likely that verbs of deserving act as perspective shifters despite not having an attitudinal semantics. Note also that this predicate has a benefactive semantics, which is known to trigger perspective shift in some languages (see e.g. Nishigauchi, 2014; Charnavel, 2016).

We have seen in this section that the cases of long-distance binding outside of indirect discourse in Latin are consistent with a perspective account, although it cannot be shown conclusively that perspective is the determining factor. Such an account seems reasonable, given the use of LDRs in indirect discourse and the fact that perspective seems to be relevant for long-distance binding cross-linguistically. Under the assumption that all Latin

LDRs are perspectival, verbs of deserving are especially interesting, since they appear to act as perspective shifters without having an attitudinal semantics.

5.8.3 A draft of an analysis

The Latin data presented above is not coherent enough for a full formal analysis. Instead, I will attempt to draft an analysis of long-distance binding with *mereor*, to show how the event approach can be generalized to non-attitudinal environments.

Note that verbs of deserving, while not being attitude verbs, have a lot in common with attitudinal verbs. One major point of similarity is that they both have a modal semantics. *Mary deserves that we take care of her* presumably involves quantification over worlds compatible with what Mary deserves. Verbs of deserving also take complement clauses. In Latin, they take both infinitival control complements and subjunctive clauses with the complementizers *ut* or *ne*. What distinguishes them from attitudinal verbs is the lack of a mental state or an utterance interpretation: a complement to *deserve* does not report on the content of an utterance or mental state of the subject. The subject does not need to be aware of her state of deserving. In subsection 5.2.2, I argued that the type of event involved in indirect discourse has two core characteristics: it is contentful, which accounts for the modal interpretation of the complement, and it is associated with an agent or an experiencer. Deserving states are presumably contentful, as the complement has a modal interpretation; however, the subject is not an agent/experiencer.

To illustrate how non-attitudinal perspective shift can be modelled, I will assume that the semantics of *mereor* 'deserve' can be formalized in a fashion exactly parallel to that of attitude verbs, cf. subsection 5.3.2. Note, however, that this formalization is not based on a detailed study of the semantics of verbs of this kind, and that certain aspects of the formalization might look different in a more complete account.

Like other verbs, *mereor* only introduces an event description to an event variable. Since *deserve* is associated with a modal semantics, I take the event to be contentful.

(190) $[[mereor]]^{M,a} = \lambda e.$ $\boxed{\begin{array}{|l} \\ \hline deserving(e) \\ \\ \hline \end{array}}$

I assume that the subject of *mereor* is assigned the thematic role *benefactive*. The verb also combines with a clausal complement. As in attitudinal complements, the complementizer to *deserve* is responsible for the modal interpretation of the complement. It also induces perspective shift, but the perspective is shifted to the benefactive rather than the agent/experiencer. I call the complementizer $C_{P-shift-ben}$:

(191) **Denotation of $C_{P-shift-ben}$:**

$$[[C_{p-shift-ben}]]^{M,a} = \lambda K.\lambda V.\lambda e.$$

$$\begin{array}{|l|}\hline \\ \hline content(e, (\quad \begin{array}{|l|}\hline x_1 \\ \hline PHolder_{reg}(x_1) \\ \partial(x_1 = \imath x.ben(e) = x) \\ \\ \hline \end{array} \quad ; K)) \\ \hline \end{array} \; ; V(e)$$

$C_{P-shift-ben}$ is similar to $C_{P-shift}$, the complementizer for attitudinal complements introduced in (136), except for the identity condition for the $PHolder$ register. Instead of identifying x_1 with the agent/experiencer of the contentful event, the register is identified with the benefactive of the contentful event.

(192) is based on the example with LDRs in the complement to *mereor* in (3):

(192) Mary$_i$ deserves that John remembers SE$_i$.

Given the assumptions about the semantics of *mereor*, we can represent the semantics of (192) without altering the semantics of the LDR (the denotation of the LDR is given in (135)):

(193)

$$\begin{array}{|l|}\hline e_1x_1x_2 \\ \hline \\ mary(x_1) \\ john(x_2) \\ ben(e_1) = x_1 \\ deserving(e_1) \\ \\ content(e_1, \quad \begin{array}{|l|}\hline e_2x_3\overline{x}_4 \\ \hline \\ PHolder_{reg}(x_3) \\ \partial(x_3 = x_1) \\ \partial(PHolder_{reg}(\mathcal{A}(x_4))) \\ exp(e_2) = x_2 \\ theme(e_2) = x_4 \\ remembering(e_2) \\ \\ \hline \end{array} \quad) \\ \hline \end{array}$$

$$\mathcal{A} = \{\langle x_4, x_3\rangle\}$$

The inhabitant of the $PHolder$ register x_3 of the complement clause is equal to the benefactive of the deserving event, i.e., x_1 (cf. the denotation of the complementizer in (191)). In this way, we ensure that the LDR picks up the benefactive as an antecedent.

Comparing this analysis to the analysis of LDRs in attitudinal complements in chapter 5 illustrates an important advantage of the event approach to perspective shift. The *PHolder* register is inhabited by an individual with a specific thematic relationship to the event of the perspective shifter. By altering which thematic role is relevant, we can represent different kinds of perspective shift within the same general semantic framework. There is therefore no need to give a special treatment to perspective shift or perspectival anaphora outside of indirect discourse.

While this analysis captures the referential behavior of LDRs in complements to verbs of deserving, it does not answer the deeper question of why perspective shift takes place specifically in that environment, as well as in certain other non-attitudinal environments. Based on the limited Latin data, it is almost impossible to say anything about this beyond pure speculation. I suggested in subsection 5.3.5 that the perspective is shifted in indirect discourse because representing someone's mind also involves adopting there physical perspective. It might be that a similar adoption of perspective takes place when the speaker shows sympathy with a discourse-internal participant, e.g., by asserting this participant deserves something.[80]

There are cases of non-attitudinal long-distance binding which are not as easy to account for in the present theory. In particular, some of the cases of long-distance binding in Japanese do not appear to involve DRS subordination, unlike attitude predicates and verbs of deserving. DRS subordination is crucial in the current theory, since the domain of the perspective shift is given by anaphoric accessibility. If no subordination is involved, we risk that the *PHolder* register is assigned in the matrix DRS, making it accessible in the entire subsequent discourse.

One concrete case is LDRs with the Japanese verb *kureru*, discussed above in sections 2.7 and 3.4.3. As we saw there, both *yaru* and *kureru* mean 'give', but they differ in their perspective-shifting behavior, as (194) (=(33)) illustrates.

(194)

a. *Taroo$_i$-wa [Hanako-ga zibun$_i$-ni kasite* kureta*] okane-o tukatte*
Taroo-TOP Hanako-NOM REFL-DAT lending gave money-ACC spending
simatta.
ended.up

'Taroo$_i$ has spent all the money [that Hanako had lent him$_i$].'

b. **Taroo$_i$-wa [Hanako-ga zibun$_i$-ni kasite* yatta*] okane-o tukatte*
Taroo-TOP Hanako-NOM REFL-DAT lending gave money-ACC spending
simatta.
ended.up

'Taroo$_i$ has spent all the money [that Hanako had lent him$_i$].' (Japanese; examples, glosses, judgements and translation according to Kuno and Kaburaki, 1977, ex. (30) a and b)

[80] Charnavel (2016) suggests an explanation along these lines for French data.

When *kureru* is used, as in (194a), it shifts the perspective to its dative argument, and an LDR can therefore occupy that position. With *yaru*, on the other hand, the speaker or subject holds the perspective, and a dative LDR is therefore not licit, as in (194b). The important point here is that *kureru* is not a modal predicate or a creator of DRS embedding in any other way. It is therefore not obvious how to constrain accessibility.[81]

There is, however, a further restriction on examples like (194): this binding pattern is apparently only seen when *kureru* is used in a subordinate clause, and the antecedent of the LDR must be the superordinate subject, or if there is no animate subject, the antecedent must be a thematically prominent argument in the superordinate clause (Oshima, 2004, 2007). Something beyond perspective shift by the giving verb appears to be involved in examples like this, as it is difficult to see how the perspective shift alone could account for the subordinate clause restrictions and the antecedents of such LDRs. An appropriate analysis requires a detailed study of the Japanese facts.

5.9 Concluding remarks

This chapter has presented the core of my account, the analysis of LDRs with sentence-internal antecedents. In section 3.5 I said that there was a tension between two of the desiderata for a semantic theory of LDRs: According to desideratum DES1, the theory should account for the AH-reference of LDRs, while DES4 specifies that it should be possible to extend the theory in a plausible way to non-attitudinal environments.

I have tried to fulfil both these requirements by analyzing perspective shift in terms of thematic roles. In attitudinal complements, the perspective is shifted to the agent of the selecting predicate, if it is an utterance predicate, or the experiencer, if it is a mental state predicate. In this way, I am able to model shift to the AH, the individual whose words or thoughts are reported, regardless of syntactic position. There are other ways of obtaining this. In particular, it is possible to use some version of centred worlds semantics, as (e.g.) Huang and Liu (2001) do. The advantage of using events and thematic roles instead is that it is possible to model other kinds of perspective shift using the same framework.

As we saw in subsection 3.4.5, Sells (1987) also proposes a unified treatment of LDRs and perspective shift inside and outside of attitudinal environments. However, his analysis is uninterpreted, and it draws on primitive discourse roles. The present account is embedded in the fully interpreted semantic framework developed in chapter 4, and models perspective shift using only machinery which has a clear independent motivation: events and thematic roles.

The LDR itself has been argued to be an anaphor with presuppositional restrictions to perspective holders. In contrast to several of the previous analyses of LDRs, the relationship between the pronoun and the antecedent is not structural, but entirely semantic. This makes it possible to model the ambiguity of LDRs embedded under multiple attitude predicates without resorting to structural ambiguities, unlike movement approaches such as that of Huang and Liu (2001). The restrictions on possible antecedents are due to presuppositional restrictions on the anaphoric pronoun and anaphoric accessibility. In

[81] Similar difficulties probably arise in Latin cases such as (187).

other words, they are also entirely semantic in nature.

In this chapter, the advantages of a dynamic semantics have not been fully exploited. This will change in the next chapter, where I account for LDRs with discourse antecedents.

Chapter 6

LDRs with discourse antecedents

6.1 Introduction

In the previous chapter I presented a PCDRT account of long-distance binding in attitudinal complements. As we saw in subsection 2.3.3, indirect discourse can be extended beyond the sentence in Latin, e.g., when a long discourse is reported. Such long stretches of indirect discourse can contain LDRs referring to the reported speaker, mentioned several sentences before. In this chapter, I will extend the theory of indirect discourse and perspective shift to account for these facts.

In section 6.2 I look more closely at the phenomenon of multi-sentence indirect discourse in Latin and LDRs with cross-sentential antecedents. Section 6.3 discusses previous DRT approaches to this kind of indirect discourse and proposes an event-based PCDRT implementation. Perspective shift and perspective anaphora are integrated into this account in section 6.4. In section 6.5 I present a particularly complex case of multi-sentence indirect discourse, and suggest ways to account for it. Section 6.6 discusses some cross-linguistic data before some concluding remarks in section 6.7.

6.2 Cross-sentential LDRs in Latin

Bary and Maier (2014) coined the term *unembedded indirect discourse* (UID) for a construction in Ancient Greek similar to Latin multi-sentence indirect discourse. In Latin, the sentences constituting an UID are either AcIs or subjunctive clauses, and they frequently contain LDRs. (195) is an example of the first part of a passage of UID:

(195) *Ad haec Ariovistus$_i$ respondit [ius esse belli ut*
to these Ariovistus.NOM answered.IND law.ACC be.INF war.GEN that
qui vicissent iis quos vicissent
who.NOM conquer.PRF.PST.SBJV them.DAT whom.ACC conquer.PRF.PST.SBJV
quem ad modum vellent imperarent]. Item populum
which.ACC to manner.ACC wanted.SBJV ruled.SBJV likewise people.ACC
Romanum victis non ad alterius praescriptum, sed ad
Roman conquered.DAT not to another.GEN rule.ACC but to
suum arbitrium imperare consuesse. Si ipse
POSS.REFL.ACC judgement.ACC rule.INF be.used.to.INF if PROX.NOM
populo Romano non praescriberet quem ad modum
people.DAT Roman not ordered.SBJV which.ACC to manner.ACC
suo iure uteretur, non oportere se$_i$ a populo
POSS.REFL.ABL right.ABL used.SBJV not be.right.INF REFL.ACC by people
Romano in suo iure impediri.
Roman in POSS.REFL.ABL right.ABL hinder.PASS.INF

'To this Ariovistus$_i$ answered [that it was according to the laws of war that the conquerors ruled over those they had conquered in the way they wanted]. Likewise, the Roman people usually decided over those whom they had conquered, not according to the rule of others, but according to their own judgement. If he himself did not decide for the Roman people how they should exercise their right, it was not right that he$_i$ should be hindered by the Roman people in the exercise of his right.' (Caes. Gal. 1.36.1-2)

The first sentence has an attitude verb and an attitudinal complement, marked here by square brackets. The subsequent sentences are AcIs and are interpreted as part of the indirect discourse. The LDR in the last sentence is bound by the subject of the report predicate in the initial sentence. In subsequent examples, I will not always give continuous passages of UID, as in (195), but I will often mark omitted sentences with an ellipsis.

Bary and Maier (2014) argue against two potential treatments of Ancient Greek UID. The first (Bary and Maier, 2014, p. 80-83) is that UID is the same phenomenon as the narrative style called *free indirect discourse* (FID) (Banfield, 1982; Eckhardt, 2014), often illustrated by the following example:

(196) Tomorrow was Monday. Monday, the beginning of another school-week! (D.H. Lawrence. Women in Love. Chapter 15)

Like UID, FID reports on a protagonist's speech or thought; it is not syntactically embedded, and pronouns and tenses are third person. However, other indexical expressions (e.g., *tomorrow*) are shifted to the protagonist in FID, while indexicals are consistently speaker-oriented in UID both in Ancient Greek and Latin. Also, FID can contain exclamatives such as *hurray*, which does not seem to be possible in UID in Ancient Greek, and as far as I am aware, nor in Latin.

The other analysis Bary and Maier (2014, fn. 7) argue against is a syntactic embedding analysis, as sentences of UID can have initial particles which are only possible in the beginning of main clauses in Ancient Greek. Haug et al. (2017) have argued further against a syntactic analysis of UID, based on Latin data. Haug et al. (2017) identify two potential syntactic analyses, both of which I will show to be inadequate. The first is to treat the sentences constituting a passage of UID as coordinated complements to an initial complement-taking predicate. This analysis is ruled out, as it is not always the case that the whole UID can be interpreted as a complement to the first verb. In (197) (=(18b)), only the complement to *negavit* 'denied' is denied by the subject. The rest is positively asserted:

(197) pro$_i$ *reddi* *captivos* *negavit* *esse* *utile;* *illos*
return.INF prisoners.ACC denied.IND be.INF useful they.ACC
enim *adulescentes* *esse* *et* *bonos* *duces,* *se$_i$* *iam*
for young.ACC be.INF and good officers.ACC REFL.ACC already
confectum *senectute.*
consume.PTCP.PRF.ACC age.ABL

'He$_i$ denied that it would be expedient to return the prisoners; for, he said, they are young and good officers, while he$_i$ was already consumed with age.' (Cic. Off. 3.100; ex. and translation due to Haug et al., 2017, ex. (2))

In some cases, there is no complement-taking predicate in the introductory sentence at all, as in (198) (=(16b)):

(198) pro$_i$ ... *sese* *omnes* *flentes* *Caesari* *ad* *pedes*
REFL.ACC all.NOM cry.PTCP.PRS.NOM.PL Caesar.DAT to feet
proiecerunt: Non minus *se$_i$* *id* *contendere* *et* *laborare* *ne*
threw not less REFL.ACC it.ACC strive.INF and work.INF that.not
ea *quae* *dixissent,* *enuntiarentur,* *quam* *uti* *ea*
those.NOM which.ACC said.SBJV reveal.PST.PASS.SBJV than that those.ACC
quae *vellent,* *impetrarent* ...
which.ACC wanted.SBJV obtained.SBJV

'Crying, they$_i$ threw themselves at Caesar's feet: They$_i$ strived and worked no less for securing that those things which they had said, would not be revealed, than for obtaining the things they wanted.' (Caes. Gal. 1.31.2)

In (198), the reader must infer that the prostration and crying is accompanied by an utterance.

The second potential analysis is that the seemingly independent sentences in UID are complements to covert utterance predicates. An analysis along these lines makes wrong predictions for discourse relations within the UID. In particular, the discourse particle *enim* 'for', which is used in the second sentence in (198), establishes causal relations between parts of the discourse. It always takes the highest scope in a sentence. We

illustrate the normal behavior of *enim* with the following example (originally from Kroon, 1995, p. 137):

(199) *iam eum, ut puto, videbo; misit enim puerum ...*
now him.ACC as think.IND.1SG see.IND.FUT.1SG sent.IND for boy.ACC

'I will see him, I think. For he has sent a boy...' (Cic. Att. 10.6.5; Haug et al., 2017, ex. (6))

Enim indicates that there is a causal relationship between the sending of the boy and the seeing.

(199) is contrasted with (200), where *enim* occurs in a sentence with an overt utterance predicate and an AcI:

(200) *periucundus mihi Cincius fuit a. d. III Kal. Febr. ante lucem;*
very.welcome me.DAT Cincius.NOM was February 28 before light
dixit enim mihi [te esse in Italia ...]
said.IND for me.DAT you.ACC be.INF in Italy

'Cincius was a very welcome arrival (before daybreak, 28 January), for he told me that you [=Atticus] were in Italy ...' (Cic. Att. 4.4.1; example and translation according to Haug et al., 2017, ex. (8))

Enim in (200), and in other similar examples, relates the saying event to the event of the preceding sentence, and crucially not the event of the AcI embedded under the speech verb. In other words, *enim* scopes over the entire sentence. If we assume empty speech verbs in UID, the prediction would therefore be that *enim* relates the event of that empty verb to the preceding discourse. This is not what we see in (197) and similar sentences, however: *enim* establishes a causal relation within the indirect discourse in the same way as in non-reported main clauses. Haug et al. (2017) therefore conclude that, despite the use of non-finite forms such as AcIs in UID, the sentences constituting the UID must be independent main clauses.

Something needs to be said about the AcI/subjunctive alternation in UID in Latin. As we saw in subsection 5.4.1, some attitude predicates take subjunctive complements with the complementizers *ut/ne* and others take AcI complements, but the predicates that take one or the other kind of complement do not seem to fall into consistent semantic classes. In UID, however, the distinction is more clearly semantic: AcIs correspond to asserted indicative clauses, while subjunctive clauses with *ut/ne* correspond to imperatives or expressions of a wish etc. (Menge, 2000, § 470), as in (201):[82]

[82]The binding antecedence pattern seen in (201) will be treated in subsection 7.2.3.

(201) *... Ariovistus$_i$ ad Caesarem legatos mittit: Velle se$_i$*
Ariovistus.NOM to Caesar messengers.ACC sends.IND want.INF REFL.ACC
de his rebus ... agere cum eo: uti ... iterum colloquio
about these things talk.INF with him that again meeting.DAT
diem constitueret ...
day.ACC decide.SBJV

'Ariovistus$_i$ sends messengers to Caesar: he$_i$ wanted to talk about these things with him. Caesar should again find a date for a meeting.' (Caes. Gal. 1.47.1; Menge, 2000, p. 565)

The first sentence of the UID in (201) is an AcI, and would presumably be expressed as an indicative sentence in direct speech: "I want to ...". The second sentence is a subjunctive, and corresponds to an imperative speech act: "Find a new date for a meeting!"

My task in the following sections is to work out an account of UID which conforms to the semantic assumptions in this dissertation, and pair this account with the analysis of LDRs developed in the previous chapter, to explain the behavior of LDRs in UID. LDRs taking extra-sentential antecedents in longer stretches of reports are attested, e.g., in Icelandic, Tamil and Chinese (cf. section 6.6), and logophoric pronouns in Ewe also show a similar behavior (Clements, 1975). While there have been some attempts at extending analyses of LDRs in complements to cross-sentential indirect speech, e.g., by Sundaresan (2012), as explained in subsection 3.4.4, no accounts have to my knowledge been paired with a proper semantic analysis of UID. I will try to fill this gap.

6.3 Acccounting for UID

6.3.1 Previous DRT accounts of UID

Background

The important question a semantic analysis of UID should answer is how main clauses with report morphology and without overt utterance predicates can be interpreted as indirect discourse. Fabricius-Hansen and Sæbø (2004) have attempted to answer this question for the report subjunctive in German, and Bary and Maier (2014) draw on that account in their analysis of report morphology in Ancient Greek.

Like Latin AcIs and subjunctives, the German report subjunctive is found both in complements to utterance predicates and in independent main clauses, where it signals the continuation of indirect speech. When a speech situation can be inferred from the context, the report subjunctive can occur without an overt speech verb. Ancient Greek has a use of report morphology similar to what is seen in German and Latin, but in Greek, reports are marked as either AcIs or finite clauses in the optative mood (Bary and Maier, 2014).

Fabricius-Hansen and Sæbø (2004) develop an analysis according to which the German report subjunctive is associated with a *reportive presupposition*, a presupposition that the proposition represents someone's utterance. This analysis is framed within DRT, drawing

on the anaphoric account of presupposition of van der Sandt (1992). Bary and Maier (2014) draw on Fabricius-Hansen and Sæbø's analysis in many respects, but improve some technical details and adapt it to the Greek data. To understand the accounts of report presuppositions as well as my own account below, it is necessary to give a brief overview of van der Sandt's theory of presupposition.

