Chapter 7: Linking syntax and semantics in complex sentences

7.0 General considerations

In this chapter the linking between semantic representations and syntactic representations in complex sentences is explored. An important question to be investigated is the extent to which the linking algorithms proposed in Chapter 5 for simple sentences must be modified to deal with complex sentences. Most complex sentences pose no particular difficulties for the linking system we developed in Chapter 5. Clausal junctures, for example, are composed of clauses, each of which links like an independent clause. Moreover, nuclear junctures act for linking purposes like simple clauses containing a complex predicate, and they basically follow the algorithms for simple sentences. The real challenge comes from non-subordinate core junctures with their obligatory sharing of a core argument, as discussed in §6.2. Accordingly, linking in clausal and nuclear junctures will be examined first. After the discussion of linking in the different juncture-nexus types and in complex NPs, reflexivization in complex constructions will be investigated, and again the question arises as to the extent to which the principles proposed in §5.2 will have to be modified to deal with these new phenomena. In the final section an account of the restrictions on so-called ‘long-distance dependencies’ involved in WH-question formation, topicalization and relativization will be proposed. These restrictions, which fall under the principle known as ‘subjacency’ in the generative literature, are significant for linguistic theory, for theories of language acquisition and for related theories of cognitive organization.

7.0.1 The semantics-to-syntax linking algorithm

The algorithm for linking semantic representations to syntactic representations for simple sentences which was developed in Chapter 5 is repeated below.

(7.1) Linking algorithm: Semantics $\rightarrow$ Syntax

1. Construct the semantic representation of the sentence, based on the LS of the predicator.
2. Determine the actor and undergoer assignments, following the Actor-Undergoer Hierarchy in Figure 4.4.
3. Determine the morphosyntactic coding of the arguments
   a. Select the PSA, based on the PSA selection hierarchy and principles in (4.13)-(4.14).
   b. Assign the XPs the appropriate case markers and/or adpositions.
   c. Assign the agreement marking to the main or auxiliary verb, as appropriate.
4. Select the syntactic template(s) for the sentence following the principles in (5.2).
5. Assign XPs to positions in the syntactic representation of the sentence.
   a. Assign the [-WH] XPs to the appropriate positions in the clause.
   b. If there is a [+WH] XP,
      1. assign it to the normal position of a non-WH-XP with the same function, or
      2. assign it to the precore or postcore slot, or
      3. assign it to a position within the potential focus domain of the clause (default = the unmarked focus position).
   c. A non-WH XP may be assigned to the precore or postcore slot, subject to focus
structure restrictions (optional).

d. Assign the XP(s) of LS(s) other than that of the predicator in the nucleus to
   1. the periphery (default), or
   2. the precore or postcore slot, or
   3. the left-detached position.

7.0.2 The syntax-to-semantics linking algorithm

The algorithm for linking syntactic representations to semantic representations for simple sentences which was developed in Chapter 5 is repeated below.

(7.2) Linking algorithm: Syntax → Semantics

1. Determine the macrorole(s) and other core argument(s) in the clause.
   a. If the verb is intransitive, then assign the privileged syntactic argument either macrorole or direct core argument status, depending upon the language (language-specific)
   b. If the language lacks voice oppositions, determine the macroroles from case marking and/or word order (language-specific).
   c. If the language has a voice opposition, determine the voice of a transitive verb: (language-specific)
      1. If the construction is syntactically accusative:
         a. If it is the unmarked voice, the privileged syntactic argument is actor.
         b. If it is passive, the privileged syntactic argument is not the actor of the predicate in the nucleus;
            1. The actor may appear as a direct core argument (language-specific); or
            2. The actor may appear in the periphery marked by an adposition or an oblique case (language-specific); or
            3. If there is no actor in the core or the periphery, then replace the variable representing the highest ranking argument in the logical structure with ‘Ø’.
      2. If the construction is syntactically ergative:
         a. If it is the unmarked voice, the privileged syntactic argument is undergoer.
         b. If it is antipassive, the privileged syntactic argument is actor;
            1. The undergoer may appear as a direct core argument or as an oblique element (language-specific).
            2. If there is no undergoer in the core or the periphery, then replace the variable representing the lowest ranking argument in the logical structure with ‘Ø’.
   3. Assign macrorole status to the other direct core argument, if it is not dative or in an oblique case (language-specific).

2. Retrieve from the lexicon the logical structure of the predicate in the nucleus of the clause and with respect to it execute step (2) from (7.1), subject to the following proviso:
   a. If the language allows variable undergoer selection and if there is more than one choice for undergoer, do not assign undergoer to an argument in the logical structure.
   b. Determine the linking of the non-macrorole core argument:
      1. If there is a two-place state predicate in the logical structure and if the non-macrorole core argument is marked by a locative adposition or dative or a locative-type case, then link it with the first argument position in the state predicate in the logical structure and link the other non-actor core argument (if there is one) to the second argument position in the state predicate), or
2. If there is a two-place state predicate in the logical structure and if the non-macrorole core argument is not marked by a locative adposition or dative or a locative-type case, then link it with the second argument position in the state predicate and link the other non-actor core argument (if there is one) to the first argument position in the state predicate.

3. Otherwise, link the animate NP with the first argument position in the state predicate in the logical structure.

3. Link the arguments determined in step 1 with the arguments determined in step 2 until all core arguments are linked.

4. If there is a predicative adpositional adjunct, then retrieve its logical structure from the lexicon, insert the logical structure of the core as the second argument in the logical structure and the object of the adposition in the periphery as the first argument.

5. If there is an element in the pre- or postcore slot (language-specific),
   a. assign it the remaining unlinked argument position in the semantic representation of the sentence.
   b. and if there are no unlinked argument positions in the sentence, then treat the WH-word like a predicative preposition and follow the procedure in step 4, linking the WH-word to the first argument position in the logical structure.

7.1 Linking in clausal junctures

Since clausal junctures are made up of clauses, their linking properties are for the most part determined by the linking properties of the constituent clauses. Consider the following two examples of clausal juncture.

(7.3) a. Dana jogged through the park, and Kim waved to him.
   b. Bill went for a run, after he finished his homework.

In the first example, Dana jogged through the park and Kim waved to him are distinct clauses, and each is linked independently of the other, just as if each were a simple sentence on its own. The fact that there is a pronoun in the second clause referring (possibly) to Dana in the first clause does not affect the linking. The same is true in the (b) example, in which each clause links separately. A simplified logical structure for (b) is given in (7.4).

(7.4) be-after´ ([he finished his homework], [Bill went for a run])

The first logical structure is the argument of after, while the second one is the logical structure of the matrix core, just as in a simple sentence like Sandy presented the flowers to Chris at the party in Figure 5.9. Step 5d1 in the semantics-to-syntax linking algorithm in (7.1) handles the assignment of after + clause to the periphery.

An interesting issue is raised by sentences like the one in (7.5).

(7.5) Kim worked on the assignment in the morning and proi/*j will finish it in the afternoon.

Clausal junctures such as this are found in English topic chains like (4.16a) and in the Tepehua topic chain in (4.21). The traditional name for them in the syntax literature is ‘conjunction reduction’. The logical structure for (7.5) is given in (7.6).
(7.6) \[ \text{be-in}^\prime \text{ (morning, } [[\text{do}^\prime \text{ (Kim}_1, \text{ work.on}^\prime \text{ (Kim}_1, \text{ assignment)})]])] \land \text{be-in}^\prime \text{ (afternoon, } [[\text{do}^\prime \text{ (pro}_1, \emptyset)] \text{ CAUSE [BECOME finished}^\prime \text{ (it)]]})] \]

Only highly topical elements can receive zero coding, and therefore from the point of view of focus structure, constructions like (7.5) involve conjoined predicate-focus or narrow focus constructions in which the privileged syntactic arguments, which are pragmatic controllers and pivots, are topics. The juncture-nexus type of this construction is clausal cosubordination, because illocutionary force must be shared across all conjuncts. This is illustrated in (7.7).

