Information structure and reference tracking in complex sentences

An overview*

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This volume is dedicated to exploring the crossroads where complex sentences and information management – more specifically information structure (IS) and reference tracking (RT) – come together. Complex sentences are a highly relevant but understudied domain for studying notions of IS and RT. On the one hand, a complex sentence can be studied as a mini-unit of discourse consisting of two or more elements describing events, situations, or processes, with its own internal information-structural and referential organisation. On the other hand, complex sentences can be studied as parts of larger discourse structures, such as narratives or conversations, in terms of how their information-structural characteristics relate to this wider context.

We first focus on the interrelatedness of IS and RT (Section 1) and then define and discuss the notion of complex sentences and their subtypes in Section 2. Section 3 surveys issues of IS in complex sentences, while Section 4 focuses on RT in complex sentences. Sections 5 and 6 briefly consider IS and RT in a wider discourse context. Section 5 discusses the interaction between IS, RT, and other discourse factors, and Section 6 focuses on ways in which a specific RT system, switch reference, can function as an RT device beyond the sentence.

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1. Information structure and reference tracking

Information structure can be defined as common ground management:[1] speakers use certain linguistic forms in order to signal which aspects of the common ground are relevant at a given point in discourse and what operations are to be performed on the common ground. Common ground is understood in the Stalnakerian sense (Stalnaker 1978), as a set of possible worlds compatible with the propositions mutually accepted by the interlocutors. Assertions constitute updates of this set: every successful assertion adds a proposition agreed to be true by the interlocutors to the common ground. The traditional notions of topic, focus, and contrast can be defined against this background along the following lines: topics determine which part of the common ground stock is going to be enriched by a new proposition, foci indicate which part of the expressed proposition is still not a part of the common ground, so that it is interpreted as potentially controversial and therefore assertion-worthy, whereas contrast implies that there is a limited number of specific alternatives for the expressed topics or foci available in the context.

The second topic of this volume, reference tracking, refers to the capability of the interlocutors to unequivocally determine the referent(s) of a linguistic expression. Reference tracking is successful only if an utterance results in both interlocutors ascribing the same referent value to an expression. What is the common denominator of information structure and reference tracking? Basically, they are both rooted in the notion of common ground, i.e. they depend on the estimation by the interlocutors of what the current status of the common ground between them is. In order to choose the focus of an utterance, the speaker must have a theory of the current state of mind of the hearer, and in order to decode the utterance with a certain focus structure, the hearer must have a corresponding theory of the speaker's mind. Ascription of reference has exactly the same preconditions: in order to be able to linguistically encode and decode a referent felicitously, both the hearer and the speaker have to rely on the assumptions about the current stock of activated referents in their respective minds. The mechanisms of IS and RT thus appear to be remarkably similar.

This said, we do not claim that the encoding and decoding of IS and RT is a purely pragmatic task which is solved online, without anchoring in the grammar. In actual fact, both IS and RT are based on a combination of pragmatic reasoning and the decoding of linguistic signals. There are many well-known examples for this. In many languages, focus marking on the direct object, no matter what the dedicated signal of focus is, is interpreted either as focus on the object or on the verb phrase,

1. Our notion of common ground management draws heavily on Krifka (2008), according to whom it is "concerned with the way how CG content should develop".

depending on the hearer's assessment of the common ground. This is illustrated with two question-answer pairs from Tundra Yukaghir (isolate, northern Siberia), in which focus on the direct object is marked with a dedicated Focus case and with Object Focus agreement on the verb. This grammatical marking limits the possible focus structures to $[O]_{foc}$ and $[OV]_{foc}$, but the choice of either is dependent on discourse (Example (1) from Kurilov 2005: 11.03–04).

(1) *neme-ləŋ iŋeː-məŋ?*
what-FOC fear-OF.1/2SG
$[$*labunmə-ləŋ*$]_{foc}$ *iŋeː-məŋ.*
ptarmigan-FOC fear-OF.1/2SG
'What do you fear? – I fear [ptarmigans]$_{foc}$.'

(2) *tet čiː neme-lə weː-nu-ŋu-mlə?*
you people what-FOC do-IPF-PL-OF.3
Uppulʼə aːwjə [*talaw-ləŋ aji-mələ*]$_{foc}$
Uppulye yesterday wild.reindeer-FOC shoot-OF.3
'How's your family? – Uppulye [shot a reindeer]$_{foc}$ yesterday.'
(DM field data 2010)

Similarly, in many languages, a non-reflexive pronoun indicates that the referent is not co-referent with the subject of the same binding domain (usually the minimal clause), but the actual pairing of the pronoun with a referent is a matter of pragmatics. This is visible in (3), adapted from Erteschik-Shir (1997: 202).

(3) *Peter*$_i$ *heard* [*John*$_k$ *talk about him*$_{i/o}$].

The use of the personal pronoun *him* signals that the referent of the object of the dependent infinitive clause is not identical to its subject (*him≠John*) – a corollary of the well-known Principle B of Binding Theory (Chomsky 1981). Whether it is interpreted as co-referent with the subject of the matrix clause (*Peter*) or as referring to some other referent is a matter of pragmatics.

Grammatical means thus often delimit the possibilities for IS and RT, but the ultimate decoding is a matter of pragmatics. This, however, is not always the case: IS and RT are often exhaustively determined by grammatical means. For instance, in Aghem (Bantoid, Cameroon), the past tense marker *maʾa* can only be used if the truth value of an utterance is being focused (Watters 1979: 161ff).

(4) *Énáʔ máʔá fúo bɛ́ʼkɔ̂ fíŋghɔ́*
Inah PST2.FOC give fufu to friends
'Inah DID give fufu to (his) friends!'

Similarly, a subject gap in certain control constructions can in many languages only indicate coreference with the subject of the matrix clause, as is seen in the following

example from Nepali (Bickel 2003b: 715), where the gap in the complement clause is interpretable only as co-referent with the matrix subject *ma*.

(5) *ma*$_i$ [*Ø*$_i$ *Hindi:* *paḍh-na*] *la:g-ẽ*
I (A-ERG) Hindi.NOM study-INF begin-PST.1SG
'I began studying Hindi.'

IS and RT are not only parts of the same meaning domain and subject to similar procedures of interpretation, they often interact with each other in interesting ways. A famous example is the influence of focusing on pronoun reference resolution (Reinhart 1982).

(6) a. *Felix*$_i$ *hit Max*$_k$ *and then Bill hit him*$_k$.
b. *Felix*$_i$ *hit Max*$_k$ *and then Bill hit HIM*$_i$.

As the indices show, the reference assignment for the pronoun *him* in (6a), where it is not focused, is different from the one in (6b), where it is (capitals indicate the position of the main sentence stress). In the former case, the preferred interpretation is that *him* = 'Max'; in the latter case, *him* = 'Felix'. While a non-focused pronoun seeks its antecedent in the argument with the same grammatical role in a parallel structure, the focused one does the opposite, since focus implies contrast, which in turn implies change of roles. This type of IS-RT interaction is not restricted to pronominal systems: its role in switch-reference systems in the Papuan and Oceanic languages is dealt with extensively in some of the papers in this volume (Hammond, Reesink). Similarly, the way reference is resolved can often have an impact on the interpretation of IS – recall, for instance, Lambrecht's (1994) dictum that the default interpretation of an anaphorically bound pronoun is that of a topic.[2]

The discussion above has shown that IS and RT have a range of possible linguistic realisations, from full underspecification via partial grammatical specification to full grammatical encoding; it has also emphasised the similarity and interaction between IS and RT. Both issues play a prominent role in this volume, which strives to describe the mechanisms of IS and RT, as well as the interplay of these two phenomena, in complex sentences.

2. Complex sentences

Analyses of complex sentences must encompass two interacting concepts: first, the nature of the units that make up the complex sentence, and second, the syntactic

2. See Van Valin (1990) for a survey of theories of information structure and pronominalisation.

relationship between the units. In the generative tradition the first has been controversial, but not the second. Chomsky has maintained since the early 1970s that the units that make up complex constructions must have a subject-predicate structure, be they small clauses, S/IP/TP, or S-bar/CP. Other approaches, e.g. Lexical-Functional Grammar (Bresnan 2001) and Head-driven Phrase Structure Grammar (Sag & Wasow 1999), have recognised VPs as a unit in certain types of complex constructions. In order to take as theory-neutral a perspective on the units that constitute complex constructions as possible, we will include all of the units proposed above, acknowledging VPs as controversial.

Uncontroversial, however, is the traditional distinction between subordination and coordination, which most approaches assume uncritically. Nevertheless, the distinction reflects a continuum rather than a binary opposition. Coordination is typically considered to be instantiated by a construction involving a coordinate conjunction, i.e. X and Y, where X, Y are units of the same type, e.g. phrases (7a) or clauses (7b).

(7) a. *The tall man and the short woman went to the party.*
b. *The tall man went to the party, and the woman went shopping.*

Coordination need not involve a conjunction; many languages have paratactic coordination, which involves the juxtaposition of two phrases or clauses, as in the following example from Yidiɲ (Dixon 1977). (Clause boundaries are indicated by '/'.)

(8) *ŋayu* *guri:li-Ø* *gala-:* *baga-:li-ɲu* /
1SG.NOM wallaby-ABS spear-INS spear-go-PST
miɲa-Ø *badya-:ɽ* / *biɽi* *gundyi-:ɲ*
animal-ABS leave-PST PRT return-PST
'I went and speared a wallaby with a spear, [then] left the meat [lying there] and went home.'

Subordination is typically considered to involve embedding and therewith a dependency of the linked unit on the linking unit. It is useful, following Role and Reference Grammar (RRG) (Van Valin 2005), to distinguish daughter subordination, which is typical of arguments, from ad-subordination (Bickel 1993, 2003a), which is typical of modifiers such as adverbial clauses and relative clauses. The contrast is represented schematically in (9).

(9) a. daughter subordination:
John knows that Bill stole the money.
a′. [$_{\text{MAIN}}$ *John knows* [$_{\text{SUB}}$ *that Bill stole the money*.]]
b. *That Bill stole the money surprised the police.*
b′. [$_{\text{MAIN}}$ [$_{\text{SUB}}$ *That Bill stole the money*] *surprised the police*.]
c. ad-subordination:
John confronted Bill after the police arrived.
c′. [[$_{\text{MAIN}}$ *John confronted Bill*] [$_{\text{SUB}}$ *after the police arrived*.]]