Presupposition as anaphora

Van der Sandt argues that complex presuppositional expressions such as definite descriptions can be treated on par with anaphors, i.e., as constituents which need to be resolved to an antecedent in the textual context. The difference is that presuppositional expressions have more descriptive content that anaphors typically do, and they can have internal structure.

Presuppositions are typically not cancelled by embedding under logical operators. In (202a), the presupposition that Jack has children is preserved, even though the definite description is embedded within a conditional structure. However, in (202b) the presupposition is cancelled.

(202)

a. If it rains on Sunday, John's children will be unhappy.

b. If John has children, John's children are bald (based on van der Sandt, 1992, ex. (1b))

(202b) can be true or false if John is childless, while we have a presupposition failure in (202a) if John does not have children.

This puzzle gets a natural explanation if definite descriptions are treated as anaphors: *John's children* in (202b) is bound by the indefinite *children* in the conditional antecedent, while it is bound to an antecedent in the preceding discourse or an antecedent is accommodated in (202a) (van der Sandt, 1992, p. 342-343)

Van der Sandt extends Classical DRT by adding a possibly empty set of presuppositional DRSs to every DRS:

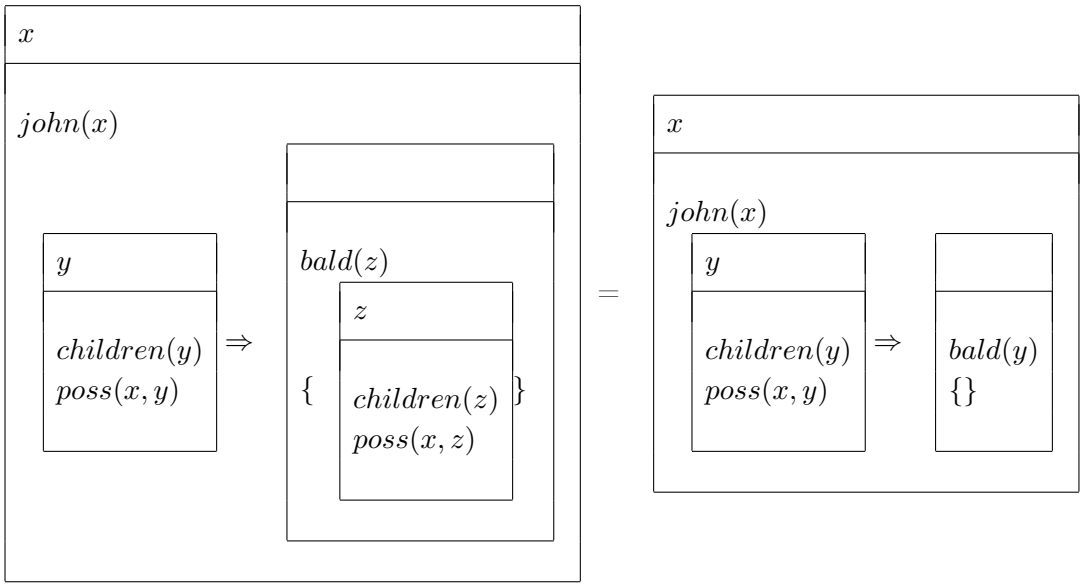
(203) a. John's children are bald.

b.

y
$john(y)$ $bald(x)$ { | x | $children(x)$ $poss(y, x)$ | }

The presuppositional DRS (written between curly brackets in (203)) does not itself have a model-theoretic interpretation.[83] Instead, it must be resolved to an antecedent after the DRS containing it is merged with the context DRS, but before further DRSs are merged in. In cases like (202b), where there is an accessible antecedent, the presupposition can be resolved by binding. The presuppositions are removed, and the discourse referents from the presuppositions are replaced by the antecedents' discourse referents:

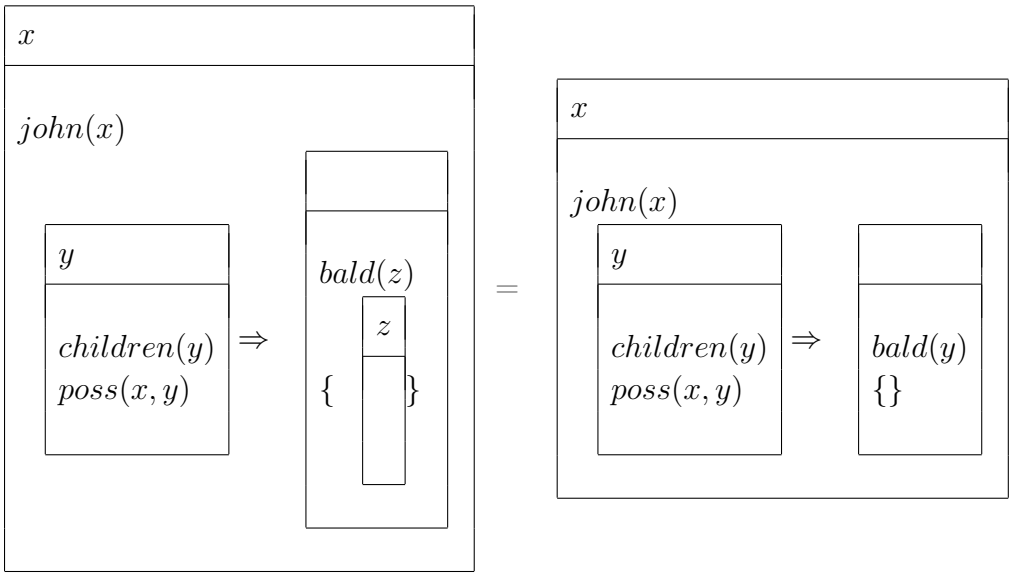
(204)



The exact same mechanism is used for pronominal anaphoric binding. The only difference is that pronominal anaphors have very little descriptive content or structure of their own:

(205) a. If John has children$_i$, they$_i$ are bald.

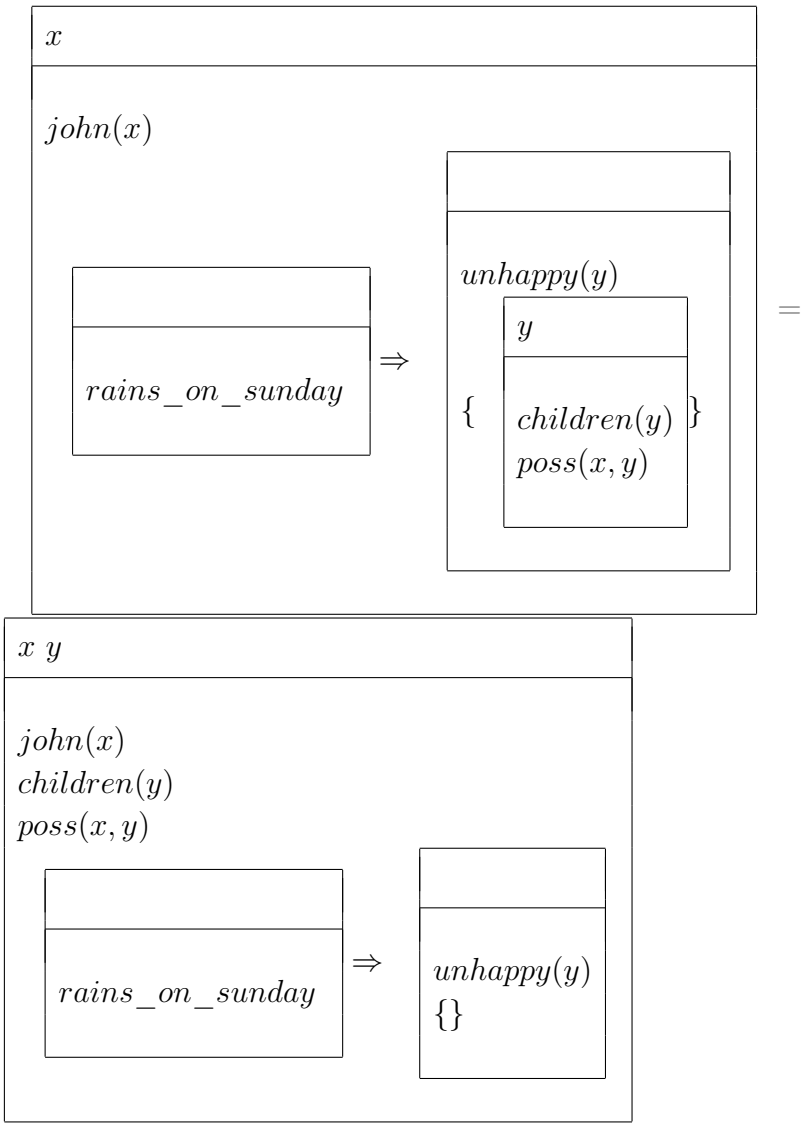
b.



[83] In van der Sandt (1992), names are treated as presuppositional expressions too, but I omit this detail here.

But what happens in cases like (202a), assuming that there is no previous mention of any children of John in the previous discourse? In such cases, an antecedent is accommodated. The context is remedied by adding appropriate discourse referents and conditions, to which the presuppositions are resolved:

(206)



Note that it holds in the main DRS of (206) that John has children, while it does not in (204), which accounts for the contrast in the presuppositional behavior noted above.

Accommodation is usually only possible for presuppositions, not pronominal anaphors. The reason for this, in van der Sandt's view, is that a certain amount of descriptive content is needed to be able to accommodate a suitable discourse referent when the context does not make one available. Complex presuppositional expressions, unlike pronominal anaphors, have the content needed to accommodate an antecedent when the context does not provide one.

Modelling reportive presuppositions

Let us return to the presupposition-as-anaphora account of reportive presuppositions. I will focus on Bary and Maier's version of the theory, but the account of Fabricius-Hansen

and Sæbø (2004) is in most respects similar.

Bary and Maier (2014) primarily analyze optative-marked reports in Ancient Greek, and extended their account to AcIs at the end of the paper. The optative can, like the German subjunctive, be used both in complement reports to (declarative) speech predicates and in UID, and Bary and Maier give a uniform account of the optative in both environments.

The optative is assumed to be the realization of a subjunctive operator *Subj* scoping over the clause at LF. Bary and Maier illustrate their analysis with the following example:

(207) Mary was complaining about the meeting.

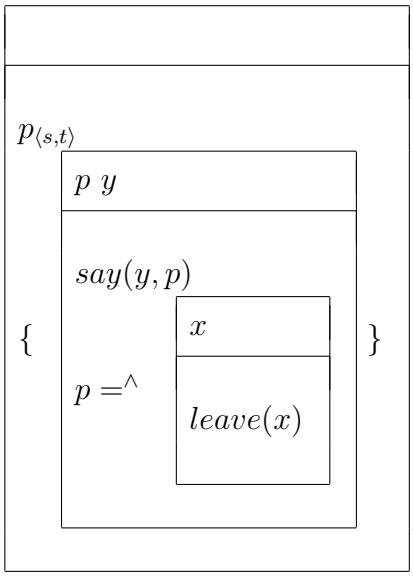
a. She said that [*Subj* [somebody left]].

b. *Subj* [Somebody left]. (Bary and Maier, 2014, from ex. (14))

The context sentence in (207) can be continued with an optative complement report following an explicit speech predicate, as in (207a), or it can be followed by an optative main clause, as in (207b).

Subj [somebody left] gets the DRS representation in (208):

(208)

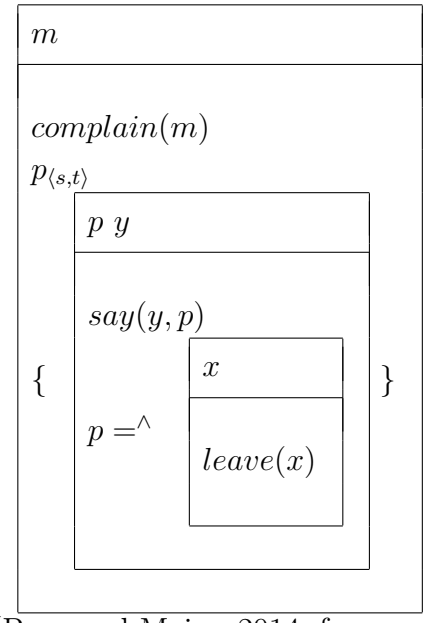


The sentence is associated with a complex presupposition: p is a discourse referent for a proposition, namely that somebody left. p is presupposed to be uttered by some individual y. Both p and y need to be resolved.

The DRS also has non-presuppositional content, which is simply the proposition p. This is needed to provide a uniform analysis of syntactically embedded indirect discourse and UID. In cases where (208) serves as the complement of a speech verb, it needs to contribute a proposition. As we will see, the asserted condition p causes some difficulties in the unembedded cases, however: p is a possible worlds proposition, as indicated by the subscript on p in the DRS. Bary and Maier's analysis assumes an intensional modal DRT semantics, where conditions denote truth values, not propositions. Therefore, p does not have the correct type.

Let us first look at the UID continuation of the context sentence in (207), namely (207b). Sequencing the context DRS and (208) would result in the following DRS:

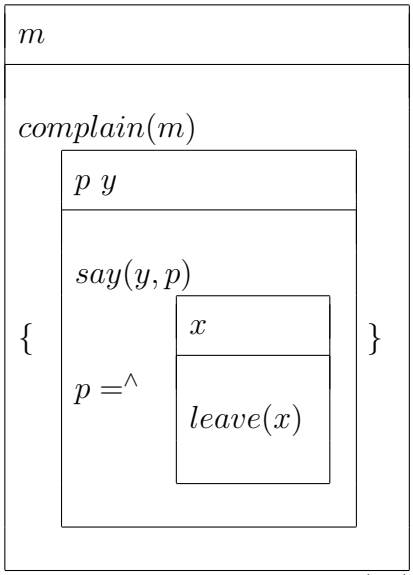
(209)



(Bary and Maier, 2014, from ex. (17))

This DRS is not well-formed: the condition $p_{\langle s,t\rangle}$ doesn't have the correct type for conditions, which should be of type t, not $\langle s,t\rangle$, as explained above. Following Fabricius-Hansen and Sæbø (2004), Bary and Maier stipulate that conditions of type $\langle s,t\rangle$ are deleted under sequencing. The result is therefore as follows, before anaphoric resolution:

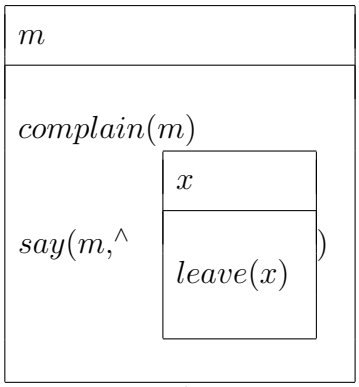
(210)



(Bary and Maier, 2014, ex. (18))

We now need to resolve the reportive presupposition. y can be resolved to m. Furthermore, p and the condition $say(m,p)$ need to be accommodated. Bary and Maier (2014, p. 88) argue that the accommodation of p comes for free: every proposition exists *a priori*, so nothing is added to the common ground. The final DRS after presupposition resolution and subsequent reductions looks as follows:

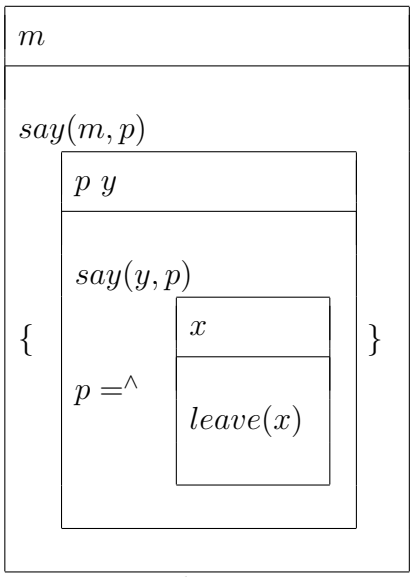
(211)



(from Bary and Maier, 2014, p. 88)

A reported optative clause can also serve as argument to an overt speech predicate, as in (207a). The propositional variable in the assertion part of (208) serves as an argument to the speech predicates, yielding (212). In this case, p does not cause any type difficulties, as the complement to a speech verb should be of type $\langle s, t \rangle$.

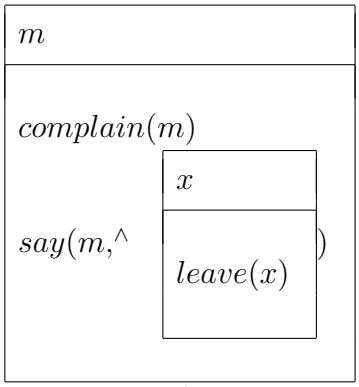
(212)



(from Bary and Maier, 2014, p. 89)

The accommodation of p comes for free as before. y can be bound to m, as the assertive DRS already contains the condition $say(m, p)$. After presupposition resolution, reductions and merger with the context, we get (213):

(213)



(from Bary and Maier, 2014, p. 89)

Bary and Maier (2014, p. 90-91) argue that Ancient Greek AcIs, when used in UID, also have a *Subj* operator, but that this operator is not morphologically realized: infinitives simply do not have an optative form. They remain agnostic to whether complement AcIs also have this operator.

6.3.2 Reportive presupposition as event anaphora

In my view, anaphora seems to be a fruitful way to account for UID. As we have seen, the clauses which constitute a stretch of UID are truly main clauses. However, their interpretation depends on material in the previous textual context, and anaphora may be a suitable device for accounting for this cross-sentential effect. But what kind of anaphoric discourse referents should be used? In Fabricius-Hansen and Sæbø's and Bary and Maier's approaches, there are two anaphoric discourse referents, an individual and a propositional discourse referent, which are in a specific relation to each other. As Bary and Maier point out, it is in some sense true that all propositions exist, which, they argue, makes it easy to accommodate discourse referents of this type. The only part of the complex anaphoric structure which can be resolved to an actual antecedent is the individual who serves as AH for the indirect discourse. The proposition will have to be accommodated every time. I find it slightly counterintuitive to rely on anaphora for an element which never has an antecedent in the context, and which exists in the real world only in a very abstract sense.

UID mostly occurs where there is an explicit speech verb in the context, or where a speech situation is easily inferred from the context. Since the propositional anaphor is accommodated, this connection must be a result of the binding of the individual anaphor in Bary and Maier's approach. According to them, the antecedent must be a suitable agent of communication, which restricts the possible antecedents for the individual anaphor in contexts where a speaker is mentioned or inferred.[84] This contextual dependence can be modelled more directly if UID clauses are taken to be event anaphors which need to be resolved to an attitudinal event.

In this section, I propose a theory of UID which in several respects draws on the insights from Fabricius-Hansen and Sæbø (2004) and Bary and Maier (2014), but which models reportive presupposition in event anaphoric terms instead of using individual and propositional anaphors. To present the technical issues as clearly as possible, I will in this section use simple constructed examples and disregard perspective shift and LDRs. In the next section, the analysis is extended and modified to capture the Latin facts. We will see that the anaphoric machinery used in previous chapters is not quite powerful enough to properly account for the resolution of the reportive presupposition. I will therefore augment the anaphora resolution mechanism with so-called *bridging relations*.

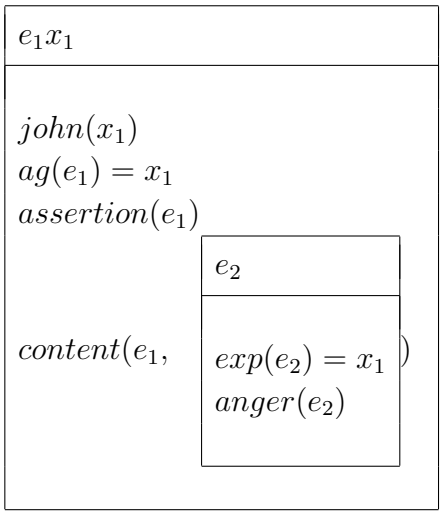
An issue which I am postponing is the connection between reportive presuppositions and reportive morphology. For now, I assume that there is an operator OP_{rep} exclusively occurring in UID main clauses which contributes this presupposition. Consider the following example:

[84] In Ancient Greek, it is apparently also possible to switch from indicative to AcIs/optative clauses without mention of a speech situation, to indicate generic reporting or hearsay. Bary and Maier (2014, sect. 3.4) analyze this as UID where also the AH is accommodated. I omit discussion of this phenomenon, since to my knowledge it is not possible in Latin.

(214) John said that he was angry. OP_{rep} Someone had misbehaved.

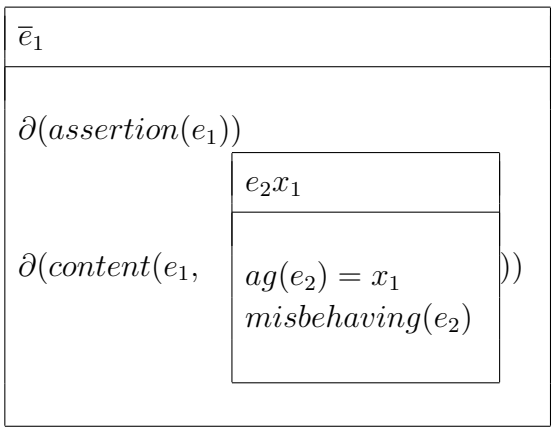
According to the semantics laid out in the previous chapter, the context sentence can be represented as follows:[85]

(215)



The UID sentence contains the operator OP_{rep}. This operator adds an event anaphor with a couple of presuppositional conditions:

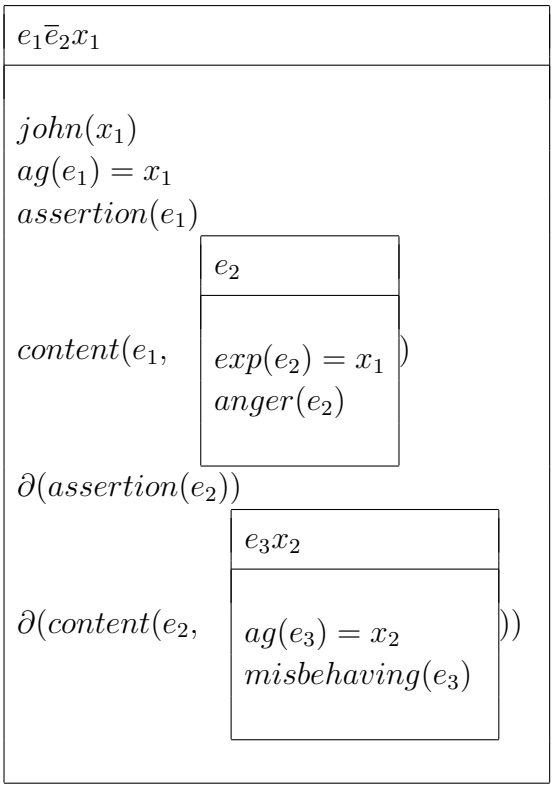
(216)



The anaphoric event contains a presuppositional condition stating that it is an assertion event. Furthermore, it is presupposed that there is a content relation between the event anaphor and the proposition expressed by the sentence.