(7.7) a.*Did Kim work on the assignment in the morning, and \text{pro} will finish it in the afternoon?

b.*Kim worked on the assignment in the morning, and will \text{pro} finish it in the afternoon?

In the first example, only the first conjunct is questioned, and the result is ungrammatical, while in the second, only the second conjunct is questioned, which is likewise ungrammatical. The whole sentence must be interpreted either as an assertion or a question, and the most felicitous way to question it is Is it the case that Kim worked on the assignment in the morning and will finish it in the afternoon? The constituent structure representation of (7.5) is given in Figure 7.1. The zero anaphor \text{pro} occupies an argument position in the second clause, just as a non-phonologically null pronoun would; accordingly, the constituent projection of the second clause of (7.5) is the same as for the second clause in Kim worked on the assignment in the morning and she will finish it in the afternoon.

![Figure 7.1: Constituent projection for (7.5)](image)

Since this is a clausal juncture, each of the clauses links separately, but the construction as a whole imposes a constraint on the linking in the non-initial conjuncts: the zero anaphor must occur as the privileged syntactic argument of its clause (see §4.2). This is captured in the constructional template for this construction, which is given in Table 7.1. There are a number of new features in constructional templates for complex sentences. First, there are specifications of the juncture type and the nexus type. Second, there is a specification of the construction type, with an abstract representation of its criterial features. In this case it is the occurrence of \text{pro} in the non-initial conjuncts and the obligatory coreference with the initial pragmatic pivot, which follows from the semantics of the construction. This requires that the semantic representation of each non-initial
clause contains a pro argument. ‘Unit template(s)’ refers to any special properties of the syntactic templates of the constituent clauses, and special linking requirements are also specified.

### Construction: English conjunction reduction

| Syntax: | Juncture: Clausal  
| Nexus: Cosubordination  
| Construction type: Conjunction  
| \([\text{CL} [\text{CORE} \text{NP}_1 [\text{NUC}...[...]]_1, \text{CL} [\text{CORE} \text{pro}_1 [\text{NUC}...[...]]_2, \text{CLM} [\text{CL} [\text{CORE} \text{pro}_1 [\text{NUC}...[...]]_n]] 
| Unit template(s): (5.2)  
| PSA: Clause 1: Variable syntactic controller = pragmatic controller  
| Clause 1+n: Variable syntactic pivot = pragmatic pivot  
| Linking: pro = pragmatic pivot (4.14a, c2)  
| Morphology: | CLM: Coordinating conjunction or disjunction  
| Semantics: | Sequence of events sharing a common primary topical participant  
| Pragmatics: | Illocutionary force: Shared across all conjuncts  
| | Focus structure: Predicate focus in all conjuncts  

Table 7.1: Constructional template for English ‘conjunction reduction’

The template in Table 7.1 may appear to be overly specific in many respects, but it is in fact very general and also represents the essential features of the analogous construction in Tepehua in (4.21). Comrie (1988) discusses this construction in Slavic languages like Croatian, which is a so-called ‘pro-drop language’ (see §1.5), and shows that for coreference purposes it behaves like the English and Tepehua constructions. Hence it would appear that this template would apply to these languages as well. Thus, the constructional template in Table 7.1 can be taken to be the general template underlying ‘topic chains’ in languages.

In the construction in (7.5), the default focus structure is predicate focus, and the construction requires highly topical pragmatic pivots. There is another clausal juncture construction in which the focus structure is just the opposite; that is, in this construction the pragmatic pivot in the second clause must be focal and the remainder of the second clause must be non-focal. Traditionally called ‘VP ellipsis’, it is exemplified in (7.8).

(7.8) a. Kim is eating an ice cream cone, and Sandy is, too.  
b. Sam washed his car, and Bill did, too.  
c. Leslie may go to the concert, and Pat may, too.  
d. Donna has been interviewed by Channel 7, and Pedro will be, too.  
d’. Donna has been interviewed by Channel 7, and Pedro will, too.  
e. Yolanda didn’t see the UFO, and Vanessa didn’t, either/too.  
f. Yolanda didn’t see the UFO, but Vanessa did (*either/too).

All of these sentences have focal stress on the NP in the second conjunct, which is the only element in the constituent projection of the second conjunct. The auxiliary configurations need not be identical in the two clauses, as (d) shows, but when they are different, all of the diverging auxiliary
elements must be present in the second conjunct, as (d’) shows. If the two conjuncts both contain negative operators, as in (e), then either rather than too must be used. If the two clauses have different polarity, as in (f), then neither either nor too can be used. Not only may tense and other operators may be different in the two clauses, but illocutionary force may also be different in each clause. This can be seen in (7.9).

(7.9) Mary is working on the assignment, but is Sam (*either/*too)?

When the illocutionary force is different across clauses, as when polarity is different, neither too nor either can occur. Accordingly, the nexus type is coordination. The syntactic structure of (7.8c) is given in Figure 7.2.

Too is treated as a presuppositional adverb (Soames 1982), and consequently it must be a clausal modifier at the same level as the illocutionary force operator. The new feature of this representation is the constituent projection of the core of the second clause, since it contains only a single argument and the nucleus node dominates nothing and connects directly with its operator projection counterpart. Recall from Chapters 1 and 6 that the constituent and operator projections are mirror images of each other, and accordingly there must be a full layered structure in each, due to the occurrence of a core argument in the constituent projection and at least two clausal operators (illocutionary force and tense) in the operator projection.

The primary complexity in this construction lies in the linking between the syntactic and
semantic representations. In the semantics-to-syntax linking, the elements in the semantic representation of the second clause which are identical to those in the semantic representation of the first clause are not mapped into the syntax. It might appear that this is technically a violation of the Completeness Constraint, since elements in the semantic representation of a clause are not being mapped into the syntactic representation of that clause. It is not, however, as a close reading of the Completeness Constraint reveals. It is repeated in (7.10).

(7.10) Completeness Constraint: All of the arguments explicitly specified in the semantic representation of a sentence must be realized syntactically in the sentence, and all of the referring expressions in the syntactic representation of a sentence must be linked to an argument position in a logical structure in the semantic representation of the sentence.

The crucial phrase is ‘must be realized syntactically in the sentence’; because the semantic information in the second clause is recoverable from the first clause, which is part of the same sentence, the constraint is satisfied.\(^1\)

In the linking from syntax to semantics, the semantic representation of the second conjunct must be projected from the semantic representation of the first conjunct. The semantic representation of the first clause in (7.8a) is given in (7.11).

\[\langle_{IF} DE\langle_{TNS} PRES \langle_{ASP} PROG \langle[do´ (Kim, [eat´ (Kim, ice cream cone))] & INGR eaten´ (ice cream cone))]\rangle\rangle\]

This semantic representation is projected as the semantic representation for the second clause, with a variable replacing the argument corresponding to the privileged syntactic argument of the first clause; this yields (7.12).

\[\langle_{IF} DE\langle_{TNS} PRES \langle_{ASP} PROG \langle[do´ (x, [eat´ (x, ice cream cone))] & INGR eaten´ (ice cream cone))]\rangle\rangle\]

Since there is only one element in the constituent projection of the second clause, it will be linked to the \(x\) argument in (7.12), thereby giving the correct interpretation. When the operators in the two clauses are different, as in (7.8d) and (7.9), then only the logical structure(s) will be projected, as the operators are represented overtly in the clause.

One final complication arises in examples like (7.8b) with respect to the interpretation of the pronoun his. It has long been noted that such sentences are ambiguous, because the second clause can be interpreted as meaning that Bill washed Sam’s car, that Bill washed his own car or that they washed some third party’s car, just as the full, unreduced sentence can. This follows from the fact that the pronoun his, unlike a reflexive, is not constrained to take a particular antecedent, and therefore can refer to any of the possible antecedents. It must be specified, then, that, when the

\(^1\)There also seems to be discourse ‘VP’ ellipsis, as in (i).