In (9a) the subordinate clause functions as a core argument of the verb in the main clause and is structurally a daughter of the node dominating the main clause. In (9b), on the other hand, the ad-subordinate clause is an adjunct modifier of the main clause and is not directly embedded in it. This contrast also holds for NP-internal subordination, as exemplified in (10).

(10) a. daughter subordination:
John believed the rumour that Bill stole the money.
a′. *John believed* [$_{NP}$ *the rumour* [$_{SUB}$ *that Bill stole the money*.]]
b. ad-subordination:
John believed the rumour about Bill which Mary told him.
b′. *John believed* [$_{NP}$ [*the rumour about Bill*] [$_{SUB}$ *which Mary told him*.]]

How can the embedded nature of a subordinate unit be established? Let us look at daughter subordination first. The canonical instance of daughter subordination is the use of a phrase or clause as a core argument of a predicate, and these phrases have certain syntactic properties, in particular they can become the subject of a passive construction, if functioning as direct object, and they can be it-clefted. This is illustrated in (11)–(13).

(11) a. *Bill bought the new book by S. Collins.*
b. *The new book by S. Collins was bought by Bill.*
c. *It was the new book by S. Collins that Bill bought.*

Clausal arguments have this property as well.

(12) a. *Sam believed that Bill stole the money.*
b. *That Bill stole the money was believed by Sam.*
c. *It was that Bill stole the money that Sam believed.*

Gerunds also have this property.

(13) a. *Mary regretted kissing Bill the most.*
b. *Kissing Bill was regretted by Mary the most.*
c. *It was kissing Bill that Mary regretted the most.*

Thus, clausal complements and gerunds have the same distributional properties as simple core NP arguments, which are unequivocally embedded, and accordingly they exemplify daughter subordination.

What about infinitival complements? The standard analysis of sentences like (14a) is that the infinitive is the embedded object of the verb, just like the simple NP in (14a′), yet it does not have the distributional properties of simple NPs.

(14) a. *Sam tried to open the door.*
a′. *Sam tried the door.*
b. **To open the door was tried by Sam.*
b′. *The door was tried by Sam.*

c. **It was to open the door that Sam tried.*
c′. *It was the door that Sam tried.*

The contrast between (13) and (14) is striking: in both the linked unit is subjectless, non-finite and sub-clausal, but the gerund shows the same properties as a simple NP object, whereas the infinitive does not. The infinitive cannot be passivised, nor can it be it-clefted. Hence the infinitive *to open the door* cannot be analysed as the direct object of *try* and therefore not as daughter-subordinate in (14a). This is an instance of a syntax-semantics mismatch: at the semantic level, *x to open the door* is the second argument of *try*, whereas in the syntax it does not occupy a syntactic core argument position, unlike a simple NP as in (11) and (14a′), the gerund in (13) or the *that*-clause in (12). Exactly how this would be described structurally would depend on one's theory, and it is beyond the scope of this introduction to explore this question.[3] However, it is clear that while the infinitive is dependent on the finite unit for its tense and its subject, it is not embedded as a core argument in it; in other words, it is a flat structure. Thus, dependence does not necessarily entail daughter subordination.

A similar contrast can be found in Japanese. The verbs *kuyam-* 'regret' and *kokoromi-* 'attempt' take a subordinate clause complement, and it is passivisable, analogous to the English example above.[4]

(15) a. *Hanako-wa Hirumi-ga shiken-ni ochi-ta*
Hanako-TOP Hirumi-NOM exam-DAT fail-PST
koto-o kuyan-da
event-ACC regret-PST
'Hanako regretted (the fact) that Hirumi failed the exam.'

a′. *Hirumi-ga shiken-ni ochi-ta koto-ga*
Hirumi-NOM exam-DAT fail-PST event-NOM
Hanako-niyotte kuyam-are-ta
Hanako-by regret-PASS-PST
'That Hirumi failed the test was regretted by Hanako.'

b. *Taroo-wa doa-o ake-ru koto-o kokoromi-ta*
Taroo-TOP door-ACC open-NPST event-ACC attempt-PST
'Taroo attempted opening the door.' [literally: 'Taroo attempted that he opens the door.']

3. See Van Valin (2005), Section 6.2, for an analysis of these structures in terms of the RRG theory of complex sentences. Roberts (2012) argues that English constructions like (8a) should be analysed as a type of serial verb construction.

4. Data are from Kiyoko Toratani, personal communication.

b′. *doa-o* *ake-ru* *koto-ga* *Taroo-niyotte* *kokoromi-rare-ta*
door-ACC open-NPST event-NOM Taroo-by attempt-PASS-PST
'Opening the door was attempted by Taroo.' [literally: 'That he opens the door was attempted by Taroo.']

With both verbs the complement clause is finite and is marked by *koto* 'fact, event', which in turn carries accusative case, indicating that the clause is a core argument of the main verb. These are both instances of daughter subordination. It should be noted that Japanese lacks a construction with the properties of it-clefts in English, so that test cannot be applied to the Japanese data.

The closest analogue to the construction in (14) in Japanese is given in (16); it is a serial verb construction. Passivisation is impossible, either in the serial verb form or when turned into a complement clause by *koto*.

(16) a. *Taroo-wa* *doa-o* *ake-wasure-ta*
Taroo-TOP door-ACC open-forget-PST
'Taroo forgot to open the door.'

b. **doa-o* *Taroo-niyotte* *ake-wasure-rare-ta*
door-ACC Taroo-by open-forget-PASS-PST
'To open the door was forgotten by Taroo.'

b′. **doa-o* *ake-ru* *koto-ga* *Taroo-niyotte* *wasure-rare-ta*
door-ACC open-NPST event-NOM Taroo-by forget-PASS-PST
'That he opens the door was forgotten by Taroo.'

Toratani (2002) analyses constructions like (16a) as not involving subordination but rather as having a flat structure. *Ake-* 'open' is clearly dependent on *wasure-* 'forget' for the expression of tense, and it also shares its subject with it as well. Thus this construction, like its English analogue in (14a), shows that dependence does not necessarily entail daughter subordination.

Could (14a) be an instance of ad-subordination? Ad-subordinate units are canonically modifiers, as in (17).

(17) a. *Mary talked to Sally after she left the party.*
a′. *Mary talked to Sally after the party.*
a″. *After she left the party, Mary talked to Sally.*
b. *Tom was angry at Sam because he behaved badly at the party.*
b′. *Tom was angry at Sam because of his behaviour at the party.*
b″. *Because he behaved badly at the party, Tom was angry at Sam.*

Compare the following data from Amele, a Papuan language (Roberts 1988).

(18) a. *ija* *ja* *hud-ig-a* *eu* *nu,* *uqa* *sab* *mane-i-a*
1SG fire open-1SG-TPST that for 3SG food roast-3SG-TPST
'Because I lit the fire, she cooked the food.'

b. *uqa sab mane-i-a, ija ja hud-ig-a eu nu*
3SG food roast-3SG-TPST 1SG fire open-1SG-TPST that for
'She cooked the food because I lit the fire.'

Ad-subordinate clauses are marked by explicit subordinators, and are often embedded as the object of an adposition, as in (17a), or marked by a subordinator related to an adposition, as in (17b) and (18). A typical property of ad-subordinate clauses cross-linguistically is that they can occur either before or after the main clause that they modify, as shown in (17) from English and (18) from Amele. The infinitive in (14a) does not modify the finite unit; indeed, it was argued above that semantically it is an argument of the verb in the finite unit. Furthermore, there is no explicit subordinator, nor can the infinitive be preposed, i.e. **To open the door Sam tried*. The infinitive in (14a) thus appears to be neither daughter subordination nor ad-subordination, yet it is clearly the dependent unit in a complex sentence.

Thus, we have seen that the dependent unit in certain types of complex sentence is not necessarily subordinate, neither daughter-subordinate nor ad-subordinate. Morphosyntactic dependence is a feature of both embedded and flat structures and not necessarily a valid diagnostic for embeddedness. For constructions in which neither daughter subordination or ad-subordination is clearly appropriate, it would be better to refer to them as 'dependent' or 'linked', and where one wishes to generalise over clauses and sub-clausal units such as VPs or infinitives in a construction, then 'unit' would be the appropriate term.

3. Information structure and complex sentences

There are two ways in which information structure can be viewed in the context of complex sentences, paralleling the structural issues discussed in the preceding section. On the one hand, a complex sentence can be treated as a unit of information (IU) in its own right; dependent elements function as building blocks for the information conveyed by this unit, endowed with the same IS values as constituents of simple sentences. For instance, an adjunct clause can play the role of focus within a complex sentence, as in (19).

(19) [*It was only* [*after I arrived home*]$_{\text{FOC}}$ *that I saw them*]$_{\text{IU}}$.

Some of the papers in this volume observe the interaction between IS and complex structures from this external perspective, in particular those by Van der Wal and Komen. In what follows, this type of IS will be called *external IS* of dependent elements.

On the other hand, dependent elements within a complex sentence are informational units themselves, with a special informational and cognitive status, different

from that of an independent predication. The specific status of dependent elements correlates with their function within the complex sentence, i.e. with the relationship they have with other units of the complex sentence. An example of the internal IS of a dependent element of a complex sentence is topicalisation within a complement clause, as in (20).

(20) *I believe* [*that* [*this book*]$_{\text{TOP}}$ *Mary gave to Paul*]$_{\text{IU}}$.

Aspects of internal IS of dependent elements are the topic of the papers by Laskurain, Matić, Storto and van Putten in this volume. This aspect of IS will be labelled *internal IS* of dependent elements.

IS modulation in complex sentences is often subject to idiosyncratic constraints. This is ultimately a consequence of the dual nature of the components of complex sentences hinted at above. From the viewpoint of information transfer, they are at the same time units of information in their own right and elements of a higher unit of information. Since the amount of information that can be processed in one sentence is limited, this double IS structuring often leads to limitations in IS marking, which grammars of individual languages solve in different ways. It is usually the main clause that is asserted (or questioned), while the subordinate clause is presupposed (in one or another sense of the word), [5] but other informational configurations are also possible, often depending on specific discourse conditions or on lexical factors (Erteschik-Shir 2007). The interdependency of IS, complex syntax and discourse will be illustrated in what follows.

Constraints on IS within complex sentences are observable both from the external and internal perspectives. Also, daughter subordination and ad-subordination involving whole clauses may display IS asymmetries. The combination of these two parameters – external vs. internal perspective, daughter vs. ad-subordination – results in a four-way typology of interaction between IS and complex sentences. In what follows, we present some details of this basic typology.