When we sequence the two DRSs and try to resolve the event anaphor, we run into difficulties:

[85] I leave out the anaphoricity of *he*, as it is not relevant here.

(217) (215);(216)= 

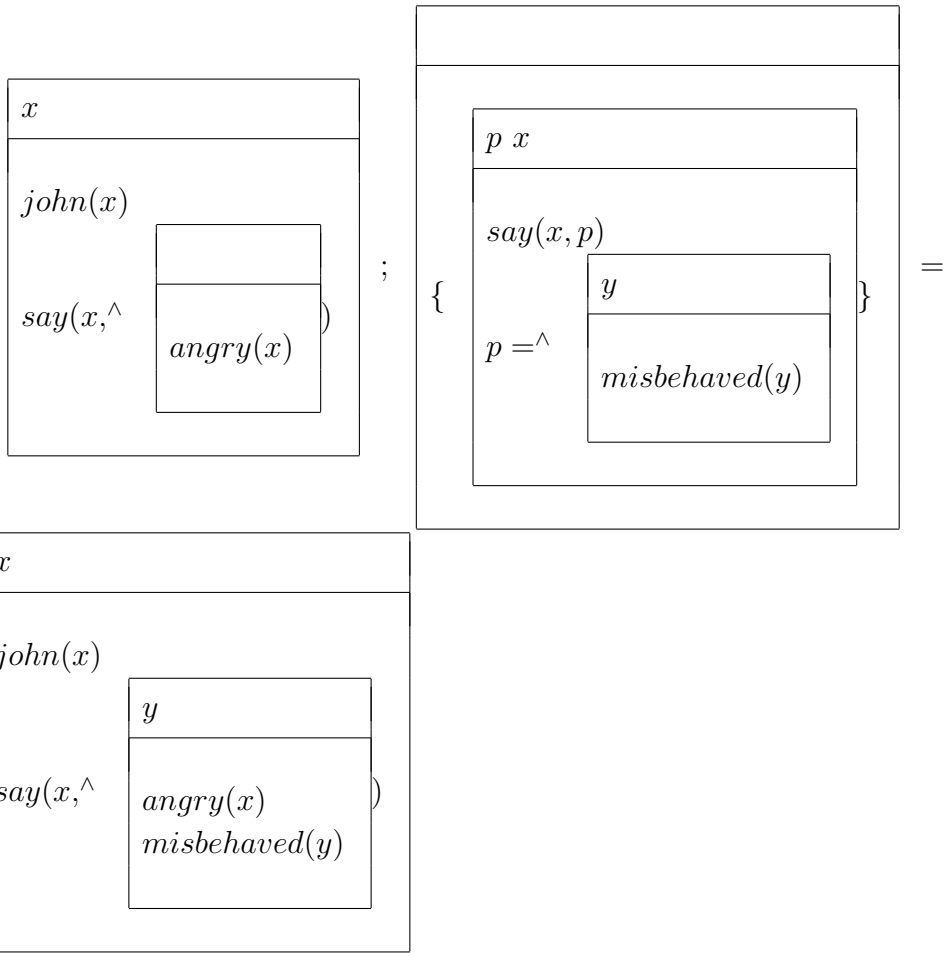
, $\mathcal{A} = \{\langle e_2, e_1 \rangle\}$?

There are two distinct but related difficulties in (217): first, the anaphoric e_2 in the matrix DRS should be resolved to e_1, but it is not certain that e_1 conforms to the presuppositional restrictions of e_2. Second, assuming that such a resolution is possible, we need the contents of e_1 and e_2 to be part of the same DRS, to account for discourse relations within the indirect discourse such as anaphora and relations induced by discourse particles like *enim*, discussed in section 6.2. However, if we merge the contents of the two events, the anaphora resolution must in some way be able to alter the semantic representation. But the anaphoric resolution of e_2 to e_1 takes place outside of the semantics proper according to PCDRT assumptions, so it should in principle not affect the semantic representation in such a way. I propose a solution to the former difficulty first, which, as it turns out, will also solve the latter with a small modification of the assumptions.

One reason why it might be problematic to resolve e_2 to e_1, is the presuppositional condition associated with e_2 which states that the DRS of the UID sentence, *Someone had misbehaved*, is relativized to e_2. For e_2 to be resolved to e_1, the content of e_2 must be compatible with e_1. But this is arguably not the case. As we saw in subsection 5.2.2, the *content* relation abbreviates a quantification over possible worlds compatible with the content of the verbal event, following Hacquard (2006, 2010). Hacquard (2006, p. 141) argues that the worlds compatible with the content of the event of the verb *say* are simply the worlds compatible with the proposition of the complement clause. Since e_1 and e_2 embed different DRSs, the modal bases will be different if we follow Hacquard on this point. If this is the case, the content presupposition of e_2 is not compatible with a resolution to e_1. Before I present my solution, let us briefly look at a previous solution to this problem, namely that of Fabricius-Hansen and Sæbø (2004, sect. 3.5.2). As previously mentioned, the assumptions of Bary and Maier (2014) are mostly similar to those of Fabricius-Hansen and Sæbø (2004): reportive presuppositions are construed

as a relation between an anaphoric individual and an anaphoric proposition. In cases like the present one, where a sentence of UID follows a sentence with a speech verb and a complement, Fabricius-Hansen and Sæbø argue for a special accommodation mechanism where the proposition of the UID sentence is sequenced with the complement of the context sentence:

(218)



The first sentence contains a speech verb and a complement representing what John said. It is reasonable to see the UID sentence as a continuation of John's discourse. Given that the UID sentence continues the discourse of the initial speech complement, it is relatively costless to accommodate the proposition of the UID sentence in the content of John's saying, as is done in the last DRS in (218). Subsequent UID sentences can incrementally update the content in the same manner.

Fabricius-Hansen and Sæbø's solution cannot be adopted as-is, of course, as they do not use event semantics. However, I think their analysis accurately points out what is going on in such constructions: UID sentences following a commenced instance of indirect discourse are interpreted as a continuation of that discourse.

My suggestion is that the anaphoric event in cases like this is interpreted as a continuation of the antecedent event. On the basis of the theory of anaphora presented in subsection 4.4.4, it is impossible to make sense of this intuition. An anaphoric event cannot be interpreted as a continuation of the antecedent, only as equal to the antecedent. However, Haug (2014b) proposes a modification of the PCDRT anaphoric machinery

to handle more indirect anaphor-antecedent relations, *bridging relations* (see also Haug, 2014a).

Bridging relations are relations between two objects or events in a text, which are needed for the textual coherence, but which are not explicitly stated and must be inferred (Clark, 1977; Asher and Lascarides, 1998). (219) lists two typical examples:

(219)

a. John walked into the room. The window looked out on the bay.

b. Peter went shopping yesterday. The walk did him good. (Adapted from Clark, 1977, ex.s (16) and (17))

In (219a), the window will be interpreted as being in the room mentioned in the previous sentence. This relation between the window and the room is necessary for the discourse to make sense, although it is only inferred. (219b) exemplifies the same phenomenon, but with events rather than objects: There is a bridging relation between the walking event in the second sentence and shopping event in the first.

In van der Sandt's account of presuppositions as anaphora, the definite description *the window* in (219a) would be accommodated and not bound. The mention of a room in the previous sentence is certainly among the conditions which makes this accommodation admissible, but there is no anaphoric link between the room and the window.

In PCDRT, it is not possible to implement an accommodation mechanism of the kind found in van der Sandt (1992). There are at least two reasons for this. The first is that the mechanism is not compositional as it alters the input context. The second reason is more technical: the complex anaphoric function $\mathcal{A}$ does not pick antecedent discourse referents directly in the DRS structure, as I explained in subsection 4.4.4, but depends on a mapping from the word introducing the anaphor to the word introducing the antecedent (the formal implementation is found in appendix B). If some accommodation mechanism were introduced to add a discourse referent at an appropriate position in the context, this discourse referent would be inaccessible to anaphoric binding, since it would not be linked to a word.

The alternative proposed by Haug (2013) is to implement bridging relations in the anaphoric machinery. According to the interpretation of the anaphoric condition (cf. sections 4.4.4 and 4.6), there is a relation of equality between the individual or event assigned to the anaphoric discourse referent, and that assigned to the antecedent:

(220) For all register subtypes α, $\forall x_{\pi_\alpha}.\forall s.ant(s)(x) \rightarrow \partial(v_\alpha(s)(x) = v_\alpha(s)(\mathcal{A}(s)(x)) \wedge \mathcal{A}(s)(x) < x)$ (=(100))

In the anaphora account with bridging, the interpretation rule does not make reference to any specific relation between an antecedent and an anaphor. Instead, it is underspecified. The relation is provided by a function $\mathcal{B}$ in the pragmatically informed full interpretation, in a parallel fashion to how $\mathcal{A}$ picks antecedents for anaphors (cf. subsection 4.4.4). $\mathcal{B}$ maps from anaphoric registers (of events or individuals) to binary relations between individuals or events. It defaults to equality, but provides other relations

too, given sufficient contextual support. In appendix B.2, I have proposed a formal implementation of $\mathcal{B}$ as well as some minor changes to the anaphoric system to accommodate it, following in part Haug (2014b).

The interpretation of the anaphoric condition (100) can be reformulated as in (221), where $\mathcal{B}$-rel abbreviates the relation denoted by $\mathcal{B}(s)(x)$ (using infix notation for the sake of readability):

(221) For all register subtypes α, $\forall x_{\pi_\alpha}.\forall s.ant(s)(x) \rightarrow \partial(v_\alpha(s)(x)\ \mathcal{B}\text{-}rel\ v_\alpha(s)(\mathcal{A}(s)(x)) \wedge \mathcal{A}(s)(x) < x)$ (cf. Haug, 2014b, ex. (61))

The inhabitant in a state s of an anaphoric register x is in the relation to its antecedent, $\mathcal{A}(s)(x)$, specified by $\mathcal{B}(s)(x)$.

(219a) can now be represented as follows:

(222)

$x_1 x_2 \overline{x}_3$
$john(x_1)$ $room(x_2)$ $walk\_into(x_1, x_2)$ $window(x_3)$ $seaview(x_3)$

$\mathcal{A} = \{\langle x_3, x_2 \rangle\}$
$\mathcal{B} = \{\langle x_3, \lambda x.\lambda y.in(x, y) \rangle\}$

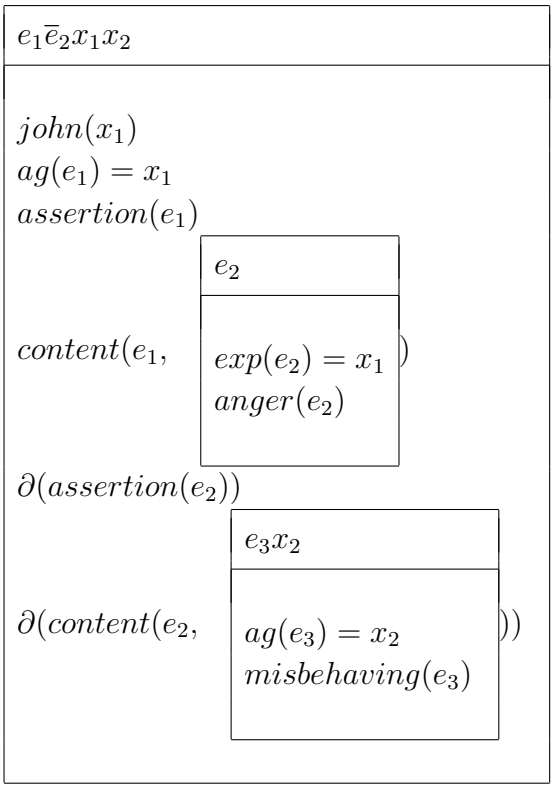
$\mathcal{A}$ picks out x_2, *the room*, as the antecedent for x_3, *the window*, in the usual fashion. $\mathcal{B}$ gives the relation between the anaphor and the antecedent: the window is inferred to be in the room.

A good amount of contextual support is needed to infer a bridging relation other than the default equality relation. It is presumably relatively easy to infer a bridging relation for complex presuppositional expressions such as, e.g., definite descriptions, because they have rich descriptive content. For a pronoun, there is very little or no descriptive content. In such cases $\mathcal{B}$ should default to equality.[86] [87]

We now have a mechanism for modelling indirect anaphor-antecedent relationships, which we can use in the event-semantic account of reportive presuppositions. We established above that the UID sentence of (214) should be interpreted as a continuation of the indirect discourse in the context sentence. This can be formalized as a bridging relation between the event anaphor of the UID sentence and the event of the attitude verb of the first sentence:

[86] But there are cases where bridging seems to possible with pronouns, too; cf. Nouwen (2003, sect. 3.3.7.2) and Haug (2014a). I will argue for a case of pronominal bridging in subsection 7.2.2.

[87] Note that van der Sandt-style accommodation is more powerful than bridging. Bridging requires an accessible antecedent, while accommodation does not rely directly on material in the accessibility path. Many cases of accommodation can be reinterpreted as bridging, but there are presumably cases where a more powerful mechanism is called for, because no textual antecedent is present.

(223) (215);(216)= 

,

$\mathcal{A} = \{\langle e_2, e_1\rangle\}$
$\mathcal{B} = \{\langle e_2, \lambda x.\lambda y.continuation(x, y)\rangle\}$

The anaphoric event e_2 can now be interpreted as a continuation of e_1. However, as I argued above, part of the attractiveness of the account of Fabricius-Hansen and Sæbø (2004) was that the contents of the context clause and the UID clause end up in the same box. It is not yet possible to do that in the current framework. A modification of the DRS representation based on the anaphoric resolution is controversial in a compositional theory like PCDRT, as it does not follow from the meaning of the lexical items involved that such a merge should take place. Instead, it must somehow be the result of pragmatic inferences about the relation between events involved in the discourse.

On the other hand, the semantic difference between (223) and a DRS where the contents of both events are in the same box is quite small: if the anaphoric event e_2 is the continuation of e_1, both events together form, in some sense, a larger utterance event. Subsequent continuation bridges should result in an even larger event in a similar way. When presenting a plural semantics for LDRs in subsection 5.4.3, I introduced the sum operator $\oplus$, which constructs plural individuals out of atomic individuals. The same operator can be used to construct a plural assertion event $e_1 \oplus e_2$ out of the individual events e_1 and e_2 (cf. Eckardt, 2002, for a formal treatment). I suggest that whenever contentful events $e_\alpha, ..., e_n$ are in continuation relations with each other, the contents of the individual events should be sequenced in the content of the sum of $e_\alpha, ..., e_n$. To capture this, I propose the following rule:

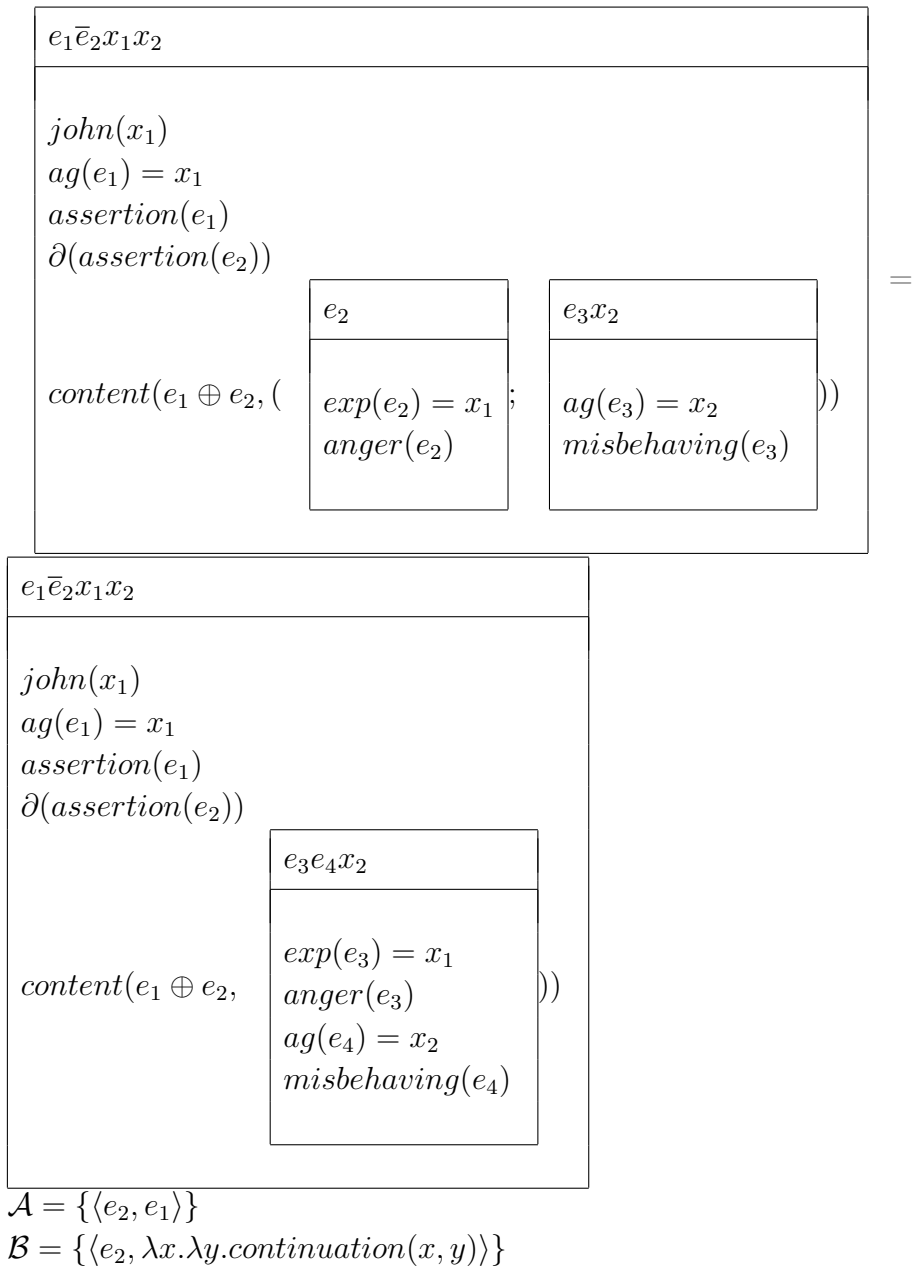
(224) **Sequencing rule for continued indirect discourse:**
Suppose we have the contentful events $e_\alpha, ..., e_n$ which are anaphorically linked to each other with the bridging relation *continuation*. In this case, $[e_\alpha, ..., e_n|$

$content(e_\alpha, K), ..., content(e_n, L)]$ should be replaced by $[e_\alpha, ..., e_n |$ $content(e_\alpha \oplus, ..., \oplus e_n, (K; ...; L))]$

This operation is a violation of compositionality: a pragmatic process, the anaphoric resolution, leads to an alternation of the semantic structure. It comes, however, at a low cost, as it does not affect the truth conditions, only the accessibility within the stretch of UID.

Given this rule, we can rewrite (223) as follows:

(225)



$\mathcal{A} = \{\langle e_2, e_1 \rangle\}$
$\mathcal{B} = \{\langle e_2, \lambda x.\lambda y.continuation(x, y) \rangle\}$

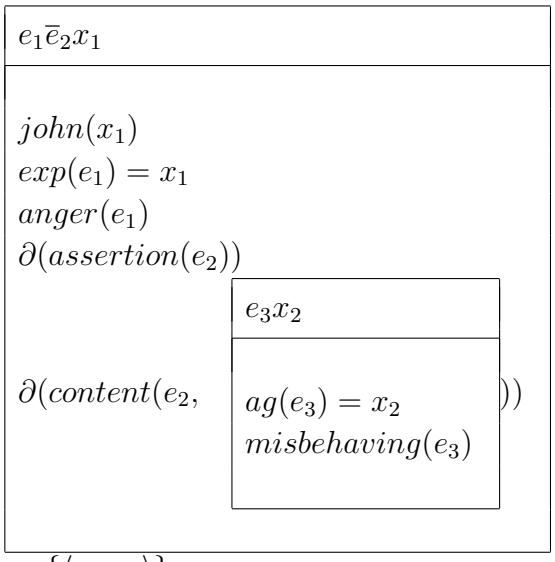
The contents of e_1 and e_2 are sequences in the content of $e_1 \oplus e_2$, according to the rule in (224), yielding a content box containing the entire UID. The content of subsequent UID sentences can be added in the same way, provided that a continuation bridge can be inferred.

Bridging can also be used in cases where the UID isn't introduced by an explicit report verb. As we have seen above, there is usually a mention of a situation which makes an utterance salient in the context, as in (226):

(226) John was angry. OP_{rep} Someone had misbehaved.