(i) Speaker 1: Kim is eating an ice cream cone.
Speaker 2: Sandy is, too.

In this instance the Completeness Constraint would be violated, since Speaker 2’s utterance is a different sentence from Speaker 1’s. While a complete solution to this problem is beyond the scope of this discussion, we can sketch an approach for dealing with it. If there were an explicit representation of the context in which the two utterances in (i) occurred of the kind provided by Discourse Representation Theory (Kamp & Reyle 1993), then the Completeness Constraint could be modified to permit elements in the discourse representation to satisfy it, under the appropriate circumstances.
semantic representation is projected from the first clause, no non-obligatory coindexing is projected. By ‘non-obligatory coindexing’ is meant coindexing not associated with reflexives, which require obligatory coindexing. Hence the semantic representation of the second clause of (7.8b) would be as in (7.13).

(7.13) 〈if \text{DEC} \langle \text{TNS} \text{PAST} \langle \text{do} \, \langle x, \text{[wash} \, \langle x, \text{[have} \, \langle 3\text{sgM}, \text{car} \rangle \rangle \rangle \rangle & \text{INGR} \text{washed} \, \langle \text{[have} \, \langle 3\text{sgM}, \text{car} \rangle \rangle \rangle \rangle\rangle

The 3\text{sgM POSSESSOR} can be construed as coreferential with \(x\), with an NP in the previous clause, or with a discourse antecedent. In the following examples, the coindexing would be projected into the second clause and adjusted to reflect the fact that there is a different privileged syntactic argument in the second clause.

(7.14) a. Dana saw herself, and Sally did, too.
    b. Sam washed his own car, and Bill did, too.

Thus, if (7.15a) is the semantic representation for the first clause in (7.14a), then (7.15b) would be the projected semantic representation for the second clause.

(7.15) a. see\,\langle (Dana_i, \text{herself}_i) \rangle
    b. see\,\langle (x_j, \text{x-self}_j) \rangle

The constructional template for English ‘VP’ ellipsis is given in Table 7.2.

<table>
<thead>
<tr>
<th>CONSTRUCTION: English ‘VP’ ellipsis</th>
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<tbody>
<tr>
<td><strong>SYNTAX:</strong></td>
</tr>
<tr>
<td>Juncture: Clausal</td>
</tr>
<tr>
<td>Nexus: Coordination</td>
</tr>
<tr>
<td>Construction type: Conjunction</td>
</tr>
</tbody>
</table>
| \([\text{CL}, \text{[CORE ...[NUC...]]} ...] \text{CLM} \text{[CL[CORE \text{NP [[NUC]]]] (RDP)}\]
| Unit template(s): Clause 1- (5.2)  |
| Clause 2-PSA only, remainder structurally empty                  |
| PSA: Clause 1: Pragmatic pivot    |
| Clause 2 : Pragmatic pivot        |
| Linking: Voice must the same in both conjuncts.                   |

<table>
<thead>
<tr>
<th>MORPHOLOGY:</th>
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</thead>
<tbody>
<tr>
<td>CLM: coordinating conjunction</td>
</tr>
<tr>
<td>Aux in Clause 2: Default</td>
</tr>
<tr>
<td>ADV in clause 2, if same IF, polarity: too (positive polarity)/either (negative polarity)</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>SEMANTICS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semantic representation of second clause is projected from the first clause:</td>
</tr>
<tr>
<td>(1) The PSA argument is replaced by a variable;</td>
</tr>
<tr>
<td>(2) All operators are projected, except those overtly present in Clause 2.</td>
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<tr>
<td>(3) Obligatory coindexing is preserved.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PRAGMATICS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illocutionary force: Shared across all conjuncts (default)</td>
</tr>
<tr>
<td>Focus structure: PSAs must be focal, remainder of clauses topical</td>
</tr>
</tbody>
</table>

Table 7.2: Constructional template for English ‘VP’ ellipsis
These two constructions, ‘VP’ ellipsis and conjunction reduction, have been taken as evidence for the existence of a VP node in English clause structure, because the part of the clause left in the non-initial conjunct in conjunction approximates a VP and the part of the clause missing in the ellipsis construction also approximates a VP. It has, however, been possible to account for these constructions in terms of the interaction of the layered structure of the clause and focus structure, following the proposal sketched in §3.5.

7.2 Linking in nuclear junctures

Many nuclear junctures have logical structures very much like lexical causative verbs and, not surprisingly, have very similar linking properties. This is particularly true when the linked nucleus in the juncture is intransitive, as in e.g. (6.6a,c). The linking in nuclear junctures becomes more complicated when the linked nucleus contains a transitive verb, as in (6.16b) from French, repeated below as (7.16a).

(7.16)a. Je fer-ai mang-er les gâteaux à Jean.
   1sgNOM make-1sgFUT eat-INF the.Mpl cakes DAT John
   ‘I will make John eat the cakes.’

b. Je fer-ai mang-er les gâteaux par Jean.
   1sgNOM make-1sgFUT eat-INF the.Mpl cakes by John
   ‘I will have John eat the cakes.’

c. [do´ (1sg, Ø)] CAUSE [do´ (Jean, [eat´ (Jean, gâteaux)])] & INGR eaten´ (gâteaux)]

When the linked nucleus contains an intransitive verb, its single argument will be the undergoer. When it contains a transitive verb, on the other hand, the question arises as to which argument will function as undergoer. Since this is a nuclear juncture, the logical structure in (c) maps into a single core. By the Actor-Undergoer Hierarchy, je ‘1sgNOM’ would be actor, and of the remaining two arguments, the patient les gâteaux is clearly the lowest ranking argument with respect to the undergoer end of the hierarchy and therefore will be undergoer. That leaves the effector Jean as a non-macrorole direct core argument, and assuming that French has the same basic case-marking rules as other accusative languages, i.e. the ones in (4.40), it will be assigned dative case, which in French is realized by the preposition à. This accounts for (7.16a), and the linking from semantics to syntax is diagrammed in Figure 7.3.
This basic linking accounts for what Comrie (1976) shows to be the predominant case-marking pattern found in this type of causative construction.\(^2\)

There is a second linking possibility for the logical structure in (7.16c), and it yields (7.16b), in which Jean, the causee, is marked by par, the preposition which marks passive agents in French passive constructions. The difference between the (a) and (b) sentences in (7.16) is more than just the choice of preposition; as in a passive construction, the PP par Jean can be omitted, yielding Je ferai manger les gâteaux ‘I will have the cakes eaten’, or ‘I will have someone eat the cakes’, whereas the dative PP à Jean cannot be omitted. Hence par Jean acts like an adjunct in the periphery, whereas à Jean acts like a core argument. How can this be explained? Nuclear junctures have the logical structure of a transitive verb and therefore have actor and undergoer arguments. When the linked verb is intransitive, it contributes the argument that will function as undergoer. When it is transitive, it likewise contributes the argument that will function as undergoer, but it also contributes another argument which is a potential actor; indeed, if the embedded logical structure were to occur on its own, that argument would be the actor in the clause. What French allows, and what many other languages with this construction do not, is for the embedded transitive logical structure to take two macroroles, just as if it were an independent logical structure. Since the effector of faire ‘make, cause’ is also an actor, a problem arises: how can there be two actors in a single core? The answer is, there cannot be, and accordingly the actor which does not serve as the privileged syntactic argument appears in the periphery marked by par, just as in a passive construction, in which the actor is not a core argument. Which actor functions as the privileged syntactic argument? The actor of the matrix logical structure, that of faire, appears as the...
privileged syntactic argument. This follows from the fact that this actor is the first effector in a causal sequence, and it was argued in §4.5 that the first effector in a causal sequence has priority for actor; in the rare circumstance when there are two actors, as in (7.16b), this principle may be extended to give the actor of the first effector in a causal sequence priority for privileged syntactic argument as well, since, in syntactically accusative languages, the norm is for the highest ranking argument in the logical structure to function as the privileged syntactic argument. This linking is presented in Figure 7.4.