3.1 External IS in Daughter subordination

Daughter-subordinated clauses can display the same range of IS functions within the complex sentence as non-clausal constituents within a simple sentence. They can be topics, as in *That he is a liar is a well-known fact*. Topical embedded clauses often need a special marking of their IS status. For instance, in Modern Greek, they are always preceded by a definite article and thus nominalised (21).

5. This is considered to be diagnostic of subordination under the very expansive definition proposed in Cristofaro (2003).

(21) [[*to* *oti* *iparx-i* *anerjia*]$_{TOP}$ *ol-i*
DEF.NEUT COMP exist-3SG unemployment all-PL
to *kser-ume*]$_{IU}$
3SG.NEUT know-1PL
'We all know that there is unemployment.'

Focusing of daughter-subordinate clauses is also possible, though it is often subject to specific restrictions, mostly related to the inherent informational status of these clauses. A good example is Hungarian, in which complement clauses can be focused only by means of an expletive demonstrative co-referent with the complement clause in the immediately preverbal focus position. Under a non-contrastive reading of focus – for instance, in out-of-the-blue contexts –, this is possible only for non-factive verbs ((22′a) versus (22′b)) (see de Cuba & Ürögdi 2009, 2010).

(22) *mi* *történ-t*?
what happen-INDF.PST.3SG
'What's up?'

(22′) a. [*János* [*az-t*]$_{FOC}$ *mond-ja,* [*hogy* *havaz-ik*]$_{FOC}$]$_{IU}$
John DEM-ACC say-DEF.3SG COMP snow-INDF.3SG
'John says that it's snowing.'

b. ??[*János* [*az-t*]$_{FOC}$ *sajál-ja,* [*hogy* *havaz-ik*]$_{FOC}$]$_{IU}$
John DEM-ACC regret-DEF.3SG COMP snow-INDF.3SG
intended: 'John is sorry that it's snowing.'

The only context in which complements of factive verbs can be focused is under a contrastive reading (23).

(23) [*János* [*az-t*]$_{FOC}$ *sajnál-ja* [*hogy* *havaz-ik*]$_{FOC}$]$_{IU}$, *nem* *Mari-ért*
John DEM-ACC regret-DEF.3SG COMP snow-INDF.3SG not Mary-CF
'John is sorry that it's snowing, not because of Mary.'

This apparent idiosyncrasy is rooted in the presuppositional properties of dependent elements. The relationship between factive predicates and their complements is such that it is the main predicate that gets focused by default, while the complement is not only presupposed in the truth-conditional sense, but also usually discourse-given. It makes little sense to assert what one's emotional or cognitive relationship to a proposition is if this proposition is not accessible to the hearer (and thus presupposed and given) prior to the assertion. These semantic and pragmatic properties of the complements of factive verbs render them unfocusable, unless they are contrasted with a competing presupposition. This explains the difference between (22′b) and (23). The contrast with an alternative presupposition ('John is sorry because of Mary.') licenses focusing of the embedded clause. If there is no alternative presupposition, focusing is impossible.

None of this applies to non-factive verbs, whose complements can be carriers of the main assertion, if the contexts allows for this, and are thus eligible for the focus position (Jary 2010). Actually, it has been claimed, mostly based on English data, that in the case of main-assertion reading of non-factive complements, like the one in (22′a), the matrix clause is not only informationally, but also syntactically demoted to a parenthetical clause (see Dehé & Wichmann 2010 for an overview).

Different restrictions on external focusability of daughter-subordinate clauses stemming from informational asymmetries seem to be widespread across languages. In this volume, existence of these restrictions is reported for Makhuwa (Van der Wal). The important point is that the lack of external focusability has a decisive impact on the internal IS of daughter-subordinate clauses, to which we turn after presenting external IS in ad-subordination.

3.2 External IS in Ad-subordination

Ad-subordinate clauses are in general less susceptible to the nature of the matrix verb or of the head noun. In most cases, they can be freely assigned topic or focus roles without specific restrictions. The relationship between certain types of ad-subordinate clauses (conditionals) and topicality has been claimed to be universal (Haiman 1978). The possibility of topical interpretation is not restricted to conditionals. Example (24) from Even, a Tungusic language of Siberia, shows that the topic marker *bimi* can be attached to temporal clauses; other types (reason and purpose clauses) have been attested as well. Topicalised ad-subordinate clauses usually serve as scene-setting devices, similar to fronted place and time adverbials (Maienborn 2011), and are usually found in places in discourse in which the spatio-temporal or the argumentative frame changes.

(24) [[*tačịn* *go:-niken* *em-če-le-n* *bimi*]$_{\text{TOP}}$ [*erek* *Tọ:sań*
thus say-SS.CVB come-PST.PTCP-LOC-3SG TOP this Tosany
bimi]$_{\text{TOP}}$ *imte-ridʒi* *deg-el-le-n*]$_{\text{IU}}$
TOP sacrifice-SS.PF.CVB fly-INCH-NFUT-3SG
'When she (the older sister) approached her with these words, Tosany made a sacrifice to the fire and flew away.' (DM field data 2009)[6]

Focusing of an ad-subordinate clause is exemplified with a sentence from Toqabaqita (Oceanic, Solomon Islands; Lichtenberk 2008: 1145), in which the focus particle *na* is attached to the whole reason clause.

6. The Even data in this paper stem from the fieldwork supported by the Volkswagenstiftung, DobeS project on Dialectal and Cultural Diversity among Evens.

(25) [[*uri-a* *bana* *ku* *mataqi* *na*]$_{\text{FOC}}$ *kwasi* *fula*]$_{\text{IU}}$
REAS-3OBJ LIM 1SG.NFUT be.sick FOC 1SG.NEG arrive
'It was because I was sick (and only because of that), that I did not come.'

The possibility of freely focusing ad-subordinate clauses may come as a surprise, given that many types of these clauses (e.g. temporal and reason clauses) are poster children for presupposition triggers (see Levinson 1983: 181ff), and we have seen above that presupposed (and given) complement clauses are difficult to focalise. This is due to the nature of ad-subordination. As Van Valin (2005: 283ff.) shows, the major structural and informational difference between daughter- and ad-subordination is that the former, but not the latter, implies embedding of clauses in the matrix clause and the concomitant integration of propositions. The result of this process is a unified complex proposition, sensitive to the issues of presupposition and givenness of its components. Ad-subordinate clauses do not share this property: they are attached to the main clause with a kind of connector and do not form a complex proposition on a par with daughter-subordinate clauses. The corollary of this is that their internal informational status and the nature of the main predicate do not influence their external focusability, or at least do so to a much lesser extent.

Relative clauses, being a subtype of ad-subordinate clauses, are also freely focusable, similar to simple NP modifiers. The resulting interpretation is usually contrastive, another property they share with focused simple modifiers. Research on lesser known languages indicates that the role the external IS of relative clauses play can be more complex: Komen (this volume) shows that the position of relative clauses in Chechen can influence the IS status of their head noun.

3.3 Internal IS

The extent to which dependent elements of complex sentences can display internal IS is, as we shall see below, often contingent on their external IS, and on various structural, lexical and discourse factors. In other words, the possibility of the expression of the internal IS is often gradual in nature, not an either-or matter. This said, many languages do impose absolute, structure- and discourse-independent restrictions on possible IS configurations in dependent elements. Instructive examples of this are Tundra Yukaghir (see Matić's contribution in this volume) and Aghem (Hyman & Polinsky 2010: 219), in which there is an absolute ban on the use of focus marking in all types of subordinate clauses and in all contexts. The following example is from Aghem.

(26) **ò* *lɨ̀ghà* [*ñɨ́'á* *ǹ* *zɨ́* *kɨ́-bɛ́* *nò*]
he want COMP I eat fufu FOC
intended meaning: 'He wants me to eat the fufu.'
[literally: 'He wants that I eat the fufu.']

This kind of restriction might seem intuitively justified: after all, the main assertive point of complex sentences is contained in the main clause, so that further subdivisions within subordinate clauses seem to be unnecessary or even impossible. This is not the case, both on conceptual and empirical grounds. First, context, lexical and structural factors can effect an informational reversal such that the main assertive point is in the dependent element, not in the main clause. Second, there are languages in which IS marking can and does appear within dependent elements, such as Karitiana (Arikem, Tupian; Brazil), and Avatime (Kwa, Niger-Congo; Ghana), as described by Storto and van Putten, respectively, in this volume. We have to conclude, then, that the unselective exclusion of IS markers from dependent elements in some languages is a language-specific matter, probably rooted in diachrony. Possible internal IS configurations in dependent elements in the likes of Aghem and Tundra Yukaghir are either left underspecified or are expressed indirectly, by other means. The following sections describe the variability of the expression of the internal IS of dependent elements, both by means of dedicated IS markers and indirectly.

3.3.1 *Internal IS in Daughter subordination*

As indicated above, some languages ban IS-marking in daughter-subordinate clauses altogether (Aghem, Tundra Yukaghir). In others, it is possible to assert or question daughter-subordinate clauses, but the felicity of this depends on a number of factors.[7]

(27) a. *John thinks that Mary stole his wallet.*
a′. *What does John think that Mary stole?*
b. *John doesn't think that Mary stole his wallet.*
b′. ??*What does John not think that Mary stole?*

The complement clause in (27a) can be included in the assertion, and this is shown by the possibility of questioning an element in it in (27a′). Since questioning implies focusing, this means that (some) complement clauses in English have a full internal IS, i.e. their components can be focused (and topicalised, see below) in the same way as elements of the main clause. Note that (27a) is based on a non-factive predicate

7. In the discussion that follows, we use extraction data to illustrate our point, well aware that there are alternative, syntax-based accounts of these data (see Boeckx 2012 for an overview). There is compelling evidence that it is not the syntactic feature of extraction *per se* that is responsible for the variable acceptability of extractions. Our Examples (27) and (28) are only a tiny fraction of evidence to this effect -see Erteschik-Shir (1973, 2007), Van Valin (2005), Sections 6.7, 7.6, and Engdahl (1997) for full discussion of the data. Another important fact that points to the relevance of IS in extraction contexts is the presence of the same effects (or at least preferences) as the ones shown in (28) and (29) in the languages in which no extraction takes place, such as Japanese (cf. Example (38) below; see also Shimojo 2002) or Tundra Yukaghir (Matić, this volume).

(*think*), the predicate class we have seen above allows for the informational reversal, in which the main assertive point of the sentence shifts from the main to the subordinate clause.

Adding negation to the main clause as in (27b), however, changes the IS relations, forcing the focus to be on the negated main verb *think* and making the complement clause part of the presupposition, and consequently questioning part of the embedded clause is much less felicitous. This shows that, if the semantic and pragmatic weight of the main clause predicate is raised – by negation, or by employing a more specific verb – the possibility of information reversal and of concomitant explicit marking of the internal IS decreases. This is also visible if one compares (27) with a sentence containing a factive verb as in (28) (cf. Abrusán 2008).