For Bary and Maier (2014), the reportive presupposition can be accommodated in examples like this, because there is mention of an individual which is a salient source of a report, cf. subsection 6.3.1. According to Fabricius-Hansen and Sæbø (2004, p. 247), accommodation of an utterance is possible in examples such as (226) because there is a discourse relation of elaboration between the two sentences. In the current framework, this discourse relation can be modelled as bridging:

(227)



$\mathcal{A} = \{\langle e_2, e_1\rangle\}$
$\mathcal{B} = \{\langle e_2, \lambda x.\lambda y.elaboration(x, y)\rangle\}$

The utterance event of the anaphoric e_2 is interpreted as an elaboration on John's angry state e_1. In examples like (227), it is clear that the agent of the anaphoric utterance event is equal to the experiencer of the antecedent event. We will see below that it is not always the case that the agent/experiencer of the anaphoric event also is an agent/experiencer of the antecedent event in Latin. But presumably, the identity of the agent/experiencer of the anaphoric event has to be easy to infer for the bridging to be licit.

Further UID sentences can subsequently be added to an instance of UID by means of continuation bridging relations:

(228) a. John was angry. OP_{rep} Someone had misbehaved. OP_{rep} He had cursed at everyone.

b.

$e_1 \overline{e}_2 \overline{e}_3 x_1$
$john(x_1)$ $exp(e_1) = x_1$ $anger(e_1)$ $\partial(assertion(e_2))$ $\partial(assertion(e_3))$ $content(e_2 \oplus e_3,$

$e_4 e_5 x_2 \overline{x}_3$
$ag(e_4) = x_2$ $misbehaving(e_4)$ $ag(e_5) = x_3$ $cursing(e_5)$

$))$

$\mathcal{A} = \{\langle e_2, e_1\rangle, \langle e_3, e_2\rangle, \langle x_3, x_2\rangle\}$
$\mathcal{B} = \{\langle e_2, \lambda x.\lambda y.elaboration(x, y)\rangle, \langle e_3, \lambda x.\lambda y.continuation(x, y)\rangle,$
$\langle x_3, \lambda x.\lambda y.x = y\rangle\}$

Note that e_3 is resolved to an antecedent which is itself an anaphor. Long stretches of UID will in other words contain chains of anaphors with bridging relations to each other. Since the entire UID is in the same box, the individual anaphor x_3 can pick an antecedent within the UID, x_2. This would not be possible if the contents were in separate boxes.

In (228), I have stated the bridging relation as pertaining to the event anaphors and the individual anaphor, although the latter defaults to equality. From now on, I will only indicate the anaphoric relation when it does not default to equality.

6.3.3 Where is the reportive presupposition represented?

Where does the OP_{rep} operator come from? As we have seen, Fabricius-Hansen and Sæbø (2004) and Bary and Maier (2014) associate their reportive presuppositions with report morphology, and propose a unified account of complement clauses and main clauses with reportive verb forms. Given the assumptions of the previous chapter, it is not immediately obvious how such a connection to morphology should be formalized in my PCDRT account: the relative interpretation of attitudinal complements comes from the attitudinal complementizer, not the attitude verb, as explained in subsection 5.3.2, and the semantic representation of an attitudinal complement does not have the same type as a root clause (cf. the denotation of the attitudinal complementizer in (136a)). It is therefore not obvious how to make a uniform semantic representation of clauses with report morphology that fits both the embedded and unembedded cases.

Instead, I propose that attitudinal complements and UID clauses have one thing in common, namely an event-relative interpretation of the clause's proposition. They differ

in that the event to which the proposition is relativized is bound by a lambda abstractor in the former case, and by an event anaphor in the latter.

There is in fact some evidence from Latin that attitudinal complements and UID clauses are structurally different. In attitudinal complements, indirect questions are realized as subjunctive clauses, as seen in (229a) (=(9c)). In UID, questions are often realized as subjunctives too. However, a rhetorical question will be an AcI rather than a subjunctive, as in (229b). In attitudinal complements, however, questions cannot be AcIs, even when they should be interpreted as rhetorical questions, as in (229c) (Haug et al., 2017, p. 10-12). In other words, UID clauses seem to allow for structural differences which are unavailable in attitudinal complements.

(229)

a. *Rogant me serui [quo eam].*
ask.IND me.ACC servants.NOM where go.SBJV.1SG

'The servants ask me where I am going.' (Pl. Cur. 362; Jøhndal 2012, p. 88)

b. *... [copias etiam Germanorum sustineri posse*
troops.ACC furthermore Germans.GEN hold.back.PASS.INF can.INF
munitis hibernis] docebant: ...
strengthen.PTCP.PRF.ABL winter.camps.ABL point.out.PST.IND
quid esse levius aut turpius, quam auctore hoste
what.ACC be.INF lighter or nastier than originator.ABL enemy.ABL
de summis rebus capere consilium?
about highest matters take.INF advice.ACC

'They pointed out that the troops of the Germans could be sustained by strengthening the winter camps: ... what is more stupid and disgraceful [they asked] than taking advice from the enemy in important matters?' (Caes. Gal. 5.28.3; Menge, 2000, p. 657)

c. (Sophocles' sons try to get control of his property on the ground of imbecility. In court, he points to his latest work, Oedipus at Colonus.)
Tum senex dicitur ... recitasse iudicibus
then old.man.NOM say.PASS.IND recite.PRF.INF judges.DAT
quaesisse=que [num illud carmen desipientis videretur ...]
ask.PRF.INF=and whether that poem.NOM imbecile.GEN seems.SBJV

'Then the old man is said to have read [his poem] to the judges and to have asked whether that poem seemed like the work of an imbecile.' (Cic. Sen. 22; explanation of context, example and translation according to Haug et al., 2017, ex. (16))

However, cross-linguistic facts might suggest that the reportive presupposition isn't related to morphological form at all. LDRs and logophors are reported to occur in multi-sentence indirect discourse in Ewe and Tamil, languages which do not have dedicated report morphology (Clements, 1975; Sundaresan, 2012). The reported examples have

at least superficial similarities with UID, although detailed empirical studies are needed in order to establish whether they are in fact the same phenomenon. I will return to cross-linguistic data in section 6.6.

Moreover, an interpretation similar to UID seems to be possible in English too, as in the examples used in the previous section:

(230) John said that he was angry. Someone had misbehaved.

Given the indirect discourse in the first sentence, it is possible to interpret the second sentence as being part of John's utterance rather than being a claim about a fact of the world. Since there is no over morphology in which marks the second sentence as reported, it might be argued that the reportive presupposition is not structurally represented, but is in some way accommodated or inferred in order to establish an appropriate discourse relation between the two sentences.[88] This might be an interesting approach, at least for the languages without dedicated report morphology, but possibly also for UID in general. For the purpose of this dissertation, however, I assume that the report presupposition is structurally represented in the left periphery of UID sentences. More concretely, I assume that the such sentences are associated with a dedicated matrix C head, C_{uid}.

Based on the formalizations in subsection 6.3.2, C_{uid} for AcIs should have a denotation like in (231) (omitting perspective shift for the moment):

(231) **Denotation of C_{uid}, first version:**

$$[[C_{uid}]]^{M,a} = \lambda K. \begin{array}{|l|}\hline \overline{e}_1 \\ \hline \partial(assertion(e_1)) \\ \partial(content(e_1, K)) \\ \\ \hline \end{array}$$

The operator takes the proposition of the UID sentence, and relativizes it to an anaphoric event $\overline{e}_1$.[89] The operator also associates a presuppositional event description with the anaphoric event. Since the anaphor always is in a bridging relation with its antecedent, the event description of the anaphoric event and the antecedent event may be different. In cases such as (197), the anaphoric event is not the same kind as the introductory attitudinal event, and when there is no attitudinal event in the context, the anaphoric event will always have a different event description from its antecedent.

The use of an event description such as $\partial(assertion(e_1))$ suggests that AcI UID is limited to speech reports. I have tried to look for examples of UID in mental state

[88] This is based on a suggestion from Bart Geurts (p.c.).

[89] Bary and Maier (2014, p. 86) criticize Fabricius-Hansen and Sæbø (2004) for abstracting over the DRS of the UID sentence. In their framework, this abstraction crosses an intensional operator, which is not licit, since the truth value assigned to the DRS may vary from world to world (Gamut, 1991b, p. 131-132). Note that the present framework is not affected by that critique, since I use an extensional modal framework. P in (231) is not of type t, but is (the PCDRT equivalent of) a possible worlds proposition. $content(e_1, P)$ is not an intensional operator, but abbreviates a quantifier over possible worlds in the full PCDRT notation, see subsection 5.3.2.

contexts, and found two potential examples, given in (232).[90]

(232)

a. *ipse somniavit [... gemmato curru ... ad caelum esse*
PROX.NOM dreamt.IND jeweled chariot.ABL to heaven be.INF
raptum]; *cum=que raperetur,* *octoginta et*
drag.off.PTCP.PRF.ACC when=and drag.off.PST.PASS.SBJV 80 and
novem numeros explicuisse ... cum=que positus
9 numbers.ACC explain.PRF.INF when=and place.PTCP.PRF.NOM
esset in circulo ingenti aereo, diu solus et destitutus
was.SBJV in circle huge aerial long.time alone.NOM and destitute.NOM
stetit ....
stood.IND

'He himself dreamt that he was dragged off to heaven in a jewelled chariot. And when he was dragged off, he counted the numbers 80 and 9 ... And then he was placed in a huge circle in the air, where he stood for a long time, alone and destitute.' (Historia Augusta 10.12.1-2)

b. *cuius rei putat iste [rationem reddi*
which thing.GEN think.IND PROX.NOM account.ACC return.PASS.INF
non posse, quod ipse tabulas averterit];
not can.INF because PROX.NOM records.ACC misappropriate.PRF.SBJV
se autem habere argentarii tabulas, in quibus sibi
REFL.ACC but have.INF banker.GEN records.ACC in which REFL.DAT
expensa pecunia lata sit accepta=que
paid.out money.NOM produced.NOM is.SBJV credited.NOM=and
relata.
reproduced.NOM

'[Aebutius] thinks that no account of this transaction can be found, because he himself has stolen the records, while he has in his possession banker's records, in which the money is recorded both in his expenses and credits.' (Cic. Caec. 6)

It is not entirely clear that (232a) is an instance of UID. It might be argued that the second sentence in this example is in fact coordinated with the first. The clitic conjunction *que* can either be interpreted as a proper conjunction or a discourse particle. Also, interestingly, the account of the dream switches to indicative in the last sentence, which might indicate that UID is a bit odd in this environment. (232b) is less problematic: it is clearly UID, as the second sentence contains *autem*, a discourse particle only occurring in

[90]This phenomenon might be more frequent than the scarcity of the retrieved examples suggests. It is difficult to find relevant examples in unannotated corpora, as there are few textual cues which can be used to query for the construction. Note that (232a), is from late antiquity, unlike the other Latin examples in this dissertation (see sect. 1.2). *Historia Augusta* was written in the third and fourth century AD.

main clauses. It could be taken as an implicit utterance report, i.e., of Aebutius reporting on his own thoughts. But from the textual context, this interpretation seems unlikely. It therefore seems that UID is possible for thought reports, at least to some extent.

The AcIs in UID reporting should have a different event description from the standard utterance cases. It is possibly even necessary to have a separate event description in dream reports like (232a), to the extent that UID is possible in dream reports. Instead of having a lexically specified event description for each different environment, it might be that the event type is, at least to some extent, contextually determined. Since I will only deal with UID in utterance reports in the following, I will leave this issue open, and assume that AcI UID clauses have the event description $\partial(assertion(e_1))$.

As mentioned in section 6.2, subjunctive clauses with *ut/ne* can be used in UID, to signal an order or a wish, as in (233) (= (201)):

(233) *... Ariovistus$_i$ ad Caesarem legatos mittit: Velle se$_i$*
Ariovistus.NOM to Caesar messengers.ACC sends.IND want.INF REFL.ACC
de his rebus ... agere cum eo: uti ... iterum colloquio
about these things talk.INF with him that again meeting.DAT
diem constitueret ...
day.ACC decide.SBJV

'Ariovistus$_i$ sends messengers to Caesar: he$_i$ wanted to talk about these things with him. Caesar should again find a date for a meeting.' (Caes. Gal. 1.47.1; Menge, 2000, p. 565)

UID subjunctive clauses must obviously have an event description different from AcIs, to account for their manipulative and desiderative semantics.[91] This, however, creates difficulties for the semantics of instances of UID where AcIs and subjunctive clauses are mixed. Because of discourse relations within the UID, the contents of both the AcI clauses and subjunctive clauses should be in the same box. However, it is not obvious how UID clauses with different modalities can be mixed in that way. Let us say we have two contentful events, e' and e''. e' is a declarative utterance and e'' is a manipulative utterance. e' will quantify over worlds compatible with the agent's assertion, while e'' will quantify over worlds compatible with what the agent requires the addressee to do. In other words, the modal base is different in the two cases. The anaphoric event of the subjunctive clause in (233), when resolved to the event anaphor of the preceding UID clause, should somehow embed the contents of both clauses. This cannot simply be done by merging the contents, since the modal bases are different. Note that this problem is independent of the specific event-based attitudinal semantics applied here. The problem would also arise with a more standard Hintikkan semantics. Similar problems arise when the UID is interpreted as a continuation of an attitudinal complement with a different modality from the UID clause. Questions used in UID also raise problems of a similar nature. These problems are beyond the scope of this dissertation, and I will leave it to future research to resolve them. In what follows, I will simply assume that some solution

[91] They are also possibly associated with an ordering source (cf. Heim, 1992; von Fintel, 1999).

exists.[92]

6.4 LDRs and perspective shift in UID

It is time to implement perspective shift and long-distance binding in UID. It was noted in the previous section that attitudinal complements and UID sentences are very similar: in both cases, the the indirect discourse is relativized to an event variable by means of the *content* relation. They differ in that the event variable is bound by a lambda operator in the case of attitudinal complements and by an anaphoric event discourse referent in the case of UID. This difference should not hinder us from implementing the approach to perspective shift from chapter 5 for UID. To quickly recapitulate, the complementizer of an attitudinal complement was argued to have the denotation in (235) (=(136)):

(235) $[[C_{p-shift}]]^{M,a} = \lambda K.\lambda V.\lambda e.$ $\boxed{\begin{array}{l} \\ \hline content(e, (\boxed{\begin{array}{l} x_1 \\ \hline PHolder_{reg}(x_1) \\ \partial(x_1 = \iota x.cp(e) = x) \end{array}}; K)) \end{array}}$ $; V(e)$

A discourse referent x_1 is added within the scope of *content*. The perspective is shifted to this discourse referent, and its inhabitant is presupposed to be the *cp*, i.e., the agent/experiencer, of the attitudinal event.

In (236) I have added the perspective-shifting machinery to the denotation of C_{uid} from (231):

[92]Note, however, that there are similarities between the problem of multiple modalities in UID and a more well-known problem in the semantic literature, namely the behavior of presuppositions in sequences of attitude reports (cf., e.g., Karttunen, 1973; Heim, 1992; Maier, 2015). A belief report can cancel the presuppositions of a following desiderative report. (234a) is an example:

(234)

a. John believes that Mary will come. He hopes that Sue will come too.

b. *John hopes that Mary will come. He believes that Sue will come too. (Maier, 2015, ex. (7))

The hope report in (234a) contains the presupposition trigger *too*. Presuppositions generally escape attitude complements. However, in this case, the presupposition appears to be bound by the belief complement in the previous sentence. If the attitude predicates come in the reverse order, as in (234b), it becomes hard to interpret *too* at all. Like in UID, there seems to some kind of accessibility between attitudes of different modalities. Maier (2015) argues that desiderative attitudes are parasitic on doxastic attitudes: A desiderative attitude will always be embedded within a doxastic attitude. It might be possible to argue, in the case of UID, that desiderative and manipulative attitudes are embedded under assertive attitudes.

(236) **Denotation of C_{uid}, final version:**

$$[[C_{uid}]]^{M,a} = \lambda K.$$

$\overline{e}_1$
$\partial(assertion(e_1))$
$\partial(content(e_1, ($ **[** x_1 | $PHolder_{reg}(x_1)$, $\partial(x_1 = \imath x.cp(e_1) = x)$ **]** $; K)))$

The denotation of C_{uid} in (236) is different from the complementizer of attitudinal complements in (235) in three respects: first, and most importantly, the proposition of the sentence is relativized to an event anaphor e_1, and the *content* relation is part of the presuppositional conditions associated with that anaphor, while the attitudinal event is abstracted over in (235); second, there is no abstraction over verbal predicates in (236), unlike in (235), since an UID sentence is a root clause and does not combine compositionally with a verb; third, there is an event description in the UID clause, cf. the discussion in subsection 6.3.3 above. For embedded indirect discourse, the event description comes from the attitudinal predicate.

Now that we have a semantics for perspective shift in UID, we can account for LDRs in this environment. Let us work through a few examples of typical cases. The first is UID which is not introduced by an explicit attitude predicate. I will use constructed examples here for clarity.

(237) John$_i$ was angry. C_{uid} Someone had kicked SE$_i$.

The DRS of the UID sentence is as follows:

(238)

$\overline{e}_1$
$\partial(assertion(e_1))$
$\partial(content(e_1,$ **[** $e_2 x_1 x_2 \overline{x}_3$ | $PHolder_{reg}(x_1)$, $\partial(x_1 = \imath x.cp(e_1) = x)$, $\partial(PHolder_{reg}(\mathcal{A}(x_3)))$, $ag(e_2) = x_2$, $th(e_2) = x_3$, $kicking(e_2)$ **]** $))$

(238) is sequenced with the context, which gives the following result:

(239)

$e_1 \overline{e}_2 x_1$

$john(x_1)$
$exp(e_1) = x_1$
$anger(e_1)$
$\partial(assertion(e_2))$
$\partial(content(e_2,$ $e_3 x_2 x_3 \overline{x}_4$ $PHolder_{reg}(x_2)$ $\partial(x_2 = \imath x.cp(e_2) = x)$ $\partial(PHolder_{reg}(\mathcal{A}(x_4)))$ $ag(e_3) = x_3$ $th(e_3) = x_4$ $kicking(e_3)$ $))$

$\mathcal{A} = \{\langle x_4, x_2\rangle, \langle e_2, e_1\rangle\}$
$\mathcal{B} = \{\langle e_2, \lambda x.\lambda y.elaboration(x, y)\rangle\}$

The anaphoric event e_2 takes e_1 as an antecedent with an elaboration bridging relation between the two, as explained above. The LDR x_4 is resolved to the shifted $PHolder$, x_2. x_2 is equal to the agent/experiencer of the anaphoric event. We know this to be John. This, however, is a pragmatic inference based on the resolution of e_2 to e_1, and does not follow from the semantic structure itself. Therefore, I have not replaced the iota expression with x_1.

In cases like this, the actual antecedent of the LDR is determined by the particular bridging relation established between the anaphoric utterance event and the antecedent event. This predicts more variation than in attitudinal complements with respect to what kind of antecedents LDRs can take, as the antecedent relation depends on a pragmatically determined relationship between events. In subsection 7.2.3 I will explore a case where this prediction is borne out.

Next, let us go trough a constructed example where UID follows an attitude predicate and a complement.

(240) John$_i$ says that SE$_i$ is angry. C_{uid} Someone kicked SE$_i$.

Both the context sentence and the UID sentence have an LDR. (241) is the DRS for the context. The DRS for the second sentence is the same as in (238):

(241)

$e_1 x_1$

$john(x_1)$
$ag(e_1) = x_1$
$assertion(e_1)$
$content(e_1,$

$e_2 x_2 \overline{x}_3$

$PHolder_{reg}(x_2)$
$\partial(x_2 = \imath x.cp(e_1) = x)$
$\partial(PHolder_{reg}(\mathcal{A}(x_3)))$
$exp(e_2) = x_3$
$anger(e_2)$

$)$

$\mathcal{A} = \{\langle x_3, x_2 \rangle\}$

Sequencing the two DRSs has the following result:

(242)

$e_1 \overline{e}_2 x_1$

$john(x_1)$
$ag(e_1) = x_1$
$assertion(e_1)$
$content(e_1,$

$e_2 x_2 \overline{x}_3$

$PHolder_{reg}(x_2)$
$\partial(x_2 = \imath x.cp(e_1) = x)$
$\partial(PHolder_{reg}(\mathcal{A}(x_3)))$
$exp(e_2) = x_3$
$anger(e_2)$

$)$

$\partial(assertion(e_2))$
$\partial(content(e_2,$

$e_3 x_2 x_3 \overline{x}_4$

$PHolder_{reg}(x_2)$
$\partial(x_2 = \imath x.cp(e_2) = x)$
$\partial(PHolder_{reg}(\mathcal{A}(x_4)))$
$ag(e_3) = x_3$
$th(e_3) = x_4$
$kicking(e_3)$

$))$

$\mathcal{A} = \{\langle x_3, x_2 \rangle \langle e_2, e_1 \rangle\}$

$$\mathcal{B} = \{\langle e_2, \lambda x.\lambda y.continuation(x, y)\rangle\}$$

I have not provided an antecedent yet for x_4, the LDR of the UID sentence, as the choice of antecedent depends on the sequencing of the contents.