Figure 7.4: Semantics → syntax linking in the French nuclear juncture causative in (7.16b)

It should be clear that the linking from syntax to semantics in both (7.16a,b) can be handled by the linking algorithm in (7.2) without modification.

The constructional template for the French nuclear juncture causative is given in Table 7.3
Table 7.3: Template for French nuclear juncture causative construction in (7.16)

In addition to the syntactic difference regarding the causee in these two constructions, there is a semantic contrast as well, one which is captured somewhat in the English translations by means of the contrast between ‘make’ and ‘have’ as the gloss for faire. Hyman & Zimmer (1976) argue that in the construction in (7.16a) the causee may be interpreted as not acting volitionally, whereas in the construction in (b) the causee may be interpreted acting volitionally. Another way of putting this is that the secondary effector, the causee, can more easily be construed as an agent in (b) than in (a), in terms of the implicature theory of agency proposed in §2.4.1. Thus, par encourages the agent implicature, while à is basically neutral with respect to it. This difference in interpretation is evidence that the PP which is omitted in a sentence like Je ferai manger les gâteaux is par NP, not à NP. The translation is ‘I will have the cakes eaten’ or ‘I will have someone eat the cakes’, not ‘I will make the cakes be eaten’ or ‘I will make someone eat the cakes’, which is the interpretation of causatives with the causee marked by par, not by à.

### 7.3 Linking in core junctures

Neither clausal nor nuclear junctures have required any revision of the linking algorithms in Chapter 5, but some types of core junctures do. There are two basic types of core junctures, subordinate and non-subordinate, each with rather different linking properties. Subordinate core junctures in English are illustrated in (7.17).

(7.17)a. Kim regretted Pam’s dying her hair green.
   a’ . regret(Kim, [[do(Pam, [dye(Pam, her hair)])] CAUSE [BECOME green’ (her hair)])])
   b. That Pam dyed her hair green shocked everyone.
   b’ . [[do(Pam, [dye(Pam, her hair)])] CAUSE [BECOME green’ (her hair)]] CAUSE [feel’(everyone, [shocked’])]

The embedded logical structure links internally independently of the matrix logical structure, but as a whole unit it is part of the linking of the matrix logical structure, because the embedded logical
structure is an argument of the matrix logical structure in the semantics and a core argument of the matrix predicate in the syntax. Thus, subordination at the core level requires no revision of the linking algorithms from Chapter 5. This, however, is not the case for non-subordinate core junctures. In Chapter 6 it was argued that the criterial feature of non-subordinate core junctures is a shared semantic argument between or among the linked cores. This shared argument will require modification of the syntax-to-semantics linking algorithm. The discussion of non-subordinate core junctures begins with control constructions, and then moves on to matrix-coding (a.k.a. ‘raising to subject’, ‘raising to object’, ‘exceptional case marking’) constructions.

7.3.1 Control constructions  Examples of (obligatory) control constructions are given in (7.18).

(7.18)a. Chris tried to see Pat.
    b. Kim persuaded Pat to go to the party.
    c. Robin promised Sandy to wash the dishes.

As discussed in §4.2, there is a syntactic argument missing from the linked core which must be interpreted as being the same as one of the syntactic arguments of the matrix core. The matrix core argument interpreted as being the same as the missing syntactic argument in the linked core is the controller. (7.18a) exemplifies ‘subject’ control, since the controller is the ‘subject’ of the matrix core. The (b) sentence illustrates ‘object’ control, since the controller is the ‘object’ of the matrix core. Finally, the (c) example involves ‘subject’ control. Since ‘subject’ and ‘object’ have no theoretical status in this framework, it is necessary to find an alternative analysis using the appropriate theoretical terms, i.e. syntactic pivot or controller, actor or undergoer.

The theory of obligatory control refers to hypotheses about how the controller of the missing syntactic argument in the linked unit is to be determined. One of the most striking facts about control phenomena is how consistent control properties are across languages, regardless of their typological differences. Van Valin & LaPolla (1997), §9.1.3.1, survey obligatory control constructions in Dyirbal, Lakhota, Sama, Acehnese and Mandarin, and the basic control facts in these languages are the same as in English.

Accounting for the controller in sentences in which there is only one possible controller, such as all of the (a) examples, is trivial. The interesting problem is posed by the control facts in the (b) and (c) examples. All of these sentences involving verbs like persuade and tell have undergoer control. That is, the undergoer of the matrix core is the controller of the missing syntactic argument in the linked core; it is the undergoer of the matrix core which is the shared argument with the linked core, the core argument which functions as a semantic argument in the logical structure of each core. In Foley & Van Valin (1984) it was argued that this follows directly from the semantics of the verbs involved, and in particular from the semantics of causation, which may be represented roughly as in (7.19).

(7.19)Actor acts on Undergoer (by verbal or non-verbal means) → Undergoer does action

In the prototypical case, the actor acts on the undergoer by either verbal or non-verbal means with the intention that the undergoer do some action or be involved in some process or other change. Verbs denoting states of affairs in which the actor acts on the undergoer by non-verbal means are usually called ‘causative’ verbs, e.g. make, force, or cause in English, whereas if the actor uses verbal means, the verbs denoting these states of affairs are called ‘jussive’ verbs, e.g. tell, order, or persuade in English (cf. (6.20)). The resulting theory of obligatory control, proposed originally in
Foley & Van Valin (1984), is stated in (7.20).

(7.20) Theory of obligatory control
1. Causative and jussive verbs have undergoer control.
2. All other (M-)transitive verbs have actor control.

This theory applies to matrix verbs which are (M-)transitive; if the matrix verb is (M-)intransitive, then the single argument will be the controller by default.

This semantically-based theory has numerous positive features. First, it applies without modification to all of the languages we have discussed, regardless of their typological characteristics. That is, because it is stated in terms of macroroles, it applies equally to Sama and to Lakhota, to Acehnese and to Dyirbal, and to Mandarin and to English. Second, it predicts that sentences like (7.18c) should have actor control; that is, verbs like promise are not exceptional in this theory. In terms of (7.20), commissives are neither causative nor jussive and therefore should have actor control. Third, because the control facts are a function of the semantics of the matrix verb, they also carry over into other constructions involving these verbs, as illustrated in (7.21).

(7.21) a. Tom promised Sam that he would wash the car.
    b. Tom persuaded Sam that he should wash the car.

The pronoun he in the that-clause is technically free to refer to either of the NPs in the matrix core or even to a discourse referent, but the preferred interpretations of both of these sentences follows the predictions of the theory of obligatory control: Tom is the preferred antecedent for he in (a), and Sam is the preferred antecedent for he in (b). Fourth, because the choice of the controller is tied to the semantics of the verb, this analysis predicts that if a verb can be used alternatively as causative or non-causative or as jussive or non-jussive, then its control properties should change. This seems to be the case with a number of verbs of saying.

(7.22) a. Larry asked Sally to leave.
    b. Larry made a polite request to Sally that she leave.
    c. Larry requested permission from Sally so that he could leave.

For many English speakers (7.22a) is ambiguous, and the two interpretations are given in (b) and (c). Ask can be construed either as a jussive verb, as in (b), or a verb for requesting something, as in (c); when it has a jussive interpretation, there is undergoer control, as in (b), and when it is non-jussive, there is actor control, as in (c), exactly as predicted. Fifth, because control choices are characterized in terms of macroroles, rather than grammatical relations, the behavior of these verbs under passivization is predicted. Consider the examples in (7.23).

(7.23) a. Pat was persuaded (by Kim) to go to the party.  
    b.*Sandy was promised (by Robin) to help with the party.