(28) a. *John regrets that Mary behaved badly.*
b. **How does John regret that Mary behaved?*
c. *I regret having got this letter from him.*
d. ??*From whom do you regret having got this letter?*

The sentences in (28) exemplify so-called factive islands, complements of factive verbs from which extraction of certain types of elements is not possible. It can be argued that this restriction is a direct consequence of the default presupposed/given status of these complements, which cannot, except under very specific conditions (such as echo-questions), obtain the status of the main assertion. This, in turn, blocks the expression of their internal IS, as indicated by the impossibility of questioning elements within them.

As in the case of the external IS of daughter-subordination, these limitations are pragmatic in nature, i.e. they can be violated under appropriate discourse conditions. One such condition is contrast, which we have seen above is sufficient to allow for external focusing of some otherwise unfocusable dependent clauses. The same principle applies in the expression of the internal IS. The so-called long-distance scrambling in Korean is a good example of this (Vermeulen 2010). Consider sentence (29):

(29) *MOCA-LUL* *Swuni-ka* [*Yenghi-ka*
hat-ACC Swuni-NOM Yenghi-NOM
sasse-ta-ko] *sayngkakhan-ta*
bought-DECL-COMP think-DECL
'It is a HAT that Swuni thinks Yenghi bought.'

The phrase *mocalul* is extracted out of the complement clause for focusing. This configuration is pragmatically severely limited. Sentence (29) is an impossible answer to a simple content question ('What does Swuni think that Yenghi bought?). It is felicitous only in contrastive contexts ('Swuni thinks that Yenghi bought shoes?' – 'No, it's a hat Swuni thinks…').

What possibilities of expression of internal IS in daughter-subordinate clauses exist in those languages that display an absolute ban of focus or topic marking in non-root contexts? The most common method is underspecification. If an embedded element has an internal IS, it is simply left unexpressed, and the hearer has to use their pragmatic reasoning to decode it. If one element of a daughter-subordinate clause is to be interpreted as focused, the internal IS is often left underspecified by externally focusing the whole daughter-subordinate clause. This is similar to the behaviour of focused modifiers of complex NPs in English clefts. If one wants to focus the modifier in the phrase *the red car,* it is impossible to say **It was the red that I bought car*. Instead, the variant with a continuous NP, *It was the red car that I bought* is used, with an underspecified focus on either [the red car] or only [red]. In a similar way, a complement clause can be focused as a whole, allowing for both a narrow focus reading of one or more of its constituents and a broad focus reading of the whole complement clause, as in the following examples from German (30)[8] (Stolterfoht & Bader 2004: 261) and Tundra Yukaghir (31) (see also Zimmermann 2011: 1195ff on similar phenomena in Western Chadic).

(30) *Maria sag-t, [dass die Tante [die* NICHTE-N*]*$_{FOC}$
Mary say-3SG COMP DEF aunt DEF niece-PL
begrüß-t hat]$_{FOC}$
welcome-PTCP have.3SG
'Mary says [that the aunt welcomed the nieces]$_{FOC}$.'
'Mary says that the aunt welcomed the [NIECES]$_{FOC}$.'

(31) *[[eńeː]*$_{FOC}$ *[awjaː]*$_{FOC}$ *kelu-j-oːl-k]*$_{FOC}$ *möri-məŋ*
mother yesterday come-0-STAT.NLZR-FOC hear-OF.1SG
'I heard [that mother arrived yesterday]$_{FOC}$'
'I heard that mother arrived [YESTERDAY]$_{FOC}$'
'I heard that [MOTHER]$_{FOC}$ arrived yesterday.'

Marking topical elements within daughter-subordinate clauses is subjected to similar restrictions. It has been observed (Hooper & Thompson 1973) that many of the syntactic operations connected with topicality, such as topicalisation, are restricted to those complement clauses which represent the main assertive point (cf. Boye & Harder 2007; Dehé & Wichmann 2010). In the terminology of this paper, this means that only those complement clauses which can be externally focused can have an

8. Note that there is an alternative option in German, at least with a matrix verb like *sagen* 'say': if the complementiser is left out, the subordinate clause can get the main clause word order (V2): *Maria sagt, die Tante hat die* NICHTEN *begrüßt*. In this case, the subordinate clause is syntactically marked as the main assertive point of the utterance, and no underspecification of the kind exemplified in (30) is necessary.

articulated internal IS with the topic of the clause singled out. The following example from Hooper and Thompson (1973: 474) illustrates this:

(32) *The inspector explained that* [*each part*]$_{TOP}$ *he had examined very carefully.*

The phenomenon of left dislocation in embedded clauses in Avatime, which falls under the heading of topic marking in daughter-subordination, is described in this volume by van Putten.

3.3.2 *Internal IS in Ad-subordination*

Ad-subordinate clauses are virtually always presupposed and never asserted in the same way as complement clauses can be (see below for some qualifications of this claim). Therefore, the internal IS of these clauses is much less likely to be expressed than in the case of complement clauses, as (33b) shows.

(33) a. *Sally was angry at Bill because he kissed Mary.*
b. **Who was Sally angry at Bill because he kissed*?

Restrictions of this kind have been observed as early as Ross (1967b) and labelled *island constraints*.[9] We will use a phenomenon which cross-cuts the IS/RT domains, restrictive relative clauses, to illustrate the interplay of syntax and IS in the functioning of syntactic islands. The function of restrictive relative clauses in discourse is to provide enough descriptive information for a referent to be uniquely identifiable. In order to achieve this, they must contain descriptive material which (the speaker assumes) is already a part of the common ground between herself and the hearer. The corollary of this is that restrictive relative clauses do not normally constitute a syntactic domain in which assertions can be meaningfully encoded, i.e. they normally cannot host the focus of the sentence. If an assertion-worthy, i.e. potentially controversial, element is placed in the relative clause, then it cannot successfully fulfil its primary function, to help identify the referent of the head noun. Similarly, they are not a good domain for contrastive topics, since these imply a shift in attention and are thus opposed to the identificational functions these clauses have. Accordingly, restrictive relative clauses do not have an internal IS and their individual constituents may not be questioned: as shown in (34b), they cannot contain focus-triggered subject inversion (35) and are ungrammatical with topicalised phrases (36).

(34) a. *Sally talked to the man who bought the house next door.*
b. **What did Sally talk to the man who bought?*

(35) **Sally talked to the man who only rarely do we see.*

(36) **That house I know the man who bought.*

9. Ross's islands comprise, but are not confined to, all ad-subordinate clauses. The constructions in (9b) and (10a) are also islands.

However, many languages disobey these constraints. In some cases, island violations (which amount to overt marking of the internal IS) are possible only under what we have labelled *informational reversal*, i.e. situations in which the main assertive point of the sentence is in the embedded clause. The typical contexts for this are restrictive relative clauses with general and indefinite heads, embedded into sentences with general or easily retrievable matrix clauses. Under these conditions, topicalisation becomes possible, as illustrated by the Danish sentence (37) (Erteschik-Shir 2007: 162), as well as questioning, as shown in the Japanese example (38) (Shimojo 2002: 69).

(37) *det hus kende-r jeg en mand* [*som har køb-t*]
DEM house know-SG I a man REL have buy-PTCP
'I know a man who has bought that house.'

(38) *Mary wa* [*dare ga korosita*] *araiguma o mituketa no?*
Mary TOP who NOM killed raccoon ACC found FP
'Mary found raccoons that who killed?'

Other languages seem to be even more unconstrained with respect to internal IS marking in restrictive relative clauses. The data from Mandarin (Huang 1982) and Tundra Yukaghir (this volume) suggest that, if specific linguistic devices are available in the language, there are no inherent limits to the internal IS in restrictive relative clauses, even though lexical and discourse preferences similar to those described above are also observable in these languages.

There are also cases which contravene the idea of the relevance of the main assertive point for the internal IS. One such case is Karitiana, as described by Storto in this volume, in which the head of the internally headed relative clause regularly carries the same marking as focused constituents in root clauses.[10] If this is not an accidental homonymy, and Storto argues that this is not the case, Karitiana relative clauses deserve a special account in terms of functional motivations for linguistic structures.

3.4 Dependent non-subordinate elements

These asymmetries in IS marking are not found in infinitival constructions like (14a). Rather, they have the information-structural properties of simple sentences like (14′), that is: the whole sentence can be asserted, or individual constituents can be treated as focus, topic or presupposed. Thus, the infinitive in (14a), despite being the dependent unit in the construction, fails to show the expected syntactic or information-structural properties of canonical subordination. The same holds true for many serial

10. Yang (1994) shows that internally-headed relative clauses in Korean can be used to introduce new referents into the discourse and thus to express the main assertive point of the sentence.

verb constructions across languages. In Logba (Kwa, Niger-Kongo; Ghana), there are no restrictions on focusing shared individual constituents, as exemplified in (39) (Dorvlo 2008: 198).

(39) a. *Asafo ó-mí kɔɖiatsya zɔ́ o-vu=é nu*
Asafo SM.SG-take banana go CM-market=DET in
'Asafo took bananas to the market.'

b. *Asafo ká ó-mí kɔɖiatsya zɔ́ o-vu=é nu*
Asafo FOC SM.SG-take banana go CM-market=DET in
'It was ASAFO that took bananas to the market.'

c. *kɔɖiatsya ká ó-mí zɔ́ o-vu=é nu*
banana FOC SM.SG-take go CM-market=DET in
'It was BANANAS he took to the market.'

d. *o-vu=é nu ká ó-mí kɔɖiatsya zɔ́*
CM-market=DET in FOC SM.SG-take banana go
'It was to the market that he took bananas.'

Dependent, non-subordinate elements are thus exempt from the constraints holding for subordinate clauses proper and behave like simple predications. This is in accordance with the representation of these structures proposed in Section 2, according to which they are syntactically flat and semantically integrated into a single proposition and are consequently more similar to simple than to complex clauses.

The intricacies of IS marking in complex sentences are a corollary of the dual nature of their component clauses, which are at the same time information units themselves and elements of a higher information unit.

The way information is structured in complex sentences is directly dependent on what component of the sentence is the main assertive point and conveys information which is 'at issue' at the given point in discourse. Somewhat simplified, it can be said that dependent units behave as simple constituents in terms of external IS, though they may be subject to additional restrictions. In terms of internal IS, it appears that only those component clauses that represent the main assertive point, i.e. that are focusable externally, can be informationally articulated. This renders them susceptible to extragrammatical influences from context and lexicon, but also to structural constraints, since focusability is at least partly determined by the grammar (see Section 1).