Since there is a continuation bridging relation between e_2 and e_1, we must sequence the contents in accordance with the rule in (224):

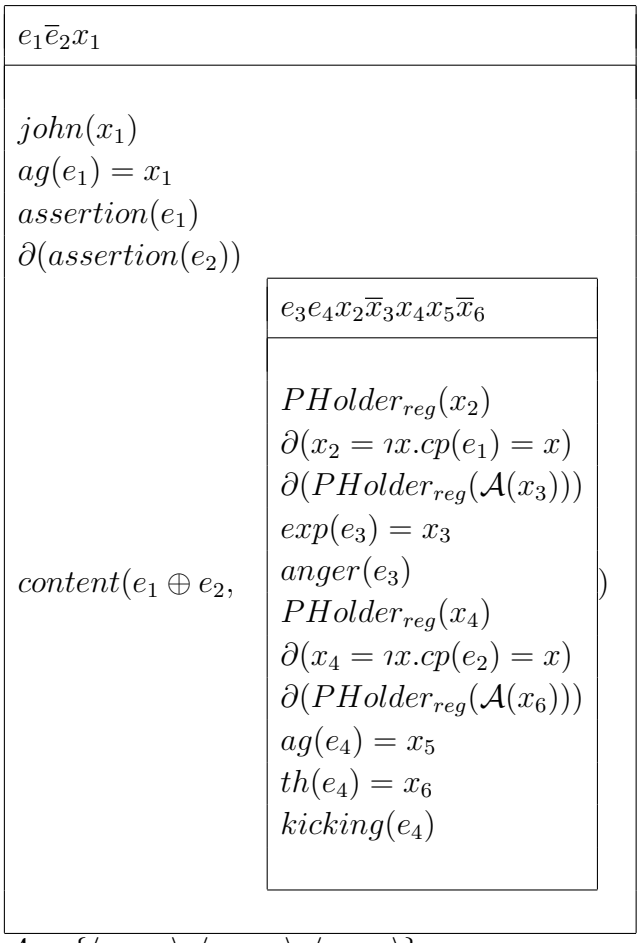
(243)

$e_1 \overline{e}_2 x_1$	
$john(x_1)$ $ag(e_1) = x_1$ $assertion(e_1)$ $\partial(assertion(e_2))$ $content(e_1 \oplus e_2, ($	$;$

$e_2 x_2 \overline{x}_3$
$PHolder_{reg}(x_2)$ $\partial(x_2 = \imath x.cp(e_1) = x)$ $\partial(PHolder_{reg}(\mathcal{A}(x_3)))$ $exp(e_2) = x_3$ $anger(e_2)$

$e_3 x_2 x_3 \overline{x}_4$
$PHolder_{reg}(x_2)$ $\partial(x_2 = \imath x.cp(e_2) = x)$ $\partial(PHolder_{reg}(\mathcal{A}(x_4)))$ $ag(e_3) = x_3$ $th(e_3) = x_4$ $kicking(e_3)$

$))$ $=$



$\mathcal{A} = \{\langle x_6, ...\rangle, \langle x_3, x_2\rangle, \langle e_2, e_1\rangle\}$
$\mathcal{B} = \{\langle e_2, \lambda x.\lambda y.continuation(x, y)\rangle\}$

Sequencing the two contents results in two $PHolder$ registers, x_2 and x_4, with the accompanying conditions, and both are technically speaking accessible to the second LDR, x_6. However, the approach does not lead to antecedence ambiguity. Given plausible constraints on the *continuation* bridging relation, the $PHolder$ registers will always be inhabited by the same individual, so it does not matter if the LDR is resolved to one or the other register. I therefore suggest that the representations are simplified by keeping only the first $PHolder$ register. In other words, (243) can be reduced to (244):

(244)

$e_1 \overline{e}_2 x_1$

$john(x_1)$
$ag(e_1) = x_1$
$assertion(e_1)$
$\partial(assertion(e_2))$

$content(e_1 \oplus e_2,$

$e_3 e_4 x_2 \overline{x}_3 x_4 \overline{x}_5$

$PHolder_{reg}(x_2)$
$\partial(x_2 = x_1)$
$\partial(PHolder_{reg}(\mathcal{A}(x_3)))$
$exp(e_3) = x_3$
$anger(e_3)$
$\partial(PHolder_{reg}(\mathcal{A}(x_5)))$
$ag(e_4) = x_4$
$th(e_4) = x_5$
$kicking(e_4)$

$)$

$\mathcal{A} = \{\langle x_5, x_2\rangle, \langle x_3, x_2\rangle, \langle e_2, e_1\rangle\}$
$\mathcal{B} = \{\langle e_2, \lambda x.\lambda y.continuation(x, y)\rangle\}$

In (244), the LDR of the UID sentence, x_5, is resolved to the only accessible antecedent which matches the $PHolder$ presupposition, x_2. x_2 is inhabited by the agent of e_1, that is, x_1, John.

The result of sequencing of the contents in UID is a representation which is very similar to that of an attitudinal complement. We can therefore apply the machinery developed for long-distance binding in attitudinal complements to cases of UID as well.[93] [94]

[93]It would be interesting to know if it is possible to embed an instance of UID under another. I know of only one potential example. Riemann (1884, p. 40) argues that there is an example in Livius (Liv. 22.37.2-9) of an entire multi-sentence discourse which is itself contained within UID. The argument is based on the reference of one LDR, which seems to pick up a different individual from other LDRs in the same passage. Unfortunately, however, the passage containing the relevant LDR exists in multiple versions across manuscripts. The reading chosen by Riemann does not occur in any manuscript, but is based on a philological conjecture (cf. Walters and Conway, 1967). Due to the philological uncertainty, it is difficult to use the example to make a grammatical argument. (Thanks to Vibeke Roggen (p.c.) for pointing out the philological issues with that passage.)

[94]My analyses of UID and cross-sentential reflexive binding make crucial use of bridging relations between events. In light of this, it is interesting to note that McCready (2007) draws on of rhetorical relations such as *explanation* and *narration* (Asher and Lascarides, 2003) to explain certain cross-sentential, albeit non-attitudinal, cases of long-distance reflexive binding in Japanese.

6.5 An additional challenge: UID and deeply embedded attitudinal complements

Before concluding the analysis of LDRs in UID in Latin, I wish to point out an issue mentioned by Marius Jøhndal (2012, sect. 4.4.5). I became aware of the significance of this issue very close to the submission deadline of this dissertation, and I have not had time to integrate it properly in my analyses. Here I will explain the issue and why it is not trivial to account for, and briefly suggest some possible ways of capturing it.

In both examples in (245), a stretch of UID follows a sentence where an attitudinal complement is embedded within an another. The use of LDRs and other pronouns shows that the UID is a continuation of the higher attitudinal event in (245a) and the lower one in (245b):

(245)

a. pro$_i$ *ait* *[se$_i$* *nihil* *contra* *dicere,* *sed* *illos$_j$*
says.IND REFL.ACC nothing.ACC against say.INF but they.ACC
putare *[talenta* *CC* *se$_j$* *debere]].* *ea* *se$_i$*
think.INF talents.ACC 200 REFL.ACC owe.INF that.ACC REFL.ACC
velle *accipere.* *debere* *autem* *illos$_j$* *paulo* *minus.*
want.INF accept.INF owe.INF however they.ACC little less

'He$_i$ says that he$_i$ has no objections, but they$_j$ think they$_j$ owe 200 talents. He$_i$ will accept that, but they$_j$ do in fact owe him a bit less [he$_i$ says].' (Cic. Att. 5.21.12; Jøhndal, 2012, ex. (83), p. 135)

b. *atque* *[eum$_j$* *loqui,* *quidam* *αὐθεντικῶς$_i$* *narrabat,* *[Cn.*
and him.ACC talk.INF some.NOM firsthand.autority told.IND Gnaius
Carbonis, *M.* *Bruti* *se$_j$* *poenas* *persequi* *...]].*
Carbo.GEN Marcus Brutus.GEN REFL.ACC revenge.ACC seek.INF
nihil *Curionem* *se$_j$* *duce* *facere* *quod*
nothing.ACC Curio.ACC REFL.ABL commander.ABL do.INF which.ACC
non *hic* *Sulla* *duce* *fecisset.*
not he.NOM Sulla.ABL commander.ABL do.PST.PRF.SBJV

'And one firsthand authority$_i$ told that he$_j$ [= Caesar] said that he$_j$ was seeking revenge for Gnaius Carbo and Marcus Brutus ... Curio did nothing with him$_j$ as commander that he [= Pompey] had not done with Sulla as commander [Caesar reportedly said].' (Cic. Att. 9.14.2; Jøhndal, 2012, ex. (84), p. 135)

In the first sentence of (245a), *putare* 'think' and its complement clause are embedded within a complement to *ait* 'says'. The LDR within the complement refers back to the lower AH, the subject of the thought verb. Then follows a passage of UID in the form of two root AcIs. It is clear both from the meaning and from the use of pronouns that the UID is a continuation of the speech event: the subject of the speech verb is picked up by the LDR, and the subject of the thought verb is picked up by *illos* 'they'. (245b)

is a highly complex example. In this case, the UID is introduced by a sentence where the speech verb *loqui* 'talk' and its complement are embedded within the complement of the matrix verb *narrabat* 'told'. Note, however, that the first part of the complement of *narrabat* is dislocated to the left of the matrix subject, so that the embedded speech verb precedes the matrix speech verb in the linear order. The LDR in the deeply embedded speech complement refers to the subject of the lower speech verb, Caesar, and crucially, the LDR in the UID which follows also refers to Caesar. It is clear that the UID is a continuation of Caesar's reported utterance.

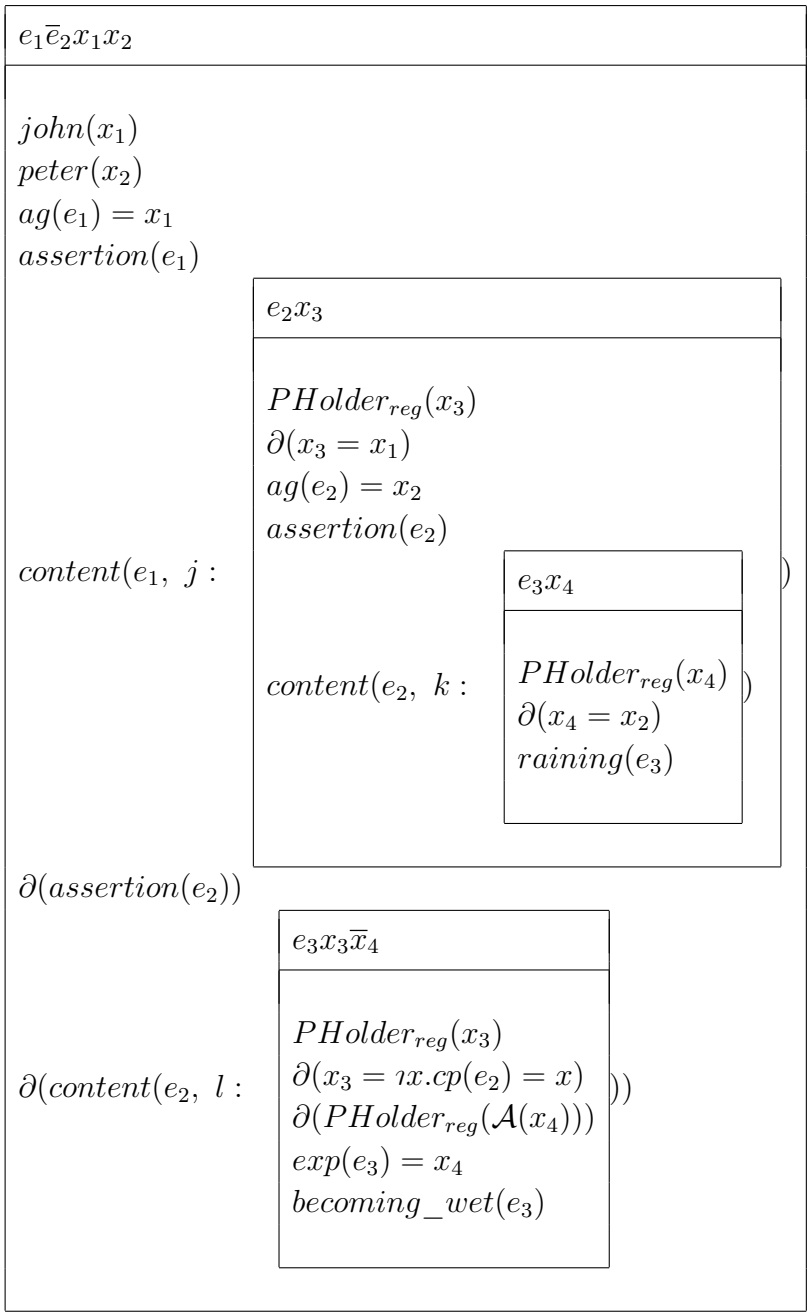
As it turns out, the theory of UID that I have presented above can only account for the reading in (245a), not the one in (245b). (245a) is not substantially different from examples discussed previously: the UID is interpreted as a continuation of an utterance event accessible in the global context, that of the matrix speech verb of the first sentence. The pattern in (245b), where the UID continues the most deeply embedded speech complement, is more surprising. Since this example is so complex, I will illustrate the issues it raises using a simpler fake English example:

(246) John$_i$ said [that Peter$_j$ said [that it was raining]]. SE$_j$ became wet.

The second sentence in (246) is a continuation of Peter's speech, and the LDR refers back to Peter.

If we sequence the two sentences in (246), we see that only John's saying event is accessible to the event anaphor of the UID sentence, not Peter's saying event. (247) shows the DRS of this example after the sentences are sequenced, but before the event anaphor is resolved to an antecedent. For clarity, I have added letters representing output states in front of each DRS:

(247) o:



The event anaphor e_2 in the matrix DRS o embeds the UID sentence. On the intended reading, this event is the continuation of Peter's speech event, e_2 in j. However, e_2 in j isn't accessible in the matrix DRS, and the event anaphor cannot be resolved to it. The only accessible antecedent is John's speech event, e_1. A resolution to that event would give the reading exemplified in (245a).

There are two quite similar solutions which easily come to mind. They are both unsatisfactory, but for an interesting reason. The first solution is that an accessible antecedent for the event anaphor is accommodated in the matrix context, given a version of DRT where accommodation is allowed; the second solution is that the accessibility constraints for the event anaphor are relaxed somewhat, so that it can be resolved to e_2 in j.

Both these solutions are problematic, because they involve lifting Peter's utterance

out of the modal context. In the first approach, a speech event with Peter as agent is accommodated in the matrix context, and in the second, the anaphoric event itself becomes a speech event of Peter's through a resolution to e_2 in j. However, the UID is likely a continuation of Peter's report within John's report. In a reasonable interpretation of (246), it continues John's report of Peters utterance, as the paraphrase in (248a) illustrates. There does not seem to be any independent reason for believing that Peter's utterance event is lifted out of the modal context and into the global context, the reading paraphrased in (248b). The source of Peter's utterance is presumably still John.[95]

(248)

a. John$_i$ said [that Peter$_j$ said [that it was raining]]. John furthermore said that Peter said that SE$_j$ became wet.

b. John$_i$ said [that Peter$_j$ said [that it was raining]]. Peter furthermore said that SE$_j$ became wet.

Cases of UID of this kind likely involve a continuation of both the superordinate and the embedded speech event, and a complete analysis of UID should account for the possibility of such a double continuation. This might be a promising finding given the analysis argued for in this chapter, as the UID clause is indeed a continuation of the accessible matrix utterance event. What we cannot account for formally is why it is also interpreted as a continuation of the embedded speech event. In subsection 6.3.3 and section 6.4, I suggested that the reportive presupposition is lexically specified on the matrix complementizer of UID sentences, as presented in the denotation of C_{uid} in (236). It is possible that this denotation could be refined somehow, in such a way that an UID clause could extend both the antecedent speech event and speech events embedded under it. It is far from clear to me at this stage what such a refinement would look like, if possible at all.

An alternative analysis could be that the double dependence does not arise directly from the semantics associated with report morphology, but is a consequence of an interpretational readjustment of some kind. Specifically, there might be an interesting parallel between the phenomenon under investigation and some of the examples of modal subordination reported by Roberts (1989), such as (249):

(249) If Edna forgets to fill the birdfeeder, she will feel very sad. The birds will get hungry. (Roberts, 1989, ex. (2))

In the salient interpretation of (249), the second sentence does not hold globally, but is somehow interpreted within the scope of the conditional antecedent in the previous sentence, *if Edna forgets to fill the birdfeeder*. However, this interpretation of the second sentence cannot be fully attributed to any lexical items it contains, but seems to be retrieved through an inference from the textual context. In Roberts' analyses, the

[95] I am indebted to Kjell Johan Sæbø (p.c.) for these observations as well as the suggested connection with modal subordination, mentioned below.

conditional antecedent is added to the second sentence through a kind of accommodation mechanism. In the same way that the first sentence of (249) makes a conditional antecedent salient, the first sentence of (246) makes a speech event embedded under a speech event contextually salient. It might be that the double dependence of examples like (246) is not fully derived from the semantics of the report morphology, but is accommodated, as it were, based on pragmatic inferences from the preceding sentence. I have no concrete proposals for an implementation, but it might be possible to combine the event-based approach to UID with an account of modal subordination (e.g., Roberts, 1989; Geurts, 1995; Frank and Kamp, 1997). Such an approach would most likely involve more radical departures from compositional semantics than those suggested elsewhere in this chapter.

While the analysis presented in previous sections is not quite powerful enough to handle the phenomenon discussed here, it is a useful approximation which can account successfully for a large portion of the data. I will therefore assume it in the remainder of thesis, and leave the issues discussed here for future research. Note, finally, that the same issues would arise in the non-event-based analyses of Fabricius-Hansen and Sæbø (2004) or Bary and Maier (2014), laid out in subsection 6.3.1. In those approaches, UID clauses presuppose an individual in a *say*-relation with a proposition. In cases like (246), that relation is as inaccessible from the matrix context, as the speech event is in my analysis.

6.6 Cross-linguistic data

Examples of LDRs in indirect discourse with cross-sentential antecedents are not specific to Latin. Similar examples have been reported to exist in several other languages (see, e.g., Sells, 1987; Sigurðsson, 1990; Oshima, 2007; Sundaresan, 2012). (250) is an Icelandic example:

(250) *Formaðurinn$_i$ varð óskaplega reiður. Tillagan væri svívirðileg og*
chairman.DEF became furiously angry proposal.DEF was.SBJV outrageous and
væri henni beint gegn sér$_i$ persónlega. Sér$_i$ væri sama...
was.SBJV it aimed against REFL personally REFL was.SBJV indifferent

'The chairman$_i$ became furiously angry. The proposal was outrageous, and it was aimed at him$_i$ personally. He$_i$ was indifferent...' (Icelandic; example, glosses and translation according to Sigurðsson, 1990, ex. (22))

In the first sentence, it is established that the chairman is angry. The subsequent sentences are marked as indirect discourse by subjunctive mood on the verbs, and LDRs refer back to the chairman.

Sundaresan (2012, sect. 3.1-3.2) reports on similar examples in Tamil. While a Tamil matrix clause cannot contain a long-distance bound reflexive in out-of-the-blue context, it can do so in clauses which elaborate on the words or state of mind of a discourse-internal protagonist (Sundaresan, 2012, p. 44-45), as in (251).

(251) *Raman-ŭkkŭ*$_i$ *oŋŋum-ee* *purija-læ.* *Taan*$_{i/*j}$ *maʈʈum* *een*
Raman-DAT nothing.ACC-EMPH understand-NEG REFL.NOM alone why
ippaɖi *ellaam* *kashʈappaɖa-ŋum?*
like.this all suffer-must

'Raman$_i$ didn't understand at all. Why should he$_{i/*j}$ alone suffer like this?' (Tamil; example, glosses and translation according to Sundaresan, 2012, ex. (28b))

The second sentence of (251) expands on Raman's confused state of mind. As indicated by the subscript index marker, the subject reflexive can only take Raman as its antecedent, not any other individual. As far as I understand, Tamil does not mark these clauses morphologically as indirect discourse, unlike Latin and Icelandic.

While these examples show interesting similarities with the Latin cases discussed here, it is difficult to establish without a more detailed study whether they should be analyzed as UID or, e.g., as free indirect discourse.

6.7 Concluding remarks

Following Fabricius-Hansen and Sæbø (2004) and Bary and Maier (2014), I have argued that the clauses constituting UID are associated with a reportive presupposition. I have formalized this reportive presupposition in terms of event-anaphora. A challenge with a compositional dynamic account like PCDRT is that presupposition accommodation is not possible, and accommodation has been appealed to quite extensively in the previous studies of UID. I have shown how bridging relations can replace a large part of the accommodation mechanism.

This discourse semantics of indirect discourse has been combined with the account of perspective shift from the previous chapter, so that perspective shift can extend over an entire stretch of UID. In that way, LDRs within UID have accessible antecedents which fulfil their perspectival presupposition. Therefore, by combining a discourse-semantic account of UID with the event-semantic approach to perspective shift, we can successfully capture the discourse binding of LDRs observed in Latin.

In addition to the integration of perspective and LDR binding, I believe the present approach improves on the previous analyses of UID in at least two ways. First, there are advantages to capturing the reportive presupposition as event anaphora over the complex presupposition used by Bary and Maier (2014) and Fabricius-Hansen and Sæbø (2004). The previous formulations of the reportive presupposition include an anaphoric proposition representing the reported content, which never has an antecedent in the discourse context. While this technically works in the version of DRT that they use, this seems somewhat unelegant and unintuitive. In the present, event-anaphoric approach, the event anaphor is required to find a textual antecedent in all cases.

Accommodation is also at issue in the second improvement of the present theory. Quite often, there is no explicit utterance in the textual context, but in such cases, an utterance event is usually easy to infer from other events in the textual context, at least in Latin: there may be a mention of someone sending messengers (as, e.g., in (201)), someone cry-

ing (as in (198)) etc. Previous approaches must rely heavily on accommodation in such cases, to accommodate both the reported proposition and the utterance relation between the speaker and the proposition. The approach argued for here does not need to remedy the context to capture these cases. Instead, the event anaphor is resolved to the event in the textual context which makes an utterance situation salient. To capture the indirect relationship between the anaphoric event and the antecedent event, a pragmatically inferred bridging relation is used. In that way, the account makes more direct use of the textual context in the analysis of such cases of UID. Bridging is also a much less powerful tool than van der Sandt-style presupposition accommodation, as it always requires an antecedent in the context.