Recall that the controller is the syntactic argument in the matrix core which also functions as a semantic argument in the linked core, and this entails that the controller must be a core argument in the matrix core. With a jussive verb like tell or persuade, the undergoer functions as privileged syntactic argument in a passive construction, and since it is a core argument, it continues to function as controller and the resulting sentence is fine, as (a) shows. As Cutrer (1987, 1993) points out,
however, with a non-jussive verb like *promise*, the actor functions as an oblique peripheral constituent, not a core argument, in a passive construction, and consequently there is no core-argument controller in the matrix core; the resulting sentence is therefore ungrammatical, as (b) shows. The fact that ‘subject’-controlled complements cannot be passivized is known in the literature as ‘Visser’s generalization’, and it follows directly from the account of passive in Chapters 4 and 5 and the theory of obligatory control in (7.20).

The theory of obligatory control in (7.20) and the Completeness Constraint in (7.10) play crucial roles in both phases of linking in these constructions. On the syntactic side, the linked core in a non-subordinate core juncture is missing a syntactic argument position, which is the syntactic pivot of the construction. In order to capture the fact that there is a syntactic argument slot missing in the linked core, it is necessary to add a universally-valid qualification to the syntactic template selection principle in (5.2), namely, the occurrence of the core as the linked core in a non-subordinate core juncture reduces the number of core slots by 1. The revised principles are given in (7.24).

(7.24)a. Syntactic template selection principle (revised formulation):
The number of syntactic slots for arguments and argument-adjuncts within the core is equal to the number of distinct specified argument positions in the semantic representation of the core.
b. Universal qualification of the principle in (a):
The occurrence of a core as the linked core in a non-subordinate core juncture reduces the number of core slots by 1.
c. Language-specific qualifications of the principle in (a):
1. All cores in the language have a minimum syntactic valence of 1.
2. Passive constructions reduce the number of core slots by 1.
3. The occurrence of a syntactic argument in the pre/postcore slot reduces the number of core slots by 1.

The statement in (b) does not specify which syntactic slot is missing, since that is a construction-specific feature. The linked core in the constructions in (7.18) will always be ‘subjectless’, and this is the central fact about these constructions that the linking system must accommodate.

The discussion of linking in control constructions will begin with the simplest example, (7.18a); its logical structure is given in (7.25b).

(7.25)a. \( \text{do} \ (x_i, \ [\text{try} \ (x_i, [\text{see} \ (y_i, z)])]) \)
b. \( \text{do} \ (\text{Chris}_i, \ [\text{try} \ (\text{Chris}_i, [\text{see} \ (y_i, \text{Pat})])]) \)

The verb *try* takes a non-subordinate core juncture because it is a psych-action verb, in terms of the Interclausal Relations Hierarchy in Figure 6.7; this follows from the meaning of psych-action: the verb codes a mental disposition on the part of its actor to be involved in a state of affairs, and accordingly the actor must also be a semantic argument of the embedded logical structure, because the participant with the mental disposition must also be a participant in the state of affairs denoted by the embedded logical structure. Thus the actor of *try* must control the missing argument in the linked core, i.e. it must also function as a semantic argument in the embedded logical structure. Hence *Chris*, the only argument in the matrix core, is the controller. The crucial syntactic feature of non-subordinate core junctures is that the linked core lacks a syntactic argument position, following (7.24b). The missing argument is the syntactic pivot of the linked core, and in these constructions the pivot is the traditional ‘subject’; therefore it is the prenuclear core argument.
position that is missing in the linked core. Because there is an obligatorily shared semantic argument in the construction, one of the arguments in the embedded logical structure is not filled by lexical material but is coindexed with the controller in the matrix logical structure. The result is the logical structure in (7.25b), and how it links into the syntax is presented in Figure 7.5.

Given the logical structure in (7.25b), the linking algorithm in (7.1) can handle this case without modification. Even though the y argument in the embedded logical structure is not directly linked to an expression in the syntax, it is coindexed with Chris, which is linked to the syntax, thereby satisfying the Completeness Constraint.

There are other coindexing possibilities in the logical structure in (7.25); they are given in (7.26).

(7.26)a. *Chris\textsubscript{i} tried [Pat] to see __\textsubscript{i}.
   \begin{itemize}
   \item a'. \texttt{do'} (Chris\textsubscript{i}, [\texttt{try'} (Chris\textsubscript{i}, [\texttt{see'} (Pat, z\textsubscript{i}) ] )])
   \item b. Chris tried to be seen by Pat.
   \item b'. \texttt{do'} (Chris\textsubscript{i}, [\texttt{try'} (Chris\textsubscript{i}, [\texttt{see'} (Pat, z\textsubscript{i}) ] )])
   \item c. *Chris\textsubscript{i} tried [Pat] to be seen by __\textsubscript{i}.
   \item c'. \texttt{do'} (Chris\textsubscript{i}, [\texttt{try'} (Chris\textsubscript{i}, [\texttt{see'} (y\textsubscript{i}, Pat)] )])
   \end{itemize}

For each of the possible coindexings, there is only one grammatical output. What rules out the impossible linkings? The answer is, the Completeness Constraint. In (a), the actor of \texttt{try} is coindexed with the second argument of \texttt{see}. This means that \textit{Chris} is the actor of \texttt{try} and \textit{Pat} is the actor of \texttt{see}, and when these assignments are mapped into the syntactic structure in Figure 7.5 a problem immediately arises: there is no syntactic position in the second core for an actor to appear in, since the second core has an active voice verb. Hence \textit{Pat} cannot be realized in the syntactic
representation, and this violates the Completeness Constraint. This is given in Figure 7.6.

It is impossible to link an actor to the post-nuclear core argument slot, since actors may only be linked to the generalized privileged syntactic argument (‘subject’) position in an active-voice core in English. Hence no special constraints or principles are needed to explain the impossibility of this potential linking.

The other two sentences involve passive voice in the second core, and here too only one of the two possible linkings is permitted. The sentence in (7.26b) has the same logical structure as in (7.26a), but the second core is passive. This makes possible a linking which does not violate the Completeness Constraint, as Figure 7.7 shows.
The final possible combination is the syntactic representation of Figure 7.7 with the logical structure in (7.25); this combination cannot be successfully linked, as Figure 7.8 shows.

Figure 7.8: Failed linking from semantics \(\rightarrow\) syntax in (7.26c)
The first thing to note here is that the sentence *Chris tried to be seen* is perfectly grammatical, but it is not a possible realization of the logical structure in (7.26c'). Its logical structure is $\text{do}^\prime (\text{Chris}_i, [\text{try}^\prime (\text{Chris}_i, [\text{see}^\prime (\emptyset, z_i)])])$, where the actor of the embedded logical structure is unspecified. The linking in Figure 7.8 violates the Completeness Constraint, because the undergoer *Pat* cannot be realized overtly in this syntactic structure. An undergoer in English can only be realized as a core argument, either in its default post-nuclear position or as privileged syntactic argument in a passive, and neither of these options is available in this structure. The only possible realization for this logical structure is as in Figure 7.5, as noted above.

The four possibilities in (7.25) and (7.26) have been accounted for in terms of the linking algorithm in (7.1) and the Completeness Constraint; no special principles or constraints are required. In particular, it is not necessary to stipulate in the lexical entry for *try* that it must share an argument with its complement logical structure. Thus, there is no need to rule out via stipulation that $\text{do}^\prime (\text{Chris}, [\text{try}^\prime (\text{Chris}, [\text{see}^\prime (\text{Dana}, \text{Pat})])])$ is an impossible logical structure, since there is no possible linking between it and any of the syntactic structures in Figures 7.5-7.8 that could satisfy the Completeness Constraint. Moreover, the same is true with respect to the more complex examples in (7.18b,c); they are handled in exactly the same way. The only complexity they raise is that the theory of control in (7.20) specifies which argument in the matrix logical structure is coindexed with the lexically unfilled argument in the embedded logical structure. No stipulations would be required regarding which argument in the embedded logical structure would be lexically unfilled and coindexed with the argument in the matrix logical structure, because the correct coindexings fall out exactly as in (7.25) and (7.26) (as in Figures 7.5-7.8).