4. Reference tracking in complex sentences

There are many ways in which reference tracking can take shape in complex clauses, but the basic issue is always this: given two (or more) events coded within the same sentence, how does the language deal with encoding the participants in these two

events, which may or may not overlap? We can set up a typology of RT within complex clauses on the basis of four related parameters: (1) the formal strategy for marking identity/difference, (2) the locus of marking, (3) the domain for referential interpretation, and (4) the nature of the controller and pivot. Cross-cutting these four parameters, however, is a basic issue that relates to the degree of choice. We discuss this first, before going on to the typological parameters, as it will narrow down the types of constructions we are particularly interested in.

4.1 Freedom of referential choice (restricted – unrestricted)

This basic property of RT constructions has to do with whether or not there is freedom of choice in terms of referential organisation for both events. This in turn relates in part to the semantic and grammatical integration or 'tightness' of a construction. Take for instance serial verb constructions (SVCs) which can be defined as "a sequence of verbs which act together as a single predicate, without any overt marker of coordination, subordination, or syntactic dependency of any sort" (Aikhenvald 2006: 1). Prototypically, the verbs of an SVC share at least one argument, often – though not necessarily – in the same syntactic role, normally the subject. This means that the freedom of referential choice for this type of SVC is restricted to possible object arguments. A similar situation exists for certain complementation constructions, where the subject of the matrix verb controls the pivot of the linked unit, independent of the coding strategy, like phasal verbs (*start, begin*), or modals (*can, must*).

In relative clause constructions, the main clause and the relative clause also share an argument, but there is usually much more freedom in terms of the roles they can play in both clauses. Even if a language only allows subject relativisation, the relativised argument will still be able to take on a variety of roles in the main clause.

At the other end of the spectrum, there are constructions where all configurations of participant reference are possible. These include some complement relations, like utterance, cognition, desire, perception relations, and also adverbial and coordinate relations. In this volume, in terms of reference tracking, we are mostly interested in those constructions where there is unrestricted freedom of choice with respect to referential configurations, since in those cases issues to do with information management come to the fore.

4.2 Parameter 1 – Encoding strategy (reduction – preservation – addition)

With this parameter we mean marking strategies as compared to independent clauses that are directly related to the referential constellation of the events in the complex sentence. We distinguish three broad strategies: reduction, preservation, and addition.

Reduction involves the deletion of referential elements normally required in an independent clause.[11] For understandable reasons, reductionist strategies mainly occur in situations where there is referential identity between the two clauses or elements making up the complex construction. An example from English is the following coordinate construction.[12]

(40) *John left Berlin this morning and* [*x*] *will arrive in Moscow tomorrow.*

This omission of the subject NP of the second clause in English in coordinate constructions is only possible when the subjects of both clauses making up the coordinate construction are identical.[13] Non-expression, or gapping of identical arguments is also common in adverbial relations, for instance those encoded by participles, in infinitival complements where the matrix verb and linked verb share arguments, as well as in relative clause constructions, whenever arguments are shared between the verbs making up the complex sentence. [14]

A variant that should be mentioned here is in fact in-between a preservation and a reduction strategy: pronominalisation. This phenomenon has received much attention for relative clauses and coordinate clauses, where double expression of a full NP in cases of participant identity is pragmatically highly marked, or perhaps even unacceptable. Instead, languages render the second instantiation of an identical participant with a pronominal form.

Preservation strategies keep everything related to the encoding of participants for all clauses the same as in independent clauses. So a coordinate construction like the one in (40) can be rendered by using a (non-pronominal) preservation strategy as well, but only if the subject arguments are non-identical (*John left Berlin this morning and Bill will arrive in Moscow tomorrow*). Apart from the pronominalisation strategy, there are a number of variations to the preservationist strategy, which are variations on the realisation of the arguments in question.

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11. This is to be understood to refer to sentences out of context, since in larger stretches of texts in pro-drop languages, overt arguments are generally not expressed once they are established at the beginning of the discourse.

12. This is what will later be termed a 'switch-function' RT system, see Section 4.5 below.

13. IS plays a role here, too. Lambrecht (1986, 2000) gives examples which show that a topical subject is a much better controller of a missing subject than a focal one, see Van Valin (2005: 103–4, and Section 3 above).

14. The rules of deletion under identity in English are much more complex than this and go well beyond subjects, but it falls outside the scope of this paper to discuss that. The reader is referred to Haspelmath (2007: 37–45) for an overview of ellipsis in coordinate constructions in English and other languages.

An often observed variety of preservation strategies is the expression of arguments as possessors. Nominalisation is a very common subordination strategy (see e.g. Cristofaro 2003) which allows for the preservation of the argument structure in various ways, either by encoding the agent and/or the patient of the event as possessors, or by deriving a nominal form that refers to one of the arguments of the verb (participant nominalisation). In many languages, these participant nominalisations can function as relative clauses. There are further variations to preservation strategies, which will be discussed under the heading of referential interpretation domains (Section 4.3).

Addition strategies include an additional element (often a dependency marker) to one or more of the clauses making up the complex sentence which goes beyond the argument structure of that particular clause, as it refers to or is determined by the arguments of one of the other clauses. An example comes from Yurakaré, which preserves the expression of both arguments (minimally in the form of bound pronouns as in (41) and optionally also as overt NPs), and adds an element to (usually) the first of the clauses indicating whether the subject of the next clause is the same or not, even in situations where the subjects are identical (Van Gijn 2011: 172), marked by the enclitic *=ja* (see also this volume).

(41) *bali-tu=ja* *deche-tu* *yosse* *wowore*
go.PL-1PL.S/A=SS meet;find-1PL.S/A again snake
'When we went away, we found the snake again.'

The three different strategies discussed are mostly not equivalent for identity and non-identity relations. Reductionist and semi-reductionist strategies like gapping and pronominalisation are typically employed in identity relations, whereas preservationist strategies predominantly occur in non-identity relations. Additive strategies are an interesting category in this respect, since they are found both for identity and non-identity relations (although probably more for non-identity relations).

4.3 Parameter 2 – Referential interpretation domain (self-contained versus non-local)

The referential interpretation parameter refers to whether or not the interpretation of the referential elements depends on the reference of an argument in another clause within the same sentence.

Gapping and pronominalisation (for third persons) are non-local, because their interpretation is contingent on the interpretation of arguments of another clause. Raising constructions are restricted to complementation constructions, and involve the expression of one of the core arguments of the complement clause in the matrix clause, evidenced by the behaviour of the raised argument in terms of case marking, position in the clause, or cross-referencing on the matrix verb. In terms of referential

interpretation, this construction is akin to gapping, since the raised argument is gapped in the complement clause, and its interpretation therefore depends on the expression of arguments in the matrix clause.

A number of languages allow for long-distance reflexives: one of the arguments of the dependent clause is realised in reflexive form and can refer back to a participant in a higher clause. In the following example from Mandarin Chinese (Cole et al. 2001: xiv), the reflexive element *ziji* may refer back to all three possible antecedents.

(42) *Zhangsan*$_i$ *renwei Lisi*$_j$ *zhidao Wangwu*$_k$ *xihuan ziji*$_{ijk}$
Zhangsan think Lisi know Wangwu like self
'Zhangsan thinks Lisi knows Wangwu likes self.'

In canonical logophoric systems there is a choice for third person subjects of complements of verba dicendi between a co-referent, logophoric pronoun and a non-co-referent pronoun. Logophoric systems are found in African languages in particular, but appear elsewhere, too. The following example is from the Niger-Congo language Igbo (Comrie 1983: 21).

(43) a. *ọ́ sị̀rị̀ nà ọ́ byàrà*
he said that he came
'He$_i$ said that he$_j$ came.'

b. *ọ́ sị̀rị̀ nà yá byàrà*
he said that LOG came
'He$_i$ said that he$_i$ came.'

Deviations from the canonical pattern include logophoric systems that follow an addition strategy, such as in (44) from Gokana (Niger-Congo – Comrie 1983), and a reversal of the markedness pattern (i.e. the pronouns that deviate from the ones used in independent clauses mark non-co-referentiality) called anti-logophoricity in the Western Nilotic language Mabaan in (45), from Creissels et al. (2008), based on Andersen (1999). In some systems, logophoricity extends to other complement relations, but the basis is always indirect speech reports (Stirling 1993).

(44) a. *aè kɔ aé dɔ̀*
he said he fell
'He$_i$ said that he$_j$ fell.'

b. *aè kɔ aé dɔ̀-è*
he said he fell-LOG
'He$_i$ said that he$_i$ fell.'

(45) a. *ʔékè gɔ́kè ʔágē ʔékè kâɲɟé*
he say:ANTIP:3 INIT.3SG swim:FUT:INDIR:3SG
'He$_i$ says that he$_i$ will swim.'

b. *ʔékè gɔ́kè ʔágē ʔéktá kâɲɟé*
he say:ANTIP:3 INIT.4SG swim:FUT:INDIR:4
'He$_i$ says that he$_j$ will swim.'

The special, anti-logophoric pronoun in the latter system is also called fourth person form. This is a potentially confusing term since it is also used for the third person co-referential bound pronouns in a number of Eskimo-Aleut languages, like Central Alaskan Yup'ik.[15] This system has many aspects in common with logophoric systems as well as with long-distance reflexives. In Central Alaskan Yup'ik, a third person in a dependent clause, whether S, A, or O, is marked with special bound pronominal forms if it is co-referent with the subject of the controlling clause. Possessor pronouns also show the alternation co-referent – non-co-referent. This system is illustrated in (46) from Mithun (1999: 73), in which the controller *that dear grandchild* triggers the co-referential forms of the subject pronoun in the reason clause (as well as the possessor pronoun in that reason clause).

(46) *tuai=llu=gguq tauna tutgara-'urlur apa-'urlur-ni*
so=too=HSY that grandchild-dear grandfather-dear-3S.SG/3SG
keneke-nga-miu neqka-nek
love-CNSQ-3R.SG/3SG prepared.food-ABL.PL
assir-lria-nek paivte-ke-ii
good-NLZR-ABL.PL put.out-PTCP.TR-3SG/3PL
'And so that dear grandchild, because she (herself) loved her (own) grandfather, she was setting out good foods [on his plate].'