Chapter 7

Messenger reports and residual issues

7.1 Introduction

The theory developed in previous chapters is able to account for the AH-reference of LDRs in indirect discourse, both attitudinal complements and UID. However, as we saw in subsection 2.4.2, there is a class of LDRs in indirect discourse in Latin which take somewhat unexpected antecedents, namely LDRs in indirect discourse conveyed by a messenger. These kinds of examples are, to my knowledge, not attested in other languages, and are therefore not discussed in the semantic literature on the phenomenon. My hope is that they will inform future discussions of LDRs, as they provide interesting insights into the referential possibilities of the pronoun in indirect discourse.

My data collection has shown that the phenomenon of messenger reports can be divided into three somewhat different subgroups, which I argue should be analyzed in distinct manners. In 7.2, I present the three types of messenger reports and my analysis of them.

In section 7.3, I leave the issue of messenger reports and turn to some residual data concerning Latin LDRs.

7.2 Messenger reports

7.2.1 The issue

It has been noted both in the grammatical literature and in linguistic work on LDRs in Latin that examples involving messengers lead to unexpected antecedence patterns (Menge, 2000, §85, 2a; Riemann, 1884, p. 139-140; Fruyt, 1987; Solberg, 2011; Jøhndal, 2012, sect. 4.4.4; Solberg, 2015). When messengers are sent to convey a message on behalf of a sender, LDRs often appear to refer to the sender, not the messenger. Examples are frequent in UID, but as we will see, there are also intra-sentential cases. I will draw on the machinery developed in previous sections of this chapter to account for both intra- and inter-sentential cases.

(252) gives some representative examples of messenger reports:

(252)

a. *Helvetii$_i$ ... legatos ad eum mittunt; cuius*
Helvetians.NOM messengers.ACC to he.ACC send.IND which.GEN
legationis Divico$_j$ princeps fuit ... Is$_j$ ita cum
embassy.GEN Divico.NOM leader.NOM was.IND he.NOM thus with
Caesare egit: ... se$_i$ ita a patribus maioribus=que
Caesar talked.IND REFL.ACC so from fathers elders=and
suis didicisse ut magis virtute contenderent quam
their learn.PRF.INF that more valour.ABL contend.PST.SBJV.3PL than
dolo aut insidiis niterentur.
trickery.ABL or plots.ABL rely.SBJV.SBJV.3PL

'The Helvetians$_i$ sends messengers to him. The leader of this embassy was Divico$_j$. He$_j$ talked with Caesar in these terms: ... They$_i$ had learned from their fathers and their elders that they should rather contend with valour than rely on trickery and plots.' (Caes. Gal. 1.13.2-4; Solberg, 2015, ex. (3a))

b. pro$_i$ *misit enim puerum$_j$: se$_i$ ad me venire ...*
sent.IND for boy.ACC REFL.ACC to me come.INF

'He$_i$ sends the boy$_j$ [to say that] he$_i$ will come to me.' (Cic. Att. 10.16.5; Jøhndal 2012, ex. (80a), p. 132)

c. *Ad quos cum Caesar$_i$ nuntios$_{(j)}$ misisset,*
to whom when Caesar.NOM messengers.ACC send.PRF.PST.SBJV
qui$_j$ postularent [eos [qui sibi$_i$ ... bellum
who ask.PST.SBJV them.ACC who.NOM REFL.DAT war.ACC
intulissent] sibi$_i$ dederent], responderunt:
inflict.PRF.PST.SBJV REFL.DAT surrender.PST.SBJV answered.IND

'When Caesar$_i$ sent messengers$_{(j)}$ to them, who$_j$ were to ask that they surrender to him$_i$ those who had attacked him$_i$, they answered:' (Caes. Gal. 4.16.3; Solberg, 2011, ex. (2.17a))

In (252a) (=(23)), a tribe, the Helvetii, sends messengers. Divico is the leader of the embassy and talks with Caesar. A stretch of UID follows *Id ita cum Caesare egit* 'He [Divico] talked with Caesar in these terms'. In the UID, LDRs refer to the sender of Divico, the Helvetii, not to Divico himself. (252b) is from one of Cicero's letters. The first sentence of the example asserts that an individual sends a boy. After this sentence comes an AcI, and the reader infers that it reports the message the boy transmitted to Cicero. However, LDRs refer to the sender of the boy, not the boy himself. (252c) is a relatively complex example. The clause *Caesar nuntios misisset* 'Caesar sent messengers' is followed by a subjunctive-marked intentional relative clause explaining Caesar's purpose for sending the messengers. The relative clause contains an utterance predicate *postularent* 'ask' with the messengers as subject. Nevertheless, the attitudinal complement following the utterance verb contains LDRs referring to Caesar, the sender of the messengers.

While the sender of a message is in some pretheoretic sense the author of the message, data like this is challenging for a formal account of LDR antecedents: in (252a) and (252c), the LDR takes an antecedent which is different from the the subject of the active attitude predicate. There is no overt predicate in (252b), but it would be quite easy to insert one with the messenger as the subject.

This phenomenon is briefly mentioned in certain grammars, e.g,. Menge (2000, §85). Riemann (1884, p. 39-40) proposes an explanation: in many cases (such as (252a) above), the messengers are themselves part of the group which sends them, and the LDRs refer to that group. In direct speech, the messengers would have used the first person plural, which, in Riemann's opinion, corresponds to an LDR in indirect discourse. When the sender is not a group, Riemann suggests that the messengers repeat verbatim the words of the sender, which contain first person pronouns.

To handle cases like this, Fruyt (1987) suggests that verbs meaning 'send' should be considered as a type of utterance predicate (Fruyt, 1987, p. 207). Jøhndal (2012, sect. 4.4.4) tries out and rejects a solution along the same lines, noting that verbs of sending are by no means obligatory in such cases, as (253) illustrates:

(253) *legati*$_i$ *ab iis*$_j$ *venerunt, quorum haec fuit oratio: ...*
messengers.NOM from them came.IND whose this.NOM was speech.NOM
vel sibi$_j$ *agros attribuant vel patiantur eos tenere*
either REFL.DAT fields.ACC assign.SBJV or allow.SBJV them.ACC keep.INF
quos armis possederint
which.ACC arms.ABL occupy.PRF.SBJV

'Messengers$_i$ came from them$_j$ [the Germans] who gave the following speech: ... either they [the Romans] should assign them$_j$ fields or permit them to keep those they had occupied with arms.' (Caes. Gal. 4.72-4; from Solberg, 2011, ex. (2.17c); translation according to Jøhndal, 2012, ex. (82b), p. 133)

Instead, Jøhndal suggests that the messenger is assigned syntactically as the antecedent, according to his theory of long-distance binding, cf. subsection 3.4.6. The actual sender reference is resolved pragmatically. This pragmatic readjustment is possible because the messenger acts as a representative for the sender.

I have discussed examples like this at some length in my previous work (Solberg, 2011), but did not manage to find a satisfactory solution. I remarked that the subjunctive of the report predicate in examples like (252c) indicated that the predicate itself was embedded in a relative clause with a modal semantics, expressing the intention of the sender. I immediately rejected the idea that the LDR could be assigned from the relative clause, however, as such an explanation couldn't be generalized to other examples (Solberg, 2011, p. 24-25). Instead I drew on Sells' discourse roles to explain the phenomenon: I suggested that the LDRs were oriented towards the Self, the individual whose mind the report represents, not the utterance agent, the Source. In messenger reports, I suggested that the two roles were assigned to different individuals: the Source to the messenger and the Self to the sender. LDRs, being Self-referring, would be able to bypass the messenger and pick up the sender (Solberg, 2011, p. 95-101). As Jøhndal (2012, p. 133-134) correctly

points out, this solution forces us to abandon the implicational hierarchy between the discourse roles that Sells argues for. Sells uses this hierarchy to make cross-linguistic predictions, and an important motivation for dividing perspective into three roles was precisely that predictive power.

Later (Solberg, 2015), I attempted to show that messenger reports should be divided into three types with slightly different properties, based on a new corpus study of the phenomenon. The examples in (252) illustrate the three types. In examples such as (252a), which we may call Type 1, the binding of the LDR is able to skip the subject of an indicative report predicate and pick up the sender. As it turns out, this is only attested when the messenger is himself part of the group that sends him. Such examples can be treated in the plural semantics, along the lines suggested by Riemann. The LDR picks up the group which the messengers belong to. Type 2 messenger reports, of which (252b) is an example, are not restricted to group senders. These examples involve UID introduced by a mention of the sending or coming of messengers, but no overt report predicate. I argue below that a bridging account along the lines laid out above can be used to explain such examples. Finally, Type 3 messenger reports, exemplified in (252c), involve report predicates embedded within attitudinal adjunct clauses which give the sender's intention for sending messengers. I claim that the attitudinal adjunct clause acts as a perspective shifter.

The data collection was in part based on my classification of antecedents to LDRs in the Caesar and Cicero subcorpora of the PROIEL corpus (Haug et al., 2009). In addition to that, I have run queries for sentences with relevant keywords in the PHI corpus, cf. section 1.2.[96] I found approximately 80 cases in total of messenger reports with sender-oriented LDRs. This is of course a low number, and I cannot rule out that more data would reveal a more complex pattern. I will therefore try to be explicit about what data would be needed to falsify my analyses.

7.2.2 Type 1: Speaking on behalf of the group

To recapitulate, Type 1 messenger reports, exemplified by (252a), involve indirect discourse introduced by overt attitude predicates. These predicates are not necessarily embedded in any kind of modal or attitudinal environment, in contrast to Type 3 messenger reports. LDRs refer to the sender, and crucially, the sender always appears to be a group of which the messenger or messengers are members. Type 1 messenger reports are found both in UID contexts, as in (252a), repeated in (254a), and attitudinal complements, as in (254b) (=(5a)):

[96] A central part of this data collection was a query for collocations of different forms of the verb *mitto* 'send' and reflexive pronouns. Since this collection returned a high number of matches, only some of which were relevant, I focused on some selected authors and texts: *Bellum Africanum*, *Bellum Alexandrinum*, *Bellum Hispaniense*, Caesar, Cicero, Nepos, Livy, Pliny the Elder, Quintilian, Seneca the Elder, Seneca the Younger and Tacitus.

(254)

a. *Helvetii$_i$ ... legatos ad eum mittunt; cuius*
Helvetians.NOM messengers.ACC to he.ACC send.IND which.GEN
legationis Divico$_j$ princeps fuit ... Is$_j$ ita cum
embassy.GEN Divico.NOM leader.NOM was.IND he.NOM thus with
Caesare egit: ... se$_i$ ita a patribus maioribus=que
Caesar talked.IND REFL.ACC so from fathers elders=and
suis didicisse ut magis virtute contenderent quam
their learn.PRF.INF that more valour.ABL contend.PST.SBJV.3PL than
dolo aut insidiis niterentur.
trickery.ABL or plots.ABL rely.SBJV.SBJV.3PL

'The Helvetians$_i$ sends messengers to him. The leader of this embassy was Divico$_j$. He$_j$ talked with Caesar in these terms: ... They$_i$ had learned from their fathers and their elders that they should rather contend with valour than rely on trickery and plots.' (Caes. Gal. 1.13.2-4;Solberg, 2015, ex. (3a))

b. *Ibi ei praesto fuere Atheniensium$_i$ legati$_j$*
there him.DAT ready were.IND Athenians.GEN messengers.NOM
orantes [ut se$_i$ obsidione eximeret].
pray.PTCP.PRS.NOM.PL that REFL.ACC siege.ABL free.SBJV

'There he met messengers$_j$ from the Athenians$_i$ who begged him to free them$_i$ from the siege.' (Liv. 31.14.3; Riemann 1884, p. 139)

The subject of the participial speech predicate *orantes* 'praying' in (254b) is the Athenian messengers. However, it is clear from the context that the LDR refers to the Athenians, not only the messengers.

Note that there is a difference between (254a) and (254b): in (254a), the messenger is an atomic individual, and the LDR refers to the group he represents. The messengers in (254b) are themselves plural, so the LDR refers to a plurality which is larger than the plural subject of the speech predicate.

When the LDR is completely coreferent with the antecedent, I argued in subsection 5.4.3 that no special mechanism for LDR binding is needed. There is no type difference between singular and plural individuals. The same LDR can therefore pick both singular and plural antecedents. The case at hand is a bit different, however. In Type 1 messenger reports, the antecedent, whether singular or plural, is a subpart of the plural individual of the LDR. To capture this, I will use a bridging relation between the LDR and the antecedent: Instead of the default relation of equality between the anaphor and the antecedent, the antecedent can be in a subpart relation to the anaphor when there is contextual support for such a relation.

This solution is inspired by the analysis of partial control of Haug (2014b). Partial control (Lawler, 1976; Landau, 2004; Pearson, 2015b) is a phenomenon with interesting similarities to Type 1 messenger reports. With certain control verbs, a singular matrix subject can be used, even though the predicate of the control complement is collective

and therefore needs a plural subject:

(255) The chair$_i$ preferred PRO_{i+} to gather at six. (Landau, 2004, ex. (24a))

The subject of *preferred* in (255) is a singular individual, the chair, but the subject of the collective predicate *gather* is a plurality including the chair, as indicated by the subscript $i+$, such as the committee chaired by the matrix subject.

Like LDRs, PRO is a pronominal element with very limited referential freedom: it is coreferent with the superordinate subject or object, depending on the superordinate predicate. However, in cases like (255), strict coreference is not necessary, so PRO can refer to a plurality of which the controller is a part, as in Type 1 messenger reports.

Haug (2014b) proposes an anaphoric PCDRT account for control where partial control is analyzed as pronominal bridging: PRO is an anaphor which in most cases is completely coreferent with its antecedent. This is not an option in cases like (255), because the infinitival verb is collective. Instead, a bridging relation is established between the anaphor and the antecedent: the anaphor is a plural individual of which the antecedent is a subpart.

As we saw in subsection 6.3.2 above, bridging relations need contextual support to be established. Therefore, bridging is favored with presuppositional expressions with rich semantic content such as definite expressions. However, bridging is also possible with pronouns in certain cases, such as (256):

(256) John kept on staring at the newly-wed couple. She resembled a childhood sweetheart of his. (Mauner, 1996, quoted in Nouwen, 2003, ex. (3.86))

The bridging possibilities are more constrained, however, for pronouns than for presuppositional expressions with a richer content (Nouwen, 2003, sect. 3.3.7.2). Specifically, it must be possible to infer a unique individual from the antecedent. This explains, according to Nouwen (2003, p. 75), why a definite description, but not a pronoun, is licit in (257):

(257) The race horse suffered a lot. During the race the jockey/#he whipped it constantly. (Nouwen, 2003, ex. (3.92))

From *the jockey*, it is easy to infer a unique individual. However, since the context allows for many horse whippers, the trainer, the owner, the veterinarian, etc., *he* cannot be used.

Also, pronominal bridging seems to require that the bridging inference is somehow semantically available (Nouwen, 2003, p. 74-75). *Them* cannot be used to refer to the wheels of the car in (258). The inference from the car to its wheels is presumably pragmatic rather than semantic:

(258) We cannot use John's car. #All four of them are flat. (Nouwen, 2003, ex. (31.81))

In (256), on the other hand, *the newly-wed couple* makes available semantically a plurality of a man and a woman. It is possible to, e.g., use plural pronouns to refer back to it.

In the case of partial control, a unique plural individual which includes the antecedent must be semantically available. In (255), *the chair* makes available such a plural individual, namely the committee of which the antecedent is the chair. Along the same lines,

this approach explains why "superset control", where *PRO* denotes a subpart of a plural controller, is not available (Haug, 2014b, p. 224):

(259) The$_i$ chair was glad the$_j$ committee had agreed to $PRO_{i \sqsubset j}$ wear a tie. (From Landau, 2000, p. 7; quoted in Haug, 2014b, ex. (39))

This example cannot have the reading where the committee agrees that the chair should wear a tie. On a bridging account of partial control, this receives a natural explanation, since the group noun *committee* does not make semantically available a unique individual to which *PRO* can refer. As we will see, a bridging account has similar advantages for LDRs in Type 1 messenger reports.

The account I want to propose is as follows: the anaphoric relation between the LDR and its antecedent does not always default to equality. In particular, when the semantic context makes available a plurality of which the perspective holder is a member, the anaphoric relation can be a part-of relation, as in the case of partial control. (260) is a simplified semantic representation of (254b):[97]

(260)

$e_1 x_1 x_2 x_3$	
$athenians^*(x_1)$	
$messengers\_of^*(x_2, x_1)$	
$sulpicius(x_3)$	
$ag(e_1) = x_2$	
$goal(e_1) = x_3$	
$praying(e_1)$	
$content(e_1,$	$e_2 x_4 \overline{x}_5$
	$PHolder_{reg}(x_4)$
	$\partial(x_4 = x_2)$
	$\partial(PHolder_{reg}(\mathcal{A}(x_5)))$)
	$ag(e_2) = x_3$
	$th(e_2) = x_5$
	$freeing\_from\_siege(e_2)$

$\mathcal{A} = \{\langle x_5, x_4 \rangle\}$
$\mathcal{B} = \{\langle x_5, \lambda x.\lambda y.y \sqsubset x \rangle\}$

The agent of the praying event e_1 is the messengers x_2 representing the plural individual x_1, the Athenians. In this case, both the messengers and the senders happen to be plural individuals, as indicated by the superscript stars in the conditions (cf. subsection 5.4.3). The *PHolder* of the attitudinal complement, x_4, is coreferent with the agent of the contentful event, the messengers x_2.

[97] For clarity, I have added the name of the addressee, Sulpicius, although it is not mentioned in the example itself.

The LDR x_5 has only one possible antecedent, the *PHolder* x_4. A default equality relation between the antecedent and the anaphor would lead to messenger-referring LDRs. In this case, however, a bridging relation is established between the anaphor and the antecedent: the inhabitant of x_5 is a plural individual of which the messengers, x_4, is a subpart. This bridging relation is possible because there is a salient plural individual in the context of which the messengers are members, namely the Athenians. UID cases such as (254a) can be treated in the exact same way.

The part-of relation is due to a pragmatically inferred bridging relation and is not hardcoded in the semantics. Why, then, does this phenomenon seem to be constrained to such part-whole cases? As we have seen, pronominal bridging appears to be a highly constrained phenomenon. The bridging possibilities of an LDR are therefore expected to be very limited. Partial control also involves a part-whole relationship, and many of the examples of pronominal bridging given by Nouwen (2003, sect. 3.3.7.2) involve some kind of part-whole bridging. As Haug (2014b, p. 230) points out, pronominal bridging is not a well-understood phenomenon, and it is not yet clear what predictions a bridging account of this sort makes. One constraint which might be particularly relevant to the part-whole cases is that of semantic availability. Plurality is semantically represented, and part-whole relations are therefore readily available. Awaiting a more complete understanding of pronominal bridging, I content myself with the empirical evidence that this kind of bridging is constrained, and assume that it is limited to part-of bridges and perhaps certain other similarly salient relations.

This approach predicts that we should not get the reverse part-of pattern, i.e., where the antecedent denotes a plurality and the LDR denotes a subpart of that plurality. The reasoning is the same as for superset control, exemplified in (259): from a plurality we cannot unambiguously infer a unique individual.

When the sender of the messenger is an individual and the messenger is the subject of the utterance predicate, I predict that LDRs should not be able to refer to the sender. Except for cases which can be analyzed as Type 3 messenger reports, this prediction is borne out in the data I have looked at. Instead, other individual-referring expressions are used to refer back to the sender:

(261)

a. *... legati$_i$ ab Eposognato$_j$ venerunt nuntiantes*
messengers.NOM from Eposognatus came.IND announce.PTCP.PRS.NOM.PL
[profectum eum$_j$ ad regulos Gallorum nihil
depart.PTCP.PRF.ACC.SG him.ACC to chiefs Gauls.GEN nothing.ACC
aequi impetrasse];
fair.GEN obtain.PRF.INF

'Messengers$_i$ came from Eposognatus$_j$ who announced that he$_j$ did not obtain anything useful from going to the chiefs of the Gauls.' (Liv. 38.18.15)

b. … *legati*$_i$ *occurrerunt* *nuntiantes*
messengers.NOM approached.IND announce.PTCP.PRS.NOM.PL
[paratum *esse* *tyrannum*$_{sender}$ *imperata*
prepare.PTCP.PRF.ACC.SG be.INF tyrant.ACC commands.ACC
facere]
do.INF

'Messengers$_i$ [from Moagetes$_j$] approached them, announcing that the tyrant$_j$ was prepared to do what they asked.' (Liv. 38.14.4)

In (261a), the individual sender is referred to using a regular third person pronoun, and a description is used in (261b), *tyrannum* 'the tyrant'.