The problem of linking from syntax to semantics in these constructions requires the theory of obligatory control, because the correct interpretation of the sentence depends upon the correct assignment of the controller in the matrix core. Since the issue of the controller is trivial in clauses with M-intransitive matrix verbs, attention will be focused on clauses with M-transitive matrix verbs like *promise* and *persuade* in English and other languages. A Dyirbal sentence involving obligatory control is presented in (7.27), together with its logical structure.

(7.27)a. Balan yabu-$\emptyset$ baŋgul ɲuma-ŋ gu giga-n banaga-ygu.
   NM.ABS mother-ABS NM.ERG father-ERG tell-TNS return-PURP
   ‘Father told mother to return.’

b. $[\text{do}^\prime (x, [\text{say}^\prime (x, y)])] \text{CAUSE} [\text{do}^\prime (z, [\text{return}^\prime (z)])]$
The bulk of the linking is just as for the simple sentences discussed in Chapter 5. Having determined the voice of the verb, the NPs functioning as actor and undergoer can be identified (step 1c2), and after accessing the lexical entries for the verbs in the lexicon and constructing the composite logical structure for the whole sentence, the actor and undergoer assignments for the arguments in it can be determined (step 2). The third step is to match the actor and undergoer of gigal ‘tell’ in the syntax with the actor and undergoer of its logical structure. At this point, all of the relevant steps in (7.2) have been executed, and yet there is, crucially, an unlinked argument, the actor of banagay ‘return’; the Completeness Constraint remains unsatisfied. This is where the theory of obligatory control in (7.20) comes into play: because gigan ‘tell’ is a jussive verb, its undergoer is the controller, and accordingly, the undergoer of gigan is linked to the actor of banagay, yielding the correct interpretation of the sentence and satisfying the Completeness Constraint. The obligatory control linking is represented by the thick, solid black line.

It is clear that it is necessary to add a step to the syntax to semantics linking algorithm to accommodate the crucial role that the theory of obligatory control plays. Accordingly, the following step may be added to (7.2); it follows step 3, and consequently step 4 in (7.2) is now step 5 and step 5 in (7.2) is now step 6. The final version of the linking algorithm will be given in (7.64).

(7.28)4. In non-subordinate core junctures, one of the arguments of the matrix core must be linked to an argument position in the embedded logical structure, following (7.20).

The constructional template for the English obligatory control construction is given in Table 7.4.
**CONSTRUCTION: English obligatory control construction**

**SYNTAX:**
- Juncture: Core
- Nexus: Coordination
- Construction type: Serial verb
  \[
  [\text{CL} [\text{CORE ARG [NUC ...]} (\text{ARG})] \text{CLM} [\text{CORE [NUC ...]} ...] ...]
  \]
- Unit template(s): Core 1: (7.24a,c) Core 2: (7.24a,b,c)
- PSA: Core 1: Controller = semantic controller, following (7.20) Core 2: Pivot = variable syntactic pivot (4.14a,c2)
- Linking: Default

**MORPHOLOGY:** CLM to, from or Ø

**SEMANTICS:** Psych-action, causative/jussive; commissive, directive speech acts

**PRAGMATICS:**
- Illocutionary force: Unspecified
- Focus structure: Unspecified

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<th>Table 7.4: Template for English control constructions in (7.18)</th>
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The template covers all of the constructions with *persuade-* and *promise-*type verbs discussed in this section. The controller is in core 1 and is determined by (7.20). The pivot of the construction is in core 2, not core 1, and it is the highest ranking core macrorole. The linking is specified as ‘default’, as it follows (7.28) without modification.

### 7.3.2 Matrix-coding constructions
Matrix-coding constructions have gone by a number of names in the history of linguistics; the term ‘matrix coding’ is taken from Frajzynger (1995), who proposed it as a theory-neutral label. There are two basic types of matrix-coding constructions: what is called ‘raising to subject’ in the generative literature, as in (7.29a), and the construction in (b) was originally called ‘raising to object’ in transformational grammar but is known in the P&P literature as the ‘exceptional case marking’ construction.

\[(7.29)\]

\[
a. \text{Mary seems to know the answer.}
\]
\[
a'. \text{It seems that Mary knows the answer.}
\]
\[
b. \text{Pat believes Chris to have eaten the bagel.}
\]
\[
b'. \text{Pat believes that Chris ate the bagel.}
\]

Each of these constructions has an alternative form in which there is a finite *that*-clause complement, and in both the core argument which is the ‘subject’ of the finite embedded clause in the alternative construction appears as a core argument in the matrix core, as ‘subject’ in (a) or ‘object’ in (b), hence the names from transformational grammar. The two sentences in each pair have the same logical structure but different semantic representations. This is illustrated for (7.29b,b’) in (7.30), in which the logical structure for both sentences is given in (a) and abbreviated semantic representations for them are given in (b) and (c).

\[(7.30)\]

\[
a. \text{believe}^\prime (\text{Pat, [do'} (\text{Chris, [eat}^\prime (\text{Chris, bagel})) \} & \text{INGR eaten}^\prime (\text{bagel}))
\]
b. \[\langle \text{DEC} \langle \text{TNS}\text{PRES}(\text{believe}^\prime) \rangle \langle \text{ASP}\text{PERF}(\langle \text{do}^\prime (\text{Chris}, [\text{eat}^\prime (\text{Chris}, \text{bagel})) \rangle \& \text{INGR eaten}^\prime (\text{bagel}))) \rangle \rangle \rangle = (7.29b)\]
c. \[\langle \text{DEC} \langle \text{TNS}\text{PRES}(\text{believe}^\prime) \rangle \langle \text{TNS}\text{PAST}(\langle \text{do}^\prime (\text{Chris}, [\text{eat}^\prime (\text{Chris}, \text{bagel})) \rangle \& \text{INGR eaten}^\prime (\text{bagel}))) \rangle \rangle \rangle = (7.29b^\prime)\]

The lack of the obligatory tense operator modifying the embedded logical structure in (b) entails that it will not be realized as a tensed clause, i.e. as a *that*-clause. Hence the semantic representation in (b) is for a core juncture. In (c), on the other hand, there is a tense operator modifying the embedded logical structure, and therefore it will be realized as a tensed clause. There are subtle differences in meaning between the two forms, which have been investigated in e.g. Borkin (1984) and Langacker (1995).

The ‘raising to subject’ or ‘matrix-coding as PSA’ construction is illustrated in (7.31) from Icelandic (Thráinsson 1979) and Kinyarwanda (Bantu; Kimenyi 1980; cf. also the examples from Acehnese in (4.5)).

(7.31) a. *Harold-*ur viríast haf-a for-ið heim. Icelandic
Harold-MsgNOM seem.3sgPRES have-INF go-PSTP home
‘Harold seems to have gone home.’
b. Abá-nyéshuur ba-kwii-ye gu-some ibitabo. Kinyarwanda
2-student 2-essential-ASP INF-read 8-book
‘Students must read the books.’
b’. Bi-rá-kwii-ye ko abá-nyéeshúrí ba-sóm-a ibitabo.
8-PRES-essential-ASP CLM 2-student 2-read-ASP 8-book
‘It is essential that students read the books.’

There is no Icelandic counterpart to (7.29a’) involving the verb viríast ‘seem’ plus a tensed complement. The counterpart to the Kinyarwanda matrix-coding construction is given in (b’). The primary predicates which allow this construction in English are *seem, appear, be likely* and *be certain*, while only viríast ‘seem’ allows it in Icelandic, according to Thráinsson (1979). Kimenyi (1980) describes the verbs that occur in this construction in Kinyarwanda as “modality impersonal verbs”, e.g. -shobok- ‘be possible’, -kwíi- ‘be essential’ and -bujíjw- ‘be forbidden’, and factitive verbs like -babaj- ‘be sad’ and -taangaj- ‘be fascinating’.