This system obviously has overlap with the logophoric systems and long-distance reflexives, but there are also differences. Logophoric systems function mainly in indirect speech constructions, and they normally apply to subject co-reference only. The system in Central Yup'ik Eskimo has a more liberal pivot in terms of syntactic roles. The main difference with long-distance reflexives discussed above is that in complex clauses the fourth person refers back to participants in the higher clause, whereas long-distance reflexives can also refer to antecedents within the same domain.[16] Basic reflexivity is expressed by a different construction (Mithun 1999: 47). Nevertheless, it seems reasonable to regard this system as a subtype of long-distance reflexivity. Mithun reports a similar system for Pomoan languages, although they seem closer to logophoric pronouns. A system that comes close to the Eskimo-Aleut system of marking co-reference across clauses has been described for Tupian languages of South America, which often

15. In addition, the term is also used in various traditions in both North and South America to refer to the first person inclusive.

16. Possessors can refer back to an antecedent within the same clause.

have special pronouns (including possessive pronouns) to indicate co-reference with an antecedent, which may be outside the clause of the co-referential pronoun (see the contribution by Galucio in this volume). An interesting difference to its North American counterpart is that, even though many Tupian languages only have a third person co-referent pronoun, the reconstructed paradigm contains co-referential markers for all persons (see Jensen 1999: 147, who reconstructs the proto-forms for the Tupí-Guaraní sub-branch of the Tupian stock).

An often cited definition of switch reference comes from Haiman and Munro (1983: ix): "Canonical switch-reference is an inflectional category of the verb, which indicates whether or not its subject is identical with the subject of some other verb." Instances of canonical (undisputable) switch reference involve an addition strategy for both identity and non-identity relations; they apply in particular to coordinate and cosubordinate relations, rather than to subordinate ones (complementation and relativisation), and have a pivot based on the syntactic category of subject (see parameter 3). Moreover, the identity versus non-identity opposition should apply to functionally and formally identical clause combinations. Nevertheless, there are many systems that are classified as switch reference that do not comply with these canonical features. An example of a canonical switch-reference construction is the following from the unclassified Ecuadorian/Columbian language isolate Cofán (Fischer & Van Lier 2011: 237).

(47) [*khasheye=ndekhu=ja ñoña*]*=si te* [*matachi=ja tsa=ma*
old.man=CLF(PL)=DEF make=DS REP clown=DEF that=ACC
ondikhu]*=pa tsa='ka=en=ja ko'fe='ya*
wear=SS that=CMPR=ADVR=DEF play=MIR
'Reportedly, after the elders made (the clothes), the matachi clown wore them and played like that.'

Long-distance reflexives, logophoricity, and switch reference all involve a form of cross-referencing from one clause to the other in a complex sentence. Stirling (1993: 52–6) discusses the differences between logophoric systems and switch reference:

1. Logophoric systems mark co-reference typically in the pronoun paradigm, switch reference systems prototypically do not.
2. Logophoricity is more limited in terms of contexts in which it can occur.
3. The controlling logophoric pivot can be semantically defined as the source of the utterance (or thought or emotion), quite independently from the syntactic role it has.
4. Logophoric NPs tend to be restricted to third person
5. Co-reference is generally the marked case in logophoric systems, whereas it tends to be the more unmarked case in switch reference.
6. Switch-reference systems often treat inclusive and overlapping reference in two clauses as co-referent, logophoric systems are much less flexible in this respect.

Differences 1, 4, 5, and 6 also set switch reference apart from long-distance reflexivity. Nevertheless, given the deviations from the canonical type for each of these three systems, they are sometimes difficult to distinguish from each other, as the boundaries between them are often not very strict. An interesting question is if one system can give rise to another (see e.g. Comrie 1983 for a case study with a proposal along those lines).

4.4 Parameter 3 – locus of marking (main versus dependent; initial versus non-initial)

This parameter only applies to non-local dependency systems, and refers to the locus of the referentially dependent element. From the perspective of information structure, it is to be expected that referentially dependent elements in complex clauses involving dependency are predominantly found in the dependent rather than the independent clause. Since dependent clauses are typically non-asserted, and so they do not update the common ground (see discussion in Section 1 above), it is expected that the pragmatically dependent clause is also referentially dependent, and the referential 'anchor' is in the part where updates of the common ground are made.

The clauses in a coordinate structure are typically asserted, so in principle the dependent element can be in either clause. The question for coordinate clauses is rather whether the dependent element is in the initial clause or in a non-initial clause. From the perspective of language processing, intrasentential anaphoric linking is preferred over cataphoric linking, since a given antecedent gives immediate access to the referent of the anaphor, and interpretation does not have to be postponed.

This reasoning can be extended to referentially dependent elements in general, leading to the expectation that (i) the referentially dependent element appears in non-asserted dependent clauses; and (ii) the referentially dependent element appears in the non-initial clause (and is preceded by its antecedent).

These expectations are born out in many cases, but there are certainly exceptions. With respect to expectation (i), Bickel (2010), focusing on switch-reference systems, mentions that he is not aware of any reference-tracking device that would be marked on the main rather than on the dependent clause, and cautiously suggests that this might be a universal.

For (semi-)reduction strategies like gapping and pronominalisation, there is more freedom, however. For instance, gaps in relative constructions are usually found in the relative clause, but in languages with internally-headed relative clauses, the gap is in the superordinate clause. Exceptions to expectation (i) may have to do with yielding to expectation (ii). For example, Ross (1967a: 1670–1) observes that, although it is fine to have pronouns in an initial dependent clause, it becomes ungrammatical if the order of the main and dependent clause are reversed (see also Langacker 1969).

(48) a. *Whether he$_i$ plans to leave wasn't made clear by the mayor$_i$.*
b. **He$_i$ didn't make clear whether the mayor$_i$ plans to leave.*

An interesting and testable question concerning head-internal relative clauses is whether there is any correlation with the order of clauses.

Generally speaking, there seem to be more exceptions to expectation (ii). For the reference clause and the marking clause (i.e. the clause containing the referentially dependent element) in switch-reference constructions, Haiman and Munro (1983: xii) observed that "the linear order of the two seems to depend on whether the switch-reference marker is a prefix or a suffix on the verb". In the former case the order tends to be reference-marked and in the latter case the order is reversed. Haspelmath (2007: 40) discusses examples of catalipsis (backward ellipsis) in English and other (mainly European) languages, which most commonly applies to right-peripheral constituents, as in (49), from Haspelmath (2007: 40).

(49) *birds eat* [*x*] *and flies avoid* [*long-legged spiders*]

Catalipsis in the languages discussed by Haspelmath seems to be more restricted than analipsis, but much more cross-linguistic research is needed to determine the extent and the parameters of this phenomenon.

4.5 Parameter 4 – the nature of controllers and pivots: Syntactic, sematic, pragmatic

Controllers and pivots in non-local constructions can have different properties, and this variation can be described in terms of a contrast among syntactic, semantic and pragmatic controllers and pivots. The basic controller-pivot relations are illustrated in (50) and (51).

(50) a. Chris$_i$ slapped Pat$_j$ and then _____$_{i/*j}$ ran away.
CONTROLLER PIVOT
a′. Pat$_j$ was slapped by Chris$_i$ and then _____$_{*i/j}$ ran away.
CONTROLLER PIVOT
b. Chris$_i$ walked up to Pat$_j$ and _____$_{i/*j}$ slapped him$_{*i/j}$.
CONTROLLER PIVOT
b′. Chris$_i$ walked up to Pat$_j$ and _____$_{i/*j}$ was slapped by him$_{*i/j}$.
CONTROLLER PIVOT

(51) a. Chris$_i$ persuaded Pat$_j$ _____$_{*i/j}$ to run away.
CONTROLLER PIVOT
a′. Pat$_j$ was persuaded by Chris$_i$ _____$_{*i/j}$ to run away.
CONTROLLER PIVOT
b. Chris$_i$ persuaded Pat$_j$ _____$_{*i/j}$ to see a doctor.
CONTROLLER PIVOT

b′. Chris$_i$ persuaded Pat$_j$ ____$_{*i/j}$ to be examined by a doctor.
CONTROLLER PIVOT

In these constructions, the pivot is the missing argument in the linked unit, and the controller in the linking unit supplies the interpretation for the pivot; it is the same construction as in (40) above. Both the controller and the pivot in the sentences in (50) are the subject in each clause, whereas the pivot but not the controller is the subject in (51a), (50b) and (50b′). This reflects an important difference in the nature of the controllers. In (50) the choice of which argument is the controller is not determined semantically; as (50a) and (50a′) show, the controller can be either actor, as in (50a), or undergoer, as in (50a′). By contrast, the controller in (51) is semantically determined: it is the undergoer argument, regardless of whether it is syntactically the subject (as in (51a′)) or the direct object (as in the other examples). This follows from the theory of obligatory control (Van Valin 2005: 243). Thus the controller in (50) is a syntactically-defined controller (the subject), while the one in (51) is semantically defined (the undergoer).

It is necessary to further refine the contrast between semantic and syntactic controllers and pivots. In the English constructions in (50), the speaker has a choice with a transitive verb whether to select the actor or undergoer as subject; this is also the case with respect to the pivot in (51). This is not always the case cross-linguistically; in many languages, the choice of argument as pivot or controller is fixed, as it is with the semantic controller in (51), but unlike (51), the selection is not determined by the semantic role of the argument. This is illustrated in (52) from Warlpiri, an Australian Aboriginal language (Andrews 1985); the pivot is indicated by '___'.

(52) a. *ngaju-rlu* ***Ø-rna*** *yankirri-Ø* *pantu-rnu*, ___
1SG-ERG AUX-1SG emu-ABS spear-PST
ngapa-Ø *nga-rninyja-kurra*
water-ABS drink-INF-while
'I speared the emu$_i$ while [it$_i$] was drinking water.'

b. *nyampuju* *wati-Ø* *ka-rla* *nyi-na* *papardi-nyanu-Ø*
this man-ABS PRES-DAT sit-NPST brother-KIN-ABS
karnta-ku, ____ *wangka-nja-kurra-ku*
woman-DAT talk-INF-while-DAT
'This man is the big brother to the woman$_i$ [who$_i$ is] talking.'

c. *karli-Ø* *Ø-rna* *nya-ngu* ____
boomerang-ABS AUX-1SG see-PST
pirli-ngirli *wanti-nyja-kurra*
stone-ELAT fall-INF-while
'I saw the boomerang falling from the stone.'