The lack of attested cases in my data like (261), but with sender-referring LDRs, is not a proof that such a pattern is ungrammatical.[98] Examples of that kind would constitute counter-examples to the present account.[99]

7.2.3 Type 2: Recovering the speech event

We saw in the previous chapter that UID does not need to be introduced by an explicit attitudinal predicate, provided that an utterance situation is easily inferred from the context. Let us call this a non-explicit introduction. A particularly common non-explicit introduction of UID is the mention of the sending of messengers, as in (262a) (= (252b)) and (262b). LDRs can refer to the sender. These examples are not restricted to group senders, unlike the previous type:

(262)

a. pro$_i$ *misit* *enim* *puerum*$_j$*:* *se*$_i$ *ad me venire* …
sent.IND for boy.ACC REFL.ACC to me come.INF

'He$_i$ sends the boy$_j$ [to say that] he$_i$ will come to me.' (Cic. Att. 10.16.5; Jøhndal 2012, ex. (80a), p. 132)

b. … *Philocles*$_i$ *regius* *praefectus* *a* *Chalcide* *nuntios*$_j$
Philocles.NOM royal prefect.NOM from Chalcis messengers.ACC
mittebat: *se*$_i$ *in tempore* *adfuturum* …
sent.IND REFL.ACC in time be.present.PTCP.FUT.ACC

'Philocles$_i$, the royal prefect, sent messengers$_j$ from Chalcis: He$_i$ would be there in due time.' (Liv. 32.16.13)

Similar examples discuss the sending or arrival of letters, as in (263):

[98]Note with respect to (261a) that the personal pronoun *is* is not in complementary distribution with LDRs in Latin (Solberg, 2011, p. 42-45). See also subsection 2.4.3.

[99]Solberg (2015) sketched an analysis based on the account of first person plurals of Kratzer (2009). It turned out to be difficult to combine this account with the plural semantics in subsection 5.4.3, and I have therefore chosen a slightly different analysis here.

(263) *... Caesonius$_i$ ad me litteras misit: Postumiam Sulpici*
Caesonius.NOM to me letter.ACC sent.IND Postumia.ACC Sulpicius.GEN
domum ad se$_i$ venisse.
house.ACC to REFL.ACC come.PRF.INF

'Caesonius$_i$ sent a letter to me: Postumia, Sulpicius' wife, had come to him$_i$ at his home.' (Cic. Att. 12.11.1)

In the analysis I presented of UID in section 6.4, cases of UID with non-explicit introductions were treated in terms of bridging relations between events. In these cases, the UID clause is associated with an anaphoric attitudinal event. When there is no explicit mention of an attitudinal event in the context, a bridging relation can be established between another event in the context and the anaphoric attitudinal event, provided that there is sufficient contextual support. In Type 2 messenger reports, the UID is an elaboration on what was communicated through the messengers, so a bridge between the sending event and the anaphoric event is very salient.

The sender-reference of the LDRs is surprising: if someone conveys a message by means of a messenger, then it should be easy to infer an utterance event with the messenger as agent. However, that would predict perspective shift to the messenger, not the sender. The solution proposed in the previous section does not work here, since the sender may be an (atomic) individual, as in (262a) and (262b). The DRS representation of (262b) illustrates the problem:

(264)

$e_1 \overline{e}_2 x_1 x_2$
$Philocles(x_1)$
$messengers(x_2)$
$ag(e_1) = x_1$
$th(e_1) = x_2$
$sending(e_1)$
$\partial(assertion(e_2))$
$\partial(content(e_2,$ $\begin{array}{\|l\|}\hline e_3 x_3 \overline{x}_4 \\ \hline PHolder_{reg}(x_3) \\ \partial(x_3 = \imath x.cp(e_2) = x) \\ \partial(PHolder_{reg}(\mathcal{A}(x_4))) \\ ag(e_3) = x_4 \\ coming(e_3) \\ \hline \end{array}$ $))$

$\mathcal{A} = \{\langle e_2, e_1\rangle, \langle x_4, x_3\rangle\}$
$\mathcal{B} = \{\langle e_2, \lambda x.\lambda y.elaboration(x, y)\rangle\}$

The anaphoric assertion event e_2 is resolved to the sending event e_1 with the bridge *elaboration*. In the incorrect reading where the messenger is the perspective holder, $\imath x.cp(e_2) = x$, the agent of the anaphoric event, is understood as x_2.

The parallel between messenger reports of this kind and examples involving letters such as (263) suggests that a different inference is relevant here: when letters are sent, no utterance event can be inferred apart from the sender's utterance communicated by means of letters. The letter is merely a vehicle by means of which the sender's utterance is communicated over large distances. Perspective shift to the sender is therefore expected in that case. The fact that we get the same pattern in examples involving messengers suggests a similar inference in both cases. The inferred attitudinal event has the sender as agent, with the messenger simply being the means by which he communicates over large distances. In this interpretation, $\imath x.cp(e_2) = x$ in (264) resolves to x_1, the sender of the messengers. To the extent that the messengers have a thematic relationship with e_2 at all, they are merely instruments.

Note that in cases like this, the actual resolution of the iota formula $\imath x.cp(e_2) = x$ is pragmatic rather than strictly semantic. Since e_2 is an anaphoric event in an inferred relation to another event, its thematic structure is not deterministically established, but depends on the anaphoric resolutions. The perspective shift to the sender in cases such as (264) is in other words pragmatically inferred rather than part of semantics proper. The frequency of examples like this might suggest that this inference is in some sense conventionalized, however.

If this inference is readily available, we should expect that the sender of messengers could serve as subjects of explicit attitude predicates. I am aware of one example of that kind:

(265) ... pro$_i$ *legationem* *misit,* *[qua* *aecum* pro$_i$ *censebat*
embassy.ACC sent.IND which.ABL fair.ACC express.opinion.PST.IND
[Sicilia *sibi$_i$* *omni* *cedi]]* ...
Sicily.ABL REFL.DAT all.ABL yield.PASS.INF

'[Hieronymus$_i$] sent an embassy, by means of which he$_i$ expressed the opinion that it was fair that he$_i$ was given all of Sicily.' (Liv. 24.6.9)

The verb *censebat*, which here means something like 'express an opinion', occurs in a relative clause. The relative pronoun, *qua*, referring to the embassy, is put in the ablative, which has an instrumental use in Latin. The interpretation seems to be that Hieronymus expresses his opinion by means of the embassy. In other words, the interpretation which is merely implicit in the examples above is made explicit.

Both the Type 1 messenger reports explained in the previous section and the present case rely crucially on pragmatically inferred bridging relations. In Type 1 messenger reports, the bridging relation is in the resolution of the LDR itself. LDRs in Type 2 messenger reports are identical with their antecedent. In this case, it is instead the attitudinal event which is in an inferred relation with the antecedent event.

7.2.4 Type 3: The purpose for sending messengers

Above I conjectured that it is impossible for an LDR to take an individual sender across an explicit attitude predicate with the messengers as subjects. There is a systematic exception to this, however: when the attitudinal predicate is embedded within a clause explaining the sender's intention for sending messengers, LDRs can be sender-referring. The phenomenon does not seem to be restricted to one specific morpho-syntactic marking of intention, as the following two examples show.

In (266a) (=(252c)), the LDRs are in the complement of an attitude predicate within a subjunctive relative clause.[100] The subjunctive marks the clauses as expressing intention (i.e., the subjunctive is *oblique*, cf. subsection 2.3.2). In (266b), the speech predicate is a supine, a non-finite control construction which also marks intention. The controller is the messenger, Gnaius Pompeius, but the LDR in the complement to the speech verb refers to the sender, Quintus Titurius.

(266)

a. *Ad quos cum Caesar$_i$ nuntios$_{(j)}$ misisset,*
to whom when Caesar.NOM messengers.ACC send.PRF.PST.SBJV
qui$_j$ postularent [eos [qui sibi$_i$ … bellum
who ask.PST.SBJV them.ACC who.NOM REFL.DAT war.ACC
intulissent] sibi$_i$ dederent], responderunt:
inflict.PRF.PST.SBJV REFL.DAT surrender.PST.SBJV answered.IND

'When Caesar$_i$ sent messengers$_{(j)}$ to them, who$_j$ were to ask that they surrender to him$_i$ those who had attacked him$_i$, they answered:' (Caes. Gal. 4.16.3; Solberg, 2011, ex. (2.17a))

b. *… Q. Titurius$_i$ … interpretem suum Cn.*
Quintus Titurius.NOM interpreter.ACC POSS.REFL Gnaius
Pompeium$_j$ ad eum mittit PRO$_j$ *rogatum [ut sibi$_i$*
Pompeius.ACC to him sends.IND ask.SU that REFL.DAT
militibus=que parcat].
soldiers.DAT=and spare.SBJV

'Quintus Titurius$_i$ sends his interpreter Gnaius Pompeius$_j$ to him to ask that he spare him$_i$ and his soldiers.' (Caes. Gal. 5.36.1)

Sender-orienter LDRs are also found in UID following an intentional clause of this kind:

[100] The complementizer *ut* is left out in the subjunctive complement to the subjunctive attitudinal predicate. This is not uncommon in Latin.

(267) … *placuit* *ei*$_{(i)}$ *ut* pro$_i$ *ad* *Ariovistum* *legatos*$_j$
seem.good.PRF.IND him.DAT that to Ariovistus messengers.ACC
mitteret, *qui*$_j$ *ab* *eo* *postularent* *[uti* *aliquem* *locum*
send.PST.SBJV who.NOM from him ask.PST.SBJV.PL that some place.ACC
medium *utrisque* *conloquio* *deligeret]:* *velle*
middle.ACC each.of.the.two.DAT meeting.DAT choose.PST.SBJV want.INF
sese$_i$ *de* *re publica …* *cum* *eo* *agere.*
REFL.ACC about state with him speak.INF

'He$_i$ decided to send messengers$_j$ to Ariovistus who$_j$ were to ask that he choose a place for a meeting on the halfway between the two of them: He$_i$ wanted to speak about the state with him.' (Caes. Gal. 1.34.1)

There is independent evidence that the LDRs are assigned by the purpose clause, not by the utterance predicate. When the passage regards sending messengers or letters, it is not uncommon to find similar purpose clauses with LDRs, even when the purpose clauses do not contain speech verbs, as in (268). In (268a), a purpose adverbial clause with the complementizer *ut* explains the reason for sending messengers, and an LDR refers to the sender. The same is seen in (268b), but with a subjunctive relative clause. An *ut*-clause explains the reason for sending letters in (268c), with LDRs referring to the sender.

(268)

a. … pro$_i$ *ad* *Scipionem* *Pompeium=que* *nuntios* *mittit* *[ut*
to Scipio Pompeius=and messengers.ACC sends.IND COMP
sibi$_i$ *subsidio* *veniat].*
REFL.DAT help.DAT come.SBJV

'He$_i$ sends messengers to Scipio and Pompeius, so that they can come to his$_i$ aid.' (Caes. Civ. 3.80.3; Jøhndal 2012, ex. (80b), p.132)

b. … pro$_i$ *Nicaeam* *Ephesum=que* *mittebat* *[qui* *rumores* …
Nicaea.ACC Ephesus.ACC=and sent.IND who.NOM rumors.ACC
celeriter *ad* *se*$_i$ *referrent].*
quickly to REFL.ACC report.SBJV

'He$_i$ sent [spies] to Nicaea and Ephesus, who were to report rumors quickly back to him$_i$.' (Cic. Deiot. 9.25; Kühner and Stegman 1976/1997b, p. 607)

c. … *Pompeius*$_i$ *litteras* *fratri* *misit,* *[ut* *celeriter*
Pompeius.NOM letter.ACC brother.DAT sent.IND COMP quickly
sibi$_i$ *subsidio* *veniret]* …
REFL.DAT help.DAT come.SBJV

'He$_i$ sent a letter to his brother, so that he could come to his$_i$ aid.' (De Bell. Hisp. 4)

The question then is why purpose clauses can assign LDRs in messenger contexts. I previously suggested two potential solutions (Solberg, 2015). The first is that the purpose clauses can assign LDRs by virtue of their intentional semantics. The second is that there is some kind of implied utterance event in these examples, e.g., the sender's instructions to the messenger. This latter solution is along the lines of the account of Type 2 messenger reports explained in the previous section.

The second solution would be somewhat exceptional, since there does not seem to be anything beyond the LDRs which forces us to assume an implied utterance. The first solution is therefore preferable. However, it predicts that LDRs should be found in purpose adjunct clauses in the language in general. The exact semantics of purpose adjunct clauses is a complicated issue which goes beyond the scope of this dissertation. It should, however, involve some kind of desiderative semantics. Kjell Johan Sæbø argues that *q in order that p* has a logical structure similar to *q because the agent wants that p* (Sæbø, 1991, 2012). In other words, a desiderative attitude is involved, in which the AH is the agent of the matrix clause.[101] Given the attitudinal semantics, perspective shift and long-distance binding would not be unexpected.

There is an empirical issue with trying to find LDRs in purpose clauses in Latin, namely that there are few linguistic items which unambiguously identify purpose constructions. *Ut* has a very frequent use as a complementizer in attitudinal complement clauses, and is therefore not a suitable keyword for a corpus query. Sorting out relative clauses with a purpose interpretation is no easier, for obvious reasons. There is, however, one construction which seems to have an unambiguous purpose interpretation, the complementizer *quo* followed by an adverb in the comparative (Menge, 2000, §551 2).[102] I was able to query for this construction in the PHI corpus using regular expressions. The data collection returned three cases from Classical Latin of LDR in adverbial clauses of this kind, and one of them is given in (269).[103] None of them involved the messenger scenario or similar scenarios.

(269) … pro$_i$ *castella communit, quo facilius, si se$_i$ invito*
fortress.ACC strengthens.IND COMP easy.CPV if REFL.ABL unwilling.ABL
transire conentur, prohibere possit.
cross.over.INF try.SBJV hinder.INF can.SBJV

'He$_i$ strengthens the fortress in order to be able to hinder them more easily if they try to cross over [the river] against his$_i$ will.' (Caes. Gal. 1.8.2)

In this highly complex example, an LDR is found in an absolute ablative within a conditional clause. The conditional clause is itself embedded within a purpose clause explaining the subject's reason for strengthening the fortress.

The fact that LDRs occur in examples like this shows quite clearly that long-distance binding is generally allowed in clauses with a purpose interpretation in Latin. The long-

[101] The facts are are a bit more complex, as the event of the matrix clause is not necessarily an action. In such cases, the AH is the agent of the event that caused *q* (cf. Sæbø, 2012, p. 1433-1434.

[102] Thanks to Dag Haug (p.c.) for making me aware of this construction.

[103] The references to the examples are: B. Afr. 20; Caes. Gal. 1.8.2; Cic. Sen. 80. (There is also one example from late antiquity: Iustiniani Digesta 13.6.5.10).

distance binding in purpose adjunct clauses in messenger contexts is, in other words, completely regular.

Given this, the sender-orientation of LDRs in Type 3 messenger reports as in (266) is entirely expected and can be treated on par with indirect discourse embedded under multiple attitude predicates.

7.2.5 Concluding remarks on messenger reports

I have argued that we can distinguish among three slightly different types of messenger reports, and that, given this distinction, they are less problematic for theory of long-distance reflexivity than they appeared to be at first glance. The first type can be accounted for with a few modifications to the anaphoric and plural semantics. The second type is captured by the event-semantic treatment of UID from the previous chapter. An inferred speech event with the sender as agent must be assumed, but there seems to be good independent support for this inference. Finally, new data collections show that the third type is entirely predicted, as long-distance binding into adjunct purpose clauses is shown to be possible in general in Latin.

This conclusion relies on a crucial assumption: LDRs referring to individual senders have a more restricted distribution than LDRs with group senders. LDRs can refer to individual senders only in UID without an overt utterance predicate (Type 2) or when the utterance predicate itself is embedded within a purpose clause (Type 3). On the other hand, LDRs can refer to a salient group which includes the messenger (Type 1) in any kind of indirect discourse. Because of the lack of native speakers, I do not know of a way of establishing definitely that this assumption holds. However, I am not aware of any counter-examples.

7.3 Residual issues in Latin

7.3.1 *Quod*-clauses with emotive predicates

In this section I discuss a couple of residual issues which have been mentioned in the literature on LDRs in attitudinal environments in Latin and suggest some ways to account for them given the analyses of the last three chapters.

One issue is LDRs in subordinate clauses with the complementizer *quod* 'because', cf. subsection 2.3.2. This complementizer is generally used for causal adjuncts. However, it is particularly frequent with emotive predicates such as *doleo* 'suffer', *gaudeo* 'be glad' and a few other attitudinal predicates, such as *gratias ago* 'give thanks' and *reprehendo* 'blame'. A *quod*-clause with such predicates can either be in the indicative or the subjunctive. Grammars claim that the subjunctive in such examples is *oblique* or *reportive* (Ernout and Thomas, 1953, §304; Menge, 2000, § 542); that is, it reports in some sense on the speech or mind of the subject of the emotive predicate.

LDRs are attested in subjunctive *quod*-clauses to emotive predicates, as in (270) (=(20)). I am not aware of examples in the indicative with such predicates (Solberg, 2011, sect. 1.2.4).

(270) *Decima legio$_i$ ... ei gratias egit [quod de*
tenth legion.NOM him.DAT thanks.ACC conducted.IND because about
se$_i$ optimum iudicium fecisset] ...
REFL.ABL excellent judgement.ACC make.PST.PRF.SBJV

'The tenth legion$_i$ thanked him because he had made such a favourable judgement of them$_i$.' (Caes. Gal. 1.41.2; Benedicto, 1991, ex. (5))

There is disagreement in the literature over whether the *quod*-clause should be considered a complement of the predicate or a causal adjunct when used with such predicates (cf. Benedicto, 1991, fn. 4; Ros, 2001, p. 258-259; Solberg, 2011, p. 22, and Jøhndal, 2012, sect. 3.3.1.1). Some of these predicates are also attested with AcI complements, and there is no clear semantic difference between the two clause types (Menge, 2000, § 542; Jøhndal, 2012, sect. 3.3.1.1). A conceivable argument for taking such clauses to be complements is the fact that they contain LDRs: if it assumed that complementation is relevant for long-distance binding in attitudinal domain, LDR binding into adjunct *quod*-clauses would be unexpected. This assumption was part of the motivation for taking them as complements (Solberg, 2011), and it is crucial to the account of Benedicto (1991). The theory of long-distance binding developed by Jøhndal (2012, sect. 4.4) also has difficulties with these data, as complement-taking predicates play an essential role in the binding of LDRs (cf. subsection 3.4.6).

Based on the findings of this dissertation, it is quite clear that LDR binding cannot be used as an argument for taking these *quod*-clauses as complements. As we saw in subsection 7.2.4, LDRs occur not only in complements with an attitudinal interpretation, but also in attitudinal adjunct clauses such as purpose clauses. Therefore, nothing should prevent LDRs from also occurring in causal adjunct clauses with an attitudinal interpretation. This does not, of course, rule out that there are unrelated arguments for taking them as complements, but LDR binding should not be part of the argumentation.

7.3.2 LDRs and inferred attitudinal events

We saw at the end of subsection 5.4.2 that there are a few predicates in Latin which have somewhat surprising antecedence options given the theory presented in chapter 5. For the following examples, I argued that a purely compositional account was insufficient:

(271)

a. *... cum ei$_i$ nuntiatum esset [quosdam*
when him.DAT announce.PTCP.PRF.NOM was.SBJV somebody.ACC
sibi$_i$ insidiari] ...
REFL.DAT lie.in.ambush.INF

'... when it was announced to him$_i$ that someone was planning an attack on him$_i$ ...' (Nep. Dat. 6.2; Kühner and Stegman, 1976/1997a, p. 609)

b. pro$_i$ ... *[provinciam sibi$_i$ decretam]* *audiet* ...
province.ACC REFL.DAT decide.PTCP.PRF.ACC hear.FUT.IND ...

'He$_i$ will hear that the province has been assigned to him$_i$.' (Cic. Phil. 11.24)

c. *ibi ego$_i$ audivi ex illo$_j$ [sese$_j$ esse Atticum].*
there I.NOM heard.IND from him REFL.ACC be.INF native.of.Attica.ACC

'There I$_i$ heard from him$_j$ that he$_j$ was a native of Attica.' (Ter. An. 927; Jøhndal, 2012, ex. (77), p. 131)

In (271a) (=(152)), an LDR occurs in the complement clause of an impersonal passive, *ei nuntiatum esset* 'it was announced to him that', and the LDR refers to the dative argument. The passivized verb, *nuntio* 'announce', is a standard speech verb which usually only allows LDRs which refer to the utterance agent. The second case is that of *audio* 'hear': Like other acquisition-of-knowledge predicates, *audio* allows subject-oriented LDRs, as in (271b) (=(153a)). However, when an animate source is present, LDRs can pick up that source, as in (271c) (=(24)).

As I argued in subsection 5.4.2, it seems that the binding in (271a) and (271c) exceeds what we can explain with a strict compositional account, and depends in some way on inferred attitudinal eventualities. (271a) implies an acquisition-of-knowledge eventuality by the indirect object, which presumably explains the attested antecedence pattern. Along similar lines, due to the presence of an animate source in examples like (271c), it is easy to infer an utterance event with the source as agent, and this inference is likely the reason why source-oriented LDRs are allowed in such cases.

This situation is not altogether different from that of UID, which does not need to be introduced by an explicit utterance predicate, as long as an utterance event can be inferred from the textual context. The crucial difference, however, is that the clauses containing the LDRs are syntactically embedded in the cases in (271) and do not rely on event anaphora. Therefore, it is somewhat surprising that inferences can influence the antecedence pattern.

I tentatively suggest that some kind of coercion or interpretational readjustment is involved here: the proposition of the complement clause in examples like these can optionally be interpreted relative to some contextually salient event rather than the contentful event of the embedding attitudinal predicate. The complement in (271a) is interpreted relative to the knowledge acquisition eventuality of the indirect object. In (271c) the complement clause is interpreted relative to the inferred utterance of the animate source. Note that in both these cases, the interpretational adjustment is very small: the worlds compatible with the verbal event and the worlds compatible with the inferred knowledge acquisition in (271a) are most likely the same worlds. Similarly, the content of verbal event of *audio* in (271c) and the inferred utterance event of the source are presumably exactly the same. In other words, the adjustment does not affect the truth conditions of the sentences, only the perspective. It is not clear to me at this point precisely how such an interpretational readjustment mechanism should be integrated into the overall theoretical framework and how it should be constrained.[104]

[104](272) is another challenging example which is sometimes mentioned in the literature on Latin LDRs

(Benedicto, 1991, ex. (24); Solberg, 2011, ex. (2.24); Jøhndal, 2012, ex. (78b), p. 131).