The essential feature of the verbs in this construction is that they are either atransitive, like English *seem* and Icelandic viríast, or they are intransitive like English *be likely* and *be certain*. The logical structure for English *seem* and Icelandic viríast is *seem*’ \((x, y) [\text{MR0}]\), where the \(x\) argument is a perceiver which is optionally realized in English by a *to* PP and in Icelandic by a dative NP, as illustrated by the Icelandic example in (7.32) and its English translation.

(7.32) *Harold-*ur viríast mer ver-a besti dreng-ur.
Harold-MsgNOM seem.3sgPRES 1sgDAT be-INF best boy-MsgNOM
‘Harold seems to me to be a nice guy.’

The \(y\) argument is a proposition; hence it is filled by another logical structure. The occurrence of an argument from the embedded logical structure in the core headed by *seem* comes about as follows. There is a direct core argument slot in the matrix core, but the verb has no arguments which can fill it; moreover, since this is a core juncture, the second core is missing the prenuclear core argument position, following (7.24b). The semantic argument that would normally function as
the privileged syntactic argument in the second core cannot be realized in it, due to the absence of its syntactic slot, and this would normally lead to a Completeness Constraint violation, as in e.g. Figure 7.6. However, there is an open core argument position within the clause, namely the one in the matrix core. The argument may be linked to this position, thereby avoiding a Completeness Constraint violation. This linking across a core boundary is permitted by step 5a in (7.1), because it specifies the assignment of [-WH] XPs “to the appropriate positions in the clause.” This step in the linking is clause-bound but nor core-bound; hence this linking is allowed.

The linking from semantics to syntax in (7.29a) is given in Figure 7.10.

Figure 7.10: Linking from semantics → syntax in English matrix-coding construction in (7.29a)

Mary is the actor of know but a core argument in the core headed by seem. The syntactic structure in Figure 7.10 is similar to that in the control constructions with try in Figure 7.5, but differs in terms of nexus. Try-constructions are cosubordinate, due to the shared deontic modality operator across the two cores. Sharing a core operator across the two cores is ruled out in principle in this construction, however, because the matrix predicate does not have an argument that can be modified by a deontic modal operator. Hence the nexus is coordinate. The essential difference between the two constructions lies not in the syntactic structure but rather in how the linking works, which is primarily a function of the semantic properties of the predicate in the matrix core.

The linking from syntax to semantics in this construction requires only a minor modification of the linking algorithm in (7.2) and (7.28). The linking for What does Mary seem to like? is given in Figure 7.11.
As before, the numbers refer to the steps in the linking algorithm in (7.2) as modified in (7.28). Step 1 applies in each core; since the first core is intransitive, the only conclusion that can be drawn is that Mary is a macrorole argument; there is no evidence in the first core as to whether it is actor or undergoer. In the infinitival core the voice is active, and therefore the the privileged syntactic argument NP would be the actor, if there were one in the core. Step 2 is straightforward. In order to execute step 3, the information from step 1 must be used. The core argument Mary cannot be linked to an argument position in the logical structure of seem, because the first argument is unspecified and the second one is filled by a propositional logical structure. There are no core arguments in the second core to be linked to the embedded logical structure like (x, y), and therefore Mary can be linked to an argument position in the embedded logical structure; the question is, which one? As in the control constructions discussed above, the obligatorily missing argument in the linked core is the syntactic pivot, and since step 1 revealed that the privileged syntactic argument of the second core is the actor, Mary must be linked to the actor argument in the semantic representation. Finally, the WH-word in the precore slot is linked to the remaining unlinked argument position, following step 6. The result is the correct linking, with Mary interpreted as the actor of like and what as the undergoer.

The only modification of (7.28) that is required is to specify that in step 4, the theory of obligatory control in (7.20) applies only to control verbs. This may be stated as in (7.33).

(7.33) 4. In non-subordinate core junctures, one of the arguments of the matrix core must be linked to an argument position in the embedded logical structure:
   a. If the matrix predicate is a control verb, this follows (7.20); otherwise,
   b. If the matrix predicate is not a control verb, then link the unlinked syntactic argument in the matrix core to the logical structure argument position of the privileged syntactic argument of the linked core.
An example of a matrix-coding as non-PSA (‘raising to object’) construction from Icelandic (Thráinsson 1979) is given in (7.34).

(7.34) a. Jón-Ø tel-ur í barnaskap sínum John-MsgNOM believe-3sgPRES in foolishness his
sÁ Harold-ur haf-i tel-tó bök-in-a. CLM Harold-MsgNOM have.SBJ-3sgPRES take-PSTP book-DEF-FsgACC
‘John believes in his foolishness that Harold has taken the book.’
b. Jón-Ø tel-ur Harold-Ø í barnaskap sínum John-MsgNOM believe-3sgPRES Harold-MsgACC in foolishness his
haf-a tel-tó bök-in-a.
have-INF take-PSTP book-DEF-FsgACC
‘John believes in his foolishness Harold to have taken the book.’

The (a) sentences involve a finite complement and no matrix coding, whereas the (b) forms show the construction in question. In the Icelandic examples the adverbial phrase í barnaskap sínum ‘in his foolishness’ modifies Jón telur ‘John believes’ and hence is a constituent of the matrix core. The fact that the accusative NP Harald ‘Harold’ occurs between it and telur ‘believes’ shows that Harald is in fact a constituent of the matrix core in (b). It is clear, then, that in the (b) example the accusative NP in the matrix core is a semantic argument of the verb in the linked core.

As in the construction discussed in the previous section, there must be a core argument position in the matrix core which cannot be filled by a semantic argument from the logical structure of the matrix predicate. Since these verbs are obviously not (M)-transitive like seem, the explanation for this open syntactic slot must lie elsewhere. In Foley & Van Valin (1984) it was noted that there is a systematic relationship between the S-transitivity of a verb when it takes NP or clausal syntactic arguments and that when it functions as a complement-taking predicate in a core juncture; namely, its S-transitivity is reduced by one in core junctures. This is illustrated in (7.35).

(7.35) a. Three core arguments → two
Phil told Dana a story [3] → Phil told Dana to ... [2]
Kim promised Sandy a picture of Chris [3] → Kim promised Sandy to... [2]
b. Two core arguments → one
Eileen remembered her purse [2] → Eileen remembered to ... [1]
Beckie wants a new Porsche [2] → Beckie wants to ... [1]

It appears, then, that not only is the S-transitivity of the linked core reduced by 1 but that of the matrix core is as well. It is necessary, therefore, to amend (7.24b) to reflect this. The revised template selection principles are given in (7.36).

(7.36) a. Syntactic template selection principle (revised formulation): The number of syntactic slots for arguments and argument-adjuncts within the core is equal to the number of distinct specified argument positions in the semantic representation of the core.

b. Universal qualification of the principle in (a): The occurrence of a core as either the matrix or linked core in a non-subordinate core juncture reduces the number of core slots by 1.
c. Language-specific qualifications of the principle in (a):
   1. All cores in the language have a minimum syntactic valence of 1.
   2. Passive constructions reduce the number of core slots by 1.
   3. The occurrence of a syntactic argument in the pre/postcore slot reduces the number of core slots by 1.

What happens with believe? If it followed the pattern in (7.35) and (7.36b), then we should have
Juan believed the story [2] → *Juan believed to ... [1] as the only two patterns with this verb. But this is not the case. Rather, with believe we have Juan believed the story [2] → Juan believed Carlos to ... [2]. This is also true for the other verbs which license the construction in (7.29b), e.g. expect, consider, and find. Hence the crucial property of the verbs in this construction is that they are exceptions to the general pattern in (7.35) and therefore to (7.36b) and have one more syntactic argument position in their core than they should.

The actual linking in this construction is the same as that in the other matrix-coding construction, and it is illustrated for the Icelandic example in (7.34b) in Figure 7.12; the adverbial phrase í barnaskap sínum ‘in his foolishness’ is omitted.