In (52a) the pivot is the actor of the transitive verb *nga-* 'drink', while in (52b) it is the actor of the intransitive verb *wangka-* 'talk'; but in (52c) it is the undergoer of the intransitive verb *wanti-* 'fall'. So the pivot is the actor of a transitive verb and the single argument of an intransitive verb, regardless of whether the latter is actor or undergoer. What Warlpiri lacks is a voice construction that would permit the undergoer of a transitive verb to be the pivot; it cannot be the pivot in this construction. Thus the pivot in this construction in Warlpiri is invariable but not reducible to a single semantic role, unlike the controller in (51), and therefore it is not a semantic pivot. It is, rather, an invariable syntactic pivot, which contrasts with the English pivots in (50) and (51), which are variable, i.e. with a transitive verb the choice is not fixed.

There is one additional factor relevant to the syntactically-defined, variable controller in (50), namely information-structural factors, specifically topicality. It has long been noted that in some languages subjects are grammaticalised topics (see e.g. Keenan 1976; Givón 1983). This means that when a verb takes an actor and an undergoer and the speaker has a choice as to which one will be selected as subject, one of the factors affecting this choice is the relative topicality of the two arguments, with the more topical one being selected as subject. If one were talking about Chris, then (50a) would be a natural choice, whereas if one were talking about Pat, then (50a′) would be a natural choice.[17] We may refer to such controllers as pragmatically-influenced syntactic controllers.[18]

The pivots in both of these constructions are also not semantically determined, as (50b), (50b′),(51b) and (51b′) show; with a transitive verb either the actor or the undergoer can be the pivot. They are thus syntactic pivots, analogous to the syntactic controllers in (50). However, there is an important difference between the pivots and the controllers in these two constructions: the choice of whether the actor or undergoer is to be selected as pivot in both (50) and (51) is strictly syntactically determined and is not influenced by semantic or pragmatic factors. The argument in the linked unit which functions as pivot must be identical to the controller: if it is an actor, then active voice is obligatory, as in (50b) and (51b), whereas if it is an undergoer, then passive voice is obligatory, as in (50b′) and (51b′). The discourse context has no direct influence on this selection.

Thus, the traditional notion of subject may be divided into controllers and pivots, and these may be syntactic or semantic; with respect to the syntactic controllers

17. See Branigan and Prat-Sala (2000) and Heydel and Murray (2000) for cross-linguistic experimental evidence of a discourse motivation for passives in certain contexts.

18. See Van Valin (2005, 2009) for detailed discussion. In Foley and Van Valin (1984) these were referred to as pragmatic pivots, which gave the impression that they were not syntactic in nature; furthermore controllers and pivots were subsumed under the heading of 'pivot'.

and pivots, they may be variable or invariable, and the variable ones may be pragmatically influenced or not. We have not yet given an example of a semantic pivot or a pragmatically-influenced syntactic pivot; the former will be illustrated in (55) below, while the latter is not relevant to issues of RT. This typology of syntactically privileged arguments, i.e. controllers and pivots, is summarised in Figure 1.

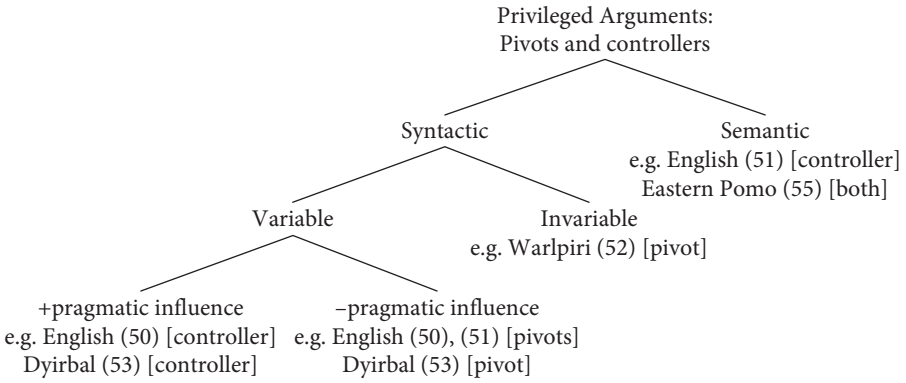

Figure 1. Typology of privileged arguments

Foley and Van Valin (1984) discuss a system to deal with participant (dis-) continuity that is in a way opposed to switch reference, which they term a *switch-function* system. They define a switch-function system as one in which "a particular participant is tracked across clauses, and the verbal morphology in each clause signals the semantic function of that participant in that clause" (Foley & Van Valin 1984: 354). This is the construction in (50), in which the voice morphology in the linked clause signals the semantic function of the controller in (50a) and (50a′) and the pivot in (50b) and (50b′). They contrast this to switch-reference systems, which monitor a particular syntactic or semantic function and signal whether that function is performed by the same participant or not. As an example of a switch-function system, Foley and Van Valin discuss Dyirbal as described by Dixon (1972). These examples show that gapping in Dyirbal is controlled by the absolutive argument. If the absolutive argument of the main clause is co-referential with the ergative argument of the linked clause, it cannot be deleted unless the verb in the linked clause is marked for antipassive, changing the syntactic status of the co-referential argument from ergative into absolutive by demoting the absolutive undergoer to dative status (Foley & Van Valin 1984: 113).

(53) a. *balan* ***ɖugumbil*** *bani-ɲu* *baŋgul yaɽa-ŋgu* *buɽa-n*
woman.ABS come-TNS man-ERG see-TNS
'The woman came and the man saw [her].'

b. **bayi yaɽa bani-ɲu balan* ***ɖugumbil*** *buɽa-n*
man.ABS come-TNS woman.ABS see-TNS
'The man came and saw the woman.'

c. *bayi yaɽa bani-ɲu balan* ***ɖugumbil-gu*** *buɽal-ŋa-ŋu*
man.ABS come-TNS woman-DAT see-ANTIP-TNS
'The man came and saw the woman.'

One of the significant differences between switch-reference and switch-function systems is the nature of the controller and pivot: in a switch-reference system, the pivots and controllers are invariable, while in a switch-function system, the controller is variable and pragmatically influenced and the pivots are variable.

RT systems are typically characterised in terms of a general notion of 'subject'; for example, Haiman and Munro (1983) in their definition of switch-reference cited above posit the subject for canonical switch reference. This fails to capture the fact that 'subjects' in languages with switch-reference system tend overwhelmingly to be invariable syntactic controllers and pivots, which, as we have seen, should be distinguished from the variable, potentially pragmatically-influenced type found in English, German, Malagasy, Dyirbal and many other languages. Valenzuela (2003), for instance, explicitly mentions that the switch-reference system of the Panoan language Shipibo-Konibo, in spite of the ergative case system of the language, functions on the basis of a subject (nominative) controller/pivot. The pivot is in fact more refined than subject, as switch-reference marking is also sensitive to transitivity status (as well as relative time). So the gloss 'PSSA' in Example (54) refers to posterior same subject A argument (subject of transitive clause).[19]

(54) [*jawen tapon bi-xon*] [*kobin-'a-xon*] *naka-kati-kan-ai*
3POSS root.ABS get.PSSA ONOM:boil-do.T-PSSA chew-REM.PST-PL-INC
'After getting its [the Yotokonti plant's] root, they boiled it and chewed it.'

Semantically defined controllers are for instance found in logophoric systems where, as mentioned above, the controller is the source of an utterance, regardless of the syntactic role it has. The controller and pivot of switch-reference systems may also be sensitive to semantic parameters. Foley and Van Valin discuss Eastern Pomo as an

19. In terms of the typology given in Figure 1, Shipibo-Konibo falls into the class of languages with a syntactic, variable pivot. The language has no clear passive and no productive antipassive, but can use a object-to-subject co-reference marker for the same purposes as English uses the passive voice (Valenzuela 2003:428). Dyirbal has a suffix *-ngura* which is used to signal that the missing absolutive argument in a linked clause has the ergative of the previous clause as its controller, which seems to be analogous to the Shipibo-Konibo marker.

example of a language with a semantic controller and pivot that tracks the semantic roles of actor and undergoer (examples from McLendon 1978, cited in Foley & Van Valin 1984: 119–20). The switch-reference morphology signals not just 'same referent' but rather 'same referent with the same semantic role'; in (55c), the first person argument is the actor in the first clause and undergoer in the second, and despite referential identity, the verb carries the 'different subject' marker because of the difference in semantic roles.

(55) a. *há: káluhu-y si:má:mérqaki:hi*
1SG.A go.home-SAME went.to.bed
'I went home and then went to bed.'

b. *há: káluhu-qan mí:p̓ si:má:mérqaki:hi*
1SG.A go.home-DIFF 3SG.A went.to.bed
'I went home and he went to bed.'

c. *há: xá: qákki-qan wi q̓a:lál ṭá:la*
1SG.A water bathe-DIFF 1SG.U sick become
'I took a bath and got sick.'

A good example for a pragmatic controller is Barai, another Papuan language, discussed in some detail by Foley and Van Valin (1984:345–53), based on data in Olson (1978, 1981). The Barai system has a number of parameters, but the following examples show that switch-reference controllers work on the basis of discourse status of referents (Foley & Van Valin 1984: 350).

(56) a. *fu miane sak-i-na barone*
3SG firestick bite-3SG-SMR die
'A firestick bit him and he died.'

b. *miane ije fu sak-i-mo fu barone*
firestick DEF 3SG bite-3SG-DFR 3SG die
'The firestick bit him and he died.'

The same-referent marking in (56a) is triggered by the fact that the actor is indefinite, and therefore, according to Barai rules, is outranked for controller status by the undergoer, which is the unique argument of the intransitive final clause. In (56b), the actor is definite, and therefore favored for controller status over the undergoer.[20]

20. Barai is particularly interesting, because it has pragmatically-influenced variable controllers and pivots, yet lacks a voice system, which is normally a feature of languages with variable privileged arguments. See Van Valin (2009) for discussion of the Barai system.

5. RT, IS, and other discourse factors

How do the facts of RT in complex sentences relate to the facts of IS and complex sentences as discussed in the previous sections? As a general rule, it seems to be the case that more loosely organised complex sentences (coordination, chains, ad-subordination) are more likely to interact with pragmatic factors than tighter constructions (daughter subordination). Switch-reference systems, which are particularly open to pragmatics cross-linguistically have a preference for ad-subordinate, chaining, and coordinate structures (see Haiman & Munro 1983). Given the interrelatedness of switch-reference systems and discourse factors, and given the fact that there is a lot of ground to be covered for a better understanding of the relation between switch reference, information structure and discourse cohesion, these systems deserve special attention from the perspective of this volume.

Since the literature on SR has long been dominated by syntactic considerations, we do not yet have a good overview of the possible pragmatic functions. However, the contributions in this volume that discuss (aspects of) switch-reference systems and related RT strategies show some of the range of these systems, from fully syntactic to more pragmatically driven systems.