(272) *Canum*$_i$ *vero tam fida custodia ... quid significat aliud nisi*
dogs.M.GEN truly so loyal protection.F.NOM what demonstrates.IND other.ACC except
[se$_i$ *ad hominum commoditates esse generatos]?*
REFL.ACC to men.GEN comfort.ACC be.INF create.PTCP.PRF.ACC.M.PL

'The loyal watchfulness of dogs, what does it demonstrate if not that they$_i$ were created for human comfort?' (Cic. N.D. 2.158; Kühner and Stegman, 1976/1997a, p. 609)

The subject of the matrix predicate is *canum ... custodia* 'the watchfulness of dogs'. The LDR in the complement clause is bound by the genitive *canum*, embedded within the subject DP. The agreement facts within the complement show unambiguously that the reflexive has to represent the dogs, not the watchfulness of dogs. This example might involve some sort of interpretational adjustment too, since the LDR is not strictly speaking anteceded by the structurally assigned agent. However, this example seems to involve part-for-whole metonymy: The event involved in "the loyal watchfulness of dogs demonstrates ..." is arguably no different from that of "dogs demonstrate through their loyal watchfulness that..." (cf. Solberg, 2011, p. 28; Jøhndal, 2012, p. 133-134). An additional complication with this example is the signification of the complement-taking verb *significat*. It can mean 'signifies', in which case it is not an attitudinal predicate. This is the translation that seems to be assumed by Benedicto (1991). I previously argued (Solberg, 2011, p. 28-29) that the predicate has the meaning 'demonstrates' in this case, which makes it attitudinal. Jøhndal (2012, ex. (78b), p. 131) translates the verb as 'demonstrates' too. An alternative is that the predicate indeed means 'signifies', and that *custodia* 'watchfulness' has an attitudinal interpretation here. Because of the uncertainties in the interpretation and the lack of comparable examples, I abstain from making any strong suggestions with respect to (272).

Chapter 8

Conclusion

In chapter 3, I argued that a semantic theory of long-distance reflexivity should fulfil four desiderata, repeated below:

Desiderata for a semantic theory of long-distance reflexivity:

DES1 The theory should account for the AH-reference of LDRs in indirect discourse

DES2 It should make sense of the ambiguity of LDRs in deeply embedded indirect discourse

DES3 It should be possible to give an insightful account of LDRs with extra-sentential antecedents

DES4 It should be possible to extend the theory in a plausible way to instances of LDRs in non-attitudinal environments

In this chapter, I will conclude that the semantic theory I have developed in this dissertation meets these desiderata. I will also point out some additional contributions of this project and suggest some possible areas of future research.

DES1 is accounted for through the interaction of the event semantics of perspective shift and the anaphoricity of the LDR. In chapter 5, I argued that perspective shift in attitudinal complements could be modelled using the event semantics of indirect discourse of Hacquard (2006, 2010). I claimed that utterance events and mental states, the event types associated with attitude verbs, have two core properties. First, they are *contentful*, i.e., they have a propositional content. This property is used to derive the modal interpretation of indirect discourse. Second, they are associated with specific thematic roles: an agent in the case of utterance events or an experiencer in the case of mental states. I have used the cover term *conscious participant* for these two thematic roles. In my PCDRT semantics of perspective shift, a dedicated perspectival discourse referent is introduced in the attitudinal complement, assigned to the conscious participant of the selecting attitudinal predicate. This assignment accounts for the AH-orientation of the perspective shift. The LDR is an anaphor with a presuppositional restriction to perspective holders, and can therefore be resolved to the AH-referring perspectival discourse referent in indirect

discourse. In other words, the orientation of perspective shift is given by thematic roles, and the scope by anaphoric accessibility.

The anaphoric approach also satisfies DES2: when an LDR occurs embedded under multiple attitude predicates, there will be several potential antecedents in its accessibility path. In PCDRT, an anaphor has an underspecified resolution, and the ambiguity of an LDR in this position is therefore immediately predicted without positing any kind of structural ambiguity.

An important reason for choosing a dynamic semantic framework is the issue raised in DES3, LDRs with discourse antecedents. In Latin, LDRs can take extra-sentential antecedents in one specific environment, namely UID. Fabricius-Hansen and Sæbø (2004) and Bary and Maier (2014) have argued that the sentences making up a passage of UID are associated with a *reportive presupposition*: they are presupposed to be the content of someone's utterance. In chapter 6 I showed that this presupposition can be reformulated as event anaphora. The sentences that make up a passage of UID are associated with an anaphoric utterance event. By means of anaphora resolution with so-called *bridging relations*, sequences of event-anaphoric sentences can be reinterpreted as one single embedded DRS. When paired with the account of perspective shift, a perspective holder discourse referent becomes accessible in the entire UID.

Event semantics is not the only way of modelling AH-reference in indirect discourse. It is more common to draw on the fine-grained semantics of indirect discourse for this purpose, using, e.g., property abstractors (Chierchia, 1989; Pearson, 2013) or context quantification (Schlenker, 2003). The motivation for going in a different direction in this dissertation is DES4: since LDRs have a use outside of indirect discourse, their referential condition should be modelled independently of the semantics of indirect discourse. In section 5.8, I drafted a proposal for an event-based account of perspective shift and long-distance reflexivity in non-attitudinal environments.

I would like to mention a few additional contributions of this project. The first is of an empirical nature: in chapter 7 I discuss the reference of LDRs in so-called messenger reports in Latin, building on a collection of data already presented in my prior work (Solberg, 2015). When a messenger's words are reported, LDRs tend to refer to the sender of the messengers rather then the messengers themselves, and this has been seen as problematic in previous accounts of long-distance reflexivity in Latin. My data collection suggests that messenger reports fall into three distinct subtypes, each of which can be explained in the present theory with only minor additional assumptions.

The second additional contribution is the treatment of UID. The previous DRT accounts do not use events, but model the reportive presupposition in terms of anaphoric utterance agents and propositions. To make that work, they rely heavily on accommodation. By using anaphoric events and bridging relations, it is possible to resolve the presupposition to an actual discourse antecedent, at least in the Latin cases investigated here.

The third addition contribution highlights an interesting aspect of my semantic framework, PCDRT. PCDRT and CDRT have a type distinction between discourse referents, which have the type of *registers*, and the individuals/events/time intervals etc. which inhabit those registers. In chapter 5, I showed that this distinction can be exploited to

formally mark discourse referents without affecting the truth-conditional semantics, by letting conditions apply to registers instead of to the individual assigned to them. In that chapter, this possibility was exploited to mark particular discourse referents as perspectival, and therefore potential antecedents of LDRs, without making perspective itself part of truth-conditional semantics. In my view, this possibility is an interesting advantage of PCDRT which deserves to be made known.

To conclude, I would like to suggest a few paths for future research. One question left open in this dissertation is the relationship between local and long-distance reflexives. While I have argued that LDRs are anaphors with a presuppositional restriction to perspective holders, local reflexives are presumably syntactically bound and not sensitive to perspective. However, since language after language has reflexive pronouns which are ambiguous in this way, there is presumably a principled reason. An attempt at an explanation which is in part compatible with the present account is that of Reuland (2001).

Another issue which deserves further investigation is cross-linguistic differences in the distribution of LDRs. In languages such as Tamil, Japanese and Latin, LDRs are found both inside and outside of indirect discourse, while they are restricted to indirect discourse in, e.g., Mandarin, and to subjunctive clauses in indirect discourse in Icelandic (Sigurðsson, 1990; Huang and Liu, 2001). I see at least two potential explanations. The first is that there might be differences in the perspectival systems of these languages. Some languages may allow perspective shift in several different environments, while it is more restricted in others. If so, other perspectival expressions should be subject to the same distributional differences. The second possibility is that the difference in distribution is due to differences in the semantics or pragmatics of the LDR itself.

Finally, this dissertation has argued that the referential behavior of LDRs can be captured in an event-semantic approach to perspective shift, and it would be interesting to see how this approach can be applied to perspectival phenomena more generally. Many aspects of linguistic perspective are not well understood, and the jury is still out on how perspective-shifting phenomena should be analyzed. It is my hope that the event-semantic analysis of perspective shift proposed here will contribute to the larger semantic discussion of linguistic perspective.

Appendix A

Semantic details of PCDRT

A.1 Partial type theory

In what follows I provide the formal definitions of the partial type theory of Haug (2013, sect. 4), with a few additions and simplifications. Note that formulations in this appendix follow those of Haug (2013, section 4) closely.

(273) **Types**

a. e is the type for individuals

b. v is the type for eventualities (events and states)

c. i is the type for worlds

d. π_e is the type for individual registers and π_v is the type for eventuality registers (where there is no reason for confusion, I only write π without subscripts)

e. σ is the type for states

f. t is the type for truth values

g. n is the type for integers

h. If α and β are types, then $\langle \alpha, \beta \rangle$ is a type (Haug, 2013, sect. 4.1)

(274) **Syntax**

a. Variables and constants of any type are terms of that type. The type will be written on the term in subscripts when needed for clarity.

b. $\star$ (a constant denoting $\#_t$) is a term of type t

c. $(A_t \ \wedge \ B_t)$, $\neg A_t$ and ∂A_t (Beaver's unary presupposition operator; Beaver, 1992) are terms of type t

d. $A_\alpha = B_\alpha$ is a term of type t

e. $A_{\langle \alpha,\beta \rangle}(B_\alpha)$ is a term of type β

f. $\lambda x_\alpha . A_\beta$ is a term of type $\langle \alpha, \beta \rangle$

g. $\forall x_\alpha.A_t$ is a term of type t

h. $\imath x_e.A_t$ is a term of type e. (Haug, 2013, sect. 4.2)

(275) **Abbreviations**

a. $(A_t \vee B_t)$ for $\neg(\neg A_t \wedge \neg B_t)$

b. $(A_t \rightarrow B_t)$ for $\neg A_t \vee B_t$

c. $A_\alpha \neq B_\alpha$ for $\neg(A_\alpha = B_\alpha)$

d. $\exists x.A_t$ for $\neg\forall x.\neg A_t$ (Haug, 2013, sect. 4.2)

(276) **Semantics - model**

a. The language is interpreted on a set of pairs of domains $\langle D, D'\rangle$ for each type such that:
(i) for base types α the classic domain D_α is a non-empty set where $\#_\alpha \notin D_\alpha$ and the fixed-up domain D'_α is $D_\alpha \cup \{\#_\alpha\}$.
(ii) For functional types $\langle\alpha, \beta\rangle$, the classical domain $D_{\langle\alpha,\beta\rangle}$ is the set of functions $D_\alpha \rightarrow D_\beta$ and the fixed-up domain $D'_{\langle\alpha,\beta\rangle}$ is the set of functions $D'_\alpha \rightarrow D'_\beta$.

b. M is a model consisting of the set of domains as defined in (276a) and an interpretation function $\Im(c)$, which maps constants of each type α to D'_α, and a be an assignment of variables of each type α to elements of D'_α. $a_{\xi/d}$ is the assignment that differs from a only in assigning d to the variable ξ. (Haug, 2013, sect. 4.3)

(277) **Semantics - interpretation**
Given a model M and an assignment a as defined in (276), the language is interpreted as follows:

a. $[[c]]^{M,a} = \Im(c)$ if c is a constant

b. $[[x]]^{M,a} = a(x)$ if x is a variable

c. $[[\star]]^{M,a} = \#_t$

d. $[[(A \wedge B)]]^{M,a} = \begin{cases} \mathbf{T} \text{ if } [[A]]^{M,a} \text{ is } \mathbf{T} \text{ and } [[B]]^{M,a} \text{ is } \mathbf{T} \\ \#_t \text{ if } [[A]]^{M,a} \text{ is } \#_t \text{ or } [[B]]^{M,a} \text{ is } \#_t \\ \mathbf{F} \text{ otherwise} \end{cases}$

e. $[[\neg(A)]]^{M,a} = \begin{cases} \mathbf{T} \text{ if } [[A]]^{M,a} \text{ is } \mathbf{F} \\ \mathbf{F} \text{ if } [[A]]^{M,a} \text{ is } \mathbf{T} \\ \#_t \text{ otherwise} \end{cases}$

f. $[[\partial(A)]]^{M,a} = \begin{cases} \mathbf{T} \text{ if } [[A]]^{M,a} \text{ is } \mathbf{T} \\ \#_t \text{ otherwise} \end{cases}$

g. $[[(A_\alpha = B_\alpha)]]^{M,a} = \begin{cases} \mathbf{T} \text{ if } [[A]]^{M,a} = [[B]]^{M,a} \\ \mathbf{F} \text{ otherwise} \end{cases}$

h. $[[\phi_{\langle\alpha,\beta\rangle}(\psi_\alpha)]]^{M,a} = [[\phi_{\langle\alpha,\beta\rangle}]]^{M,a}([[\psi_\alpha]]^{M,a})$

i. $[[\lambda\xi_\alpha.\phi_\beta]]^{M,a} =$ the function f: $D'_\alpha \rightarrow D'_\beta$, such that for all $d \in D'_\alpha$, $f(d) = [[\phi]]^{M,a_{\xi/d}}$

j. $[[\forall\xi_\alpha.\phi_t]]^{M,a} = \begin{cases} \#_t \text{ if } [[\phi]]^{M,a_{\xi/d}} \text{ is } \#_t \text{ for all } d \text{ in } D_\alpha \\ \mathbf{F} \text{ if } [[\phi]]^{M,a_{\xi/d}} \text{ is } \mathbf{F} \text{ for some } d \text{ in } D_\alpha \\ \mathbf{T} \text{ otherwise} \end{cases}$
(Haug, 2013, ex. (35))

k. $[[\imath x_e.A_t]]^{M,a} = \begin{cases} x, \text{ if there is a unique individual } d \in D_e \text{ s.t. } [[\phi]]^{M,a_{x/d}} = \mathbf{T} \\ \#_e \text{ otherwise} \end{cases}$
(cf. Gamut, 1991a, p. 160)

A.2 The succession of registers

For each register subtype π_α we have a function $\mathcal{L}_{\langle\sigma,\pi_\alpha\rangle}$, which picks out the first uninhabited register of a given state. Since D_{π_α} is well-ordered, we can combine $\mathcal{L}_{\langle\sigma,\pi_\alpha\rangle}$ with a successor function on each register domain $s_{\langle\pi_\alpha,\pi_\alpha\rangle}$: $\mathcal{L}_\alpha(i)$ denotes the first uninhabited register of i of subtype α, $s_\alpha(\mathcal{L}_\alpha(i))$, the second uninhabited α-register of i, and $s^n_\alpha(\mathcal{L}_\alpha(i))$ (s_α applied n times to $\mathcal{L}_\alpha(i)$) denotes the (n-1)-th uninhabited α-register of i. x_{i_1} will from now on abbreviate $\mathcal{L}_e(i)$, the first uninhabited individual register of i, and x_{i_n} will abbreviate $s^{n-1}_e(\mathcal{L}_e(i))$, the n-th uninhabited individual register of i, and e_{i_1} and e_{i_n} are the corresponding event registers (Haug, 2013, p. 477-478).

The abbreviation in (278) is used in PCDRT:

(278) $i[\delta_1...\delta_n]o =_{abbr} \forall\delta.(\delta_1 \neq \delta \wedge ... \wedge \delta_n \neq \delta) \rightarrow v(i)(\delta) = v(o)(\delta)$ (Haug, 2013, ex. (15))

That is, $i[\delta_1...\delta_n]o$ means that state o differs at most from state i in the inhabitants assigned to $\delta_1...\delta_n$.

States and registers are associated with the following axioms (Haug, 2013, p. 478). The axioms are defined with respect to individuals and individual registers here, but they also hold *mutatis mutandis* for events and event registers.

(279) **Axioms**

a. $\exists s.\forall\delta.\neg\exists e.v(s)(\delta) = e$

b. $\forall s.\forall e.\exists s'.s[x_{s_1}]s' \wedge v(s')(x_{s_1}) = e$

c. $\forall s.\forall\delta.\forall\delta'.(\exists e.v(s)(\delta) = e \wedge \delta' < \delta) \rightarrow \exists e'.v(s)(\delta') = e'$

(279a) ensures that we have an empty state, in which all registers are uninhabited. According to (279b), for any state and individual, there is a different state in which the given

individual is assigned to the first uninhabited register of the given state. Consequently, all combinations of registers and individuals are possible. (279c) guarantees that if a register is inhabited, so are all lower registers; there are no gaps among inhabited registers (cf. Haug, 2013, exs. (37) and (38)).

Appendix B

Anaphora resolution

B.1 Standard anaphora

This appendix spells out the anaphora resolution mechanism assumed in this dissertation until chapter 6. In that chapter, anaphora with bridging resolutions is introduced, which requires a more complex mechanism. A resolution mechanism which includes bridging is spelled out in appendix B.2. The resolution mechanism given here is a slightly simplified version of that of Haug (2013, sect. 5.4).

The anaphora resolution function $\mathcal{A}$ is a complex function which relies on the function $\mathcal{R}$, mapping from the word index of an anaphoric word to the word index of its antecedent. An indexing of linguistic tokens is assumed in the input to semantics, assigning a unique number to every token. Example (81) has the following indexing:

(280) Pedro_1 is_2 in_3 a_4 bar_5. Every_6 woman_7 who_8 ever_9 dated_{10} a_{11} man_{12} despises_{13} him_{14}. He_{15} is_{16} sad_{17}.

$\mathcal{R}(14)$ should either map to index 1 or 11, the two possible antecedents of the anaphor. But as this point, accessibility does not constraint $\mathcal{R}$, as it does not interact with the semantic structure at all. To enable such interaction, the injective functions $\mathcal{I}_s$ and $\mathcal{I}_s^{-1}$ are added. $\mathcal{I}_s$ maps a register inhabited in a state s to the index of the token introducing that register. $\mathcal{I}_s^{-1}$ maps from an index to the register in s which that index introduces.

Based on these three functions, we can formulate a complex function $\mathcal{A}(s)(x_\beta)$, mapping an anaphoric register x in a state s to its antecedent in that register: $\mathcal{I}_s(x_\beta)$ maps to n, the index of the anaphoric token; $\mathcal{R}(n)$ maps to the antecedent's index m; finally, $\mathcal{I}_s^{-1}(m)$ maps to x_α, the antecedent's register in s. $\mathcal{A}(s)(x_\beta)$ is, in other words, an abbreviation for $\mathcal{I}_s^{-1}(\mathcal{R}(\mathcal{I}_s(x_\beta)))$. Since both injective functions are relative to the same state s, $\mathcal{A}$ will only map between registers in the same state. However, anaphora resolution works independently of states, since $\mathcal{R}$ maps between indices.

B.2 Anaphora with bridging

This appendix spells out a slightly modified version of the semantics of anaphora with bridging of Haug (2014b, sect. 4.2). The $\mathcal{B}$ function relies on the following formal ma-

chinery. R must be redefined. Instead of mapping from the index of the token introducing the anaphor to the index of the antecedent (cf. section B.1), it now maps from the index of the anaphor to a pair consisting of the index of the antecedent and the coreference relation between the anaphor and the antecedent:

(281) $\mathcal{R}(\text{index of anaphoric token}) = \langle \text{index of antecedent}, \text{coreference relation} \rangle$

Suppose (219a) has the following indexing:

(282) John_1 walked_2 into_3 the_4 room_5. The_6 window_7 looked_8 out_9 on_{10} the_{11} bay_{12}.

Given this indexing, $\mathcal{R}(6) = \langle 4, \lambda x.\lambda y.in(x, y) \rangle$.

Since $\mathcal{R}$ is redefined, $\mathcal{A}$, which depends on $\mathcal{R}$, must be modified slightly. In the prior formulation, $\mathcal{A}(s)(\delta_{\pi_\alpha}) = \mathcal{I}_s^{-1}(\mathcal{R}(\mathcal{I}_s(\delta)))$ (see section B.1). This is redefined as $\mathcal{A}(s)(\delta_{\pi_\alpha}) = \mathcal{I}_s^{-1}(fst(\mathcal{R}(\mathcal{I}_s(\delta))))$, given a function fst which returns the first element of a tuple. With this modification, $\mathcal{A}$ works exactly as in the previous theory: it maps from anaphoric registers to antecedent registers.

The function $\mathcal{B}$ maps from anaphoric discourse referents to coreference relations, drawing on $\mathcal{R}$. Given a function snd which returns the second element of a tuple, $\mathcal{B}(s)(\delta_{\pi_\alpha}) = snd(\mathcal{R}(\mathcal{I}_s(\delta)))$ (Haug, 2014b, sect. 4.2, with minor tweaks).

The interpretation of the anaphoric condition in (100) can now be reformulated as in (283), where $\mathcal{B}$-rel abbreviates the relation denoted by $\mathcal{B}(s)(x)$ (using infix notation for the sake of readability):

(283) **Interpretation rule for anaphors (with bridging):**
For all register subtypes α, $\forall x_{\pi_\alpha}.\forall s.ant(s)(x) \rightarrow \partial(v_\alpha(s)(x)\ \mathcal{B}\text{-}rel\ v_\alpha(s)(\mathcal{A}(s)(x)) \wedge \mathcal{A}(s)(x) < x)$ (cf. Haug, 2014b, ex. (61))

The inhabitant in a state s of an anaphoric register x is in the relation to its antecedent, $\mathcal{A}(s)(x)$ specified by $\mathcal{B}(s)(x)$.

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