Vuillermet discusses RT in ad-subordinate clauses of the Bolivian/Peruvian language Ese Ejja (Takanan). The systems found there are more complex than most SR systems, and they contain parameters that are rare cross-linguistically, but the system can be entirely described in terms of syntactic categories. Galucio shows that the RT system in the Tupian language Mekens, which resembles the fourth-person systems discussed in Section 4.3 above for Yup'ik, functions on the basis of the syntactic notion of subject, independently from sentence topic.

On the other hand, there are systems like the one in Usan. Reesink shows that the switch-reference system of this language can interact with IS in that events with different subjects can be 'ignored' by SR morphology in favour of monitoring the topic of the stretch of text described by a clause chain. Hammond describes that the felicity of the use of so-called echo subject chains in the Oceanic language Whitesands (a special verbal inflection indicating identity of subjects as opposed to default inflection) depends on whether the discourse world allows for it: if there are relatively few potential referents, echo-subject inflection is more likely to be used then when there are relatively many discourse referents.

Different authors have commented on the functional motivation for SR systems to arise, and some of them argue for pragmatic motivation, like topic continuity (Givón 1983), guiding the attention flow (Van Gijn 2012), and inter-event cohesion (Stirling 1993). Overall (this volume), describing morphosyntactically distinct, but functionally similar reference-tracking mechanisms in the Jivaroan language Aguaruna, provides

yet another take on this question. He connects the functionality of head-marked reference tracking (like switch reference) to the fact that topic continuation is expressed by zero anaphora, which makes the NP itself unavailable for reference tracking.

Yet other reference-tracking systems described in the literature are discourse-dependent in other ways, which can often not be stated in terms of reference alone (although it is always part of it). These systems are generally sensitive to different kinds of cohesion between the events. For instance, a number of Quechua languages have three switch-reference markers, two of which mark same subject and one different subject. Often, the difference between the two same-subject markers is unclear, but in the Quechuan language Ancash Quechua, in the analysis of Cole (1983), the two same subject markers *-shpa* and *-r* have taken on slightly different functions, the former marking 'unrelated events', the latter marking related events, in the sense that the event in the *r*-marked clause makes the event in the main clause possible (Cole 1983: 2–3).

(57) a. [*lima-ta* *chaa-ri-r*] *rikaari-shaq* *amigu-u-ta*
lima-ACC arrive-SEQ-SS see-FUT.1 friend-my-ACC
'After arriving in Lima, I will see my friend.'

b. [*chakra-chaw* *urya-shpa*] *pallamu-rqu-:* *wayta-kuna-ta*
field-LOC work-SS pick-REC.PST-1 flower-PL-ACC
'While I worked in the field, I picked flowers.' Or: 'I worked in the field and picked flowers.'

Bickel (2010) reports of systems that are, in addition to reference, sensitive to a shift in location, e.g. in the Papuan language Anghaatiha, data from Huisman (1973).

(58) a. *nimaa-t-osa-té* *nanó-hô*
hang.up-1SG-PRF-SL.SS sleep-1SG.PST
'I hung [it] up and slept.'

b. *nimaa-t-osa-mé* *nun-té* *nanó-hô*
hang.up-1SG-PRF-DLOC.SS go-1SG.SEQ.SLOC.SS sleep-1SG.PST
'I hung [it] up and slept (there).'

In the Barbacoan language Tsafiki, spoken in Ecuador, the switch-reference system functions on the basis of the subject, but this can be overruled by other discourse-related factors, as in (59) where the different-reference (DR) marker indicates that there is an intervening stretch of time between the events (Dickinson 2002: 137).

(59) *junni* [*man=ja-na-sa*] *wata=te* *aman* *chide*
then again=come-PROG-DFR year=LOC now bone
la-ri-bi *man=ji-man-ti-e*
come.out-CAUS.SUF:GENR-PURP again=go-SIT-REP-DECL
'They say then, coming back, after one year he went to take out the bones.'

The range of connections between switch-reference systems and discourse factors is potentially very large and more widespread than was assumed at the time of publication of Haiman and Munro (1983), which has led authors to either argue for a reanalysis of what switch reference is precisely (e.g. Stirling 1993 who argues for an analysis in terms of eventualities), or to argue that some systems that are analysed as switch-reference systems should in fact be regarded as something else, e.g. discourse marking (see Bickel 2010).

6. Switch reference beyond the sentence

In this section we discuss another issue that relates to switch reference and that clearly falls within the scope of this book: how these switch-reference systems function beyond the sentence. This is in some respects parallel to the distinction between internal and external IS discussed in the previous section: SR systems can be described in terms of the complex sentence alone, but marking clauses at the same time are part of a larger discourse context. We will briefly discuss two phenomena that are often found in languages with a switch-reference system, and that are also discussed in several papers in the volume: chaining and tail-head linkage.

Languages can sometimes have long chains of clauses, in which each clause is marked for switch reference, and in which there is one clause that does not have a dependent form (the reference clause). Longacre (2007: 372) regards the organisation of complex sentences as similar to that of the paragraph, but tighter, with more cross-reference between their component clauses and more demarcated. He divides the complex sentence into a margin and a nucleus, the nucleus being the "characteristic" part of a sentence, and "independent of the margin" (Longacre 2007: 373). In a number of chaining languages, chains can function at different levels. He mentions Foré, spoken in Papua New Guinea, where shorter chains can appear within longer chains. Longacre's point is that, within such long chaining structures, shorter, tighter, sentence-like bundles can appear, not from a morphosyntactic viewpoint, but rather from a discourse-organisational perspective. Example (60), taken from Scott (1978: 150) shows a simultaneity clause embedded within a switch-reference sequence, indicated with square brackets in the top line.[21]

(60) [*kanantá* [*'namogá 'mae'túwe*]]
kana-nta-' *na-mu-o'-ki-'* *máe-'tá-u-e*
come-COORD-I me-give-he.PST-CONJ-I get-PST-I-IND
'When I came he gave (it) to me and I took it.'

21. Because of the intricate morphophonology of Foré, an extra line is added to this example with the surface phonology.

Both non-final verbs depend on the final verb for their switch-reference inflection. Compare (60) to (61), where the inflection of the first verb in the chain is determined by the immediately following one, rather than by the final verb of the chain (Scott 1978: 151), analysed by Scott as a flat structure.

(61) [*kanauwá:gana namogá 'mae'túwe*]
kana-uwá:-ki-na na-mu-o'-ki-' máe-'tá-u-e
come-I.PST-CONJ-he me-give-he.PST-CONJ-I get-PST-I-IND
'I came and he gave (it) to me and I took it.'

Another way in which switch-reference systems can function at higher levels than the sentence is by means of tail-head linkage, defined as "a way to connect clause chains in which the last clause of a chain is partially or completely repeated in the first clause of the next chain" (de Vries 2005: 363). Like chaining, tail-head linkage often coincides with a switch-reference system. In this way another kind of chain can be formed, in which it can be indicated on the repeated clause whether there is participant continuation or not. An example comes from the Papuan language Kombai (de Vries 2005: 364).

(62) a. *kha-negena refe fe*
go.3SG.NFUT-until.DS year one
büwene-n-a khumolei
finished.3SG.NF-TRS-DS die.3SG.NFUT
'It went on during one year and then he died.'

b. *khumolei-n-a ifamano*
die.3SG.NFUT-TRS-DS bury.3PL.NF
'He died and they buried him.'

Example (62) is a continuous stretch of text, in which the reference clause of (62a) is repeated and encoded as a dependent clause to the reference clause in (62b). In this way, switch reference can be said to be 'lifted' to a higher, inter-sentential level.

Several contributors (Reesink, Van Gijn, Overall) speak about discourse features as a more specific construction related to SR, i.e. tail-head linkage (THL). In Van Gijn's contribution about the isolate Bolivian language Yurakaré, it is stressed that THL serves not only to 'lift' SR to higher levels than the complex sentence, but also to mark the double function of a proposition on the one hand being part of the (asserted) storyline and on the other forming the presupposed background domain for the next proposition that forms part of the storyline, thus emphasizing text coherence. It is this aspect that is the basis of an extension of THL (including part of the SR system) to narrative-internal sequences of citations in Yurakaré, in which the RT aspects of the SR system cease to be functional as such, and give way to other discourse-related considerations, like discourse cohesion and information structure.

The intersection between complex sentences, information structure, and reference tracking has an extremely rich potential, of which we are only beginning to scratch the surface. In particular we know very little about how lesser-known languages deal with these issues. Therefore we have chosen to focus on contributions from specialists in non-western languages. We hope that this volume provides a good step forward towards a better understanding of the interactions between complex sentences, information structure, and reference tracking.

Abbreviations

A	agent-like argument
ABL	ablative
ABS	absolutive
ACC	accusative
ADVR	adverbialiser
ANTIP	antipassive
AUX	auxiliary
CAUS	causative
CF	causal-final
CLF	classifier
CM	class marker
CMPR	comparative
CNSQ	consequence
COMP	complementiser
CONJ	conjunction
COORD	coordinator
CVB	converb
DAT	dative
DECL	declarative
DEF	definite
DEM	demonstrative
DET	determiner
DFR	different referent
DIFF	different
DLOC	different location
DS	different subject
ELAT	elative
ERG	ergative
FOC	focus
FP	focus particle
FUT	future
GENR	generic
HSY	hearsay
INC	incompletive
INCH	inchoative
IND	indicative
INDF	indefinite
INDIR	indirect mood
INF	infinitive
INIT	initiator of reported speech
INS	instrumental
IPF	imperfective
KIN	kinship
LIM	limitative
LOC	locative
LOG	logophoric
MIR	mirative
NEG	negation
NEUT	neuter
NFUT	non-future
NOM	nominative
NPST	non-past
NZLR	nominaliser
OBJ	object
OF	object focus
ONOM	onomatopoeia
PASS	passive
PCTP	participle
PF	perfective
PL	plural
POSS	possessive
PRES	present
PRF	perfect
PROG	progressive
PRT	particle
PSSA	posterior same subject A argument
PST	past
PURP	purposive

R	coreferential	SM	subject marker
REAS	reason	SMR	same referent
REC	recent	SS	same subject
REL	relativiser	STAT	stative
REM	remote	SUF	suffix
REP	reportative	TNS	tense
S	single argument intransitive verb	TOP	topic
SAME	same	TPST	today's past
SEQ	sequential	TR	transitive
SG	singular	TRS	transitional sound
SIT	situational	U	undergoer
SLOC	same location	1, 2, 3	1st, 2nd, 3rd person

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