![Figure 7.12: Linking from semantics → syntax in the Icelandic construction in (7.34b)](image)

If the linking in the second core had been passive, then the undergoer bók- ‘book’ would have appeared in the open matrix core slot, yielding the Icelandic equivalent of ‘John believes the book to have been taken by Harold’, Jón telur bókina hafa verið tekið af Haraldi.

The syntax to semantics linking algorithm in (7.33) applies to matrix-coding constructions with believe/helja, expect, etc., in exactly the same way as in the ones with seem/hildr discussed in the previous section. This should come as no surprise, since the two constructions are basically the same in terms of linking. The linking from syntax to semantics for Chris was believed by Pat to have eaten the bagel is given in Figure 7.13.
As before, the numbers refer to the steps in (7.33). Each core contains an M-transitive verb, and therefore step 1 applies to both. Because the verb in the first core is passive, and Chris must be a macrorole argument and is not the actor of believe; the actor of believe, Pat, is in the periphery marked by the preposition by. In the second core, the verb is active, and therefore its privileged syntactic argument is an actor and that the bagel is an undergoer. Step 2 is straightforward, and in step 3 it is possible to link Pat with the actor of believe and the bagel with the undergoer of eat. There was no argument position available for Chris in the logical structure of believe, and therefore step 4 comes into play. The actor of eat is the only unlinked argument position in the logical structure, and it is the argument that would be the privileged syntactic argument of eat, were it to occur as the main verb in a simple clause. By step 4 Chris may be linked to the actor of eat, which yields the correct interpretation of the sentence and satisfies the Completeness Constraint. Note that the label ‘non-actor MR’ under Chris in Figure 7.13 means that Chris is not the actor of believe; it does not mean that the NP cannot be interpreted as the actor of a different verb.

The constructional templates for the English matrix-coding constructions are given in Table 7.5.
Table 7.5: Constructional templates for English matrix-coding constructions

There are two templates here, as the crucial feature of the second construction is the violation of (7.36b); the first construction follows it. As in control constructions, the syntactic pivot is in core 2, not core 1, and it is, following the hierarchy for English, the highest ranking core macrorole. The linking is specified as 'default', since it follows (7.33) without modification. These templates would also work for the Icelandic constructions, with the exception that there is no clause linkage marker in the Icelandic matrix-coding constructions.

7.3.3 Core junctures and the domain of case assignment The two types of non-subordinate core junctures we have discussed, control and matrix-coding constructions, interact with the case-marking rules proposed in Chapter 4 in different ways.

There is no real problem with case marking in the matrix core of control constructions. The
basic rules for case assignment in accusative constructions from Chapter 4 are repeated in (7.37).

(7.37) Case assignment rules for accusative constructions:
   a. Assign nominative case to the highest ranking macrorole argument.
   b. Assign accusative case to the other macrorole argument.
   c. Assign dative case to non-macrorole arguments (default).

English, of course, lacks the dative rule in (7.37c). In a sentence like They persuaded us to go to the party, the third-plural actor is the highest ranking macrorole and therefore nominative, and the first-plural undergoer is the other macrorole and therefore accusative. The interesting examples are those involving matrix coding, such as the Icelandic example in (7.34) and its English equivalent, John believes Harold to have taken the book. In Icelandic, Jón ‘John’ is nominative and Harald ‘Harold’ is accusative, and the same pattern hold in English if we replace the proper nouns with pronouns, i.e. he believes him to have taken the book. Jón and he are the actor arguments of telja and believe, but Harald and him are the actor arguments of taka and take. Thus the matrix core contains two actor arguments; how is their case to be decided? The logical structure of these sentences is given in (7.38).

(7.38) believe´ (x, [[do´ (y, Ø)] CAUSE [BECOME have´ (y, z)]])

Jón or he is the x argument, and Harald or him is the y argument. There is a very simple solution to the problem at hand: only Jón and he are arguments of telja or believe, while Harald and him are not, and therefore Jón and he are the highest ranking arguments of telja and believe and receive nominative case, following (7.37a). Harald and him are the other macrorole arguments and therefore receive accusative case. Note that there would have have been a serious problem if (7.37b) had been ‘assign accusative case to the undergoer’, since the accusative NPs in these examples are not undergoers. In sentences like (7.29a) and (7.31a), the only macrorole in the matrix core is a semantic argument of the predicate in the linked core; since it is the only macrorole in the core, it counts as the highest ranking and gets nominative case. Thus, the case assignment rules proposed in Chapter 4 for simple sentences can account for case marking in the matrix cores in these examples.

In §4.5, it was stated that the case marking rules in (4.40) apply to direct syntactic arguments within the core or in the pre/postcore slot, and since only simple sentences were discussed there, this was the only possible domain they could apply in, since they did not apply to NPs in PPs in the periphery. However, in core junctures there is more than one core in a clause, and so the question arises, do the case marking rules apply to each individual core separately, or do they apply to all of the cores jointly within the clause? It turns out that languages vary with respect to the domain of case assignment: in some it is the clause, while in others it is the core.

Icelandic presents the clearest example of a language in which the core is the domain of case marking. The case assignment rules for Icelandic are given in (7.37). That the core is the domain of case assignment in Icelandic can be seen most readily in sentences like (7.39).

(7.39) Jón-Ø tel-ur mér (i barnaskap sínum) haf-a alltaf
       John-MsgNOM believe-3sgPRES 1sgDAT (in foolishness his) have-INF always
    þótt Olaf-ur leðinleg-ur.
    think.PSTP Olaf-MsgNOM boring-MsgNOM

‘John believes me (in his foolishness) to have always considered Olaf boring.’
What is crucial about this example is the occurrence of two nominative NPs, one in each core. If the core is the domain for the application of the case marking rules in (7.37), then the case pattern in (7.39) is accounted for, because Jón is the highest ranking macrorole in the matrix core and Ólafur is the highest ranking macrorole in the second, linked core. If the clause were the domain, then only one nominative NP would be possible, namely the highest ranking macrorole in the matrix core, Jón; all other macrorole arguments would be assigned accusative case, which they are not.

In English, on the other hand, because the clause is the domain of case assignment only the highest ranking macrorole in the matrix core can be nominative; all other macroroles are accusative. This is illustrated in (7.40).

(7.40)  
a. Pat believed her to have told him to ask us to help them.

b. For her to hire them would shock us.

The (b) example is particularly interesting, because it contains no nominative NP at all. This is because the highest ranking macrorole argument, the actor, is realized by an infinitival core, for her to hire them, and cores functioning as arguments do not carry case in English and many other languages. In Huallaga Quechua (Weber 1989), on the other hand, embedded cores and clauses do carry accusative case.

Thus, languages vary with respect to the domain of case assignment: in Icelandic the rules apply independently in each core, while in English, they apply to all of the cores in a clause jointly.

7.4 Linking in complex noun phrases

The primary issue regarding linking in complex NPs concerns relative clauses, in particular, the linking of the head noun to both the matrix clause and to the relative clause, since it functions in both. There are two main types of relative clauses, head-external and head-internal, and each presents a different linking problem: with head-external relatives, the problem is determining the function of the head inside the relative clause, whereas with head-internal relatives, the problem is determining which argument or adjunct in the relative clause also functions in the matrix clause. Within head-external relatives, the two main types are those which have a relative pronoun, such as in English relative clauses with who or which, and those which have no relative pronoun and a gap in the relative clause, as exemplified by English sentences like The man (that) I saw is a spy. Linking in internally-headed relative clauses will not be explicated here; see Van Valin & LaPolla (1997), §9.3. The discussion will begin with the most common type cross-linguistically, externally-headed relative clauses with no relative pronoun.

Both English and Malagasy have this type of relative clause, but Malagasy has an extra twist: there is a restricted neutralization with respect to the head noun of the relative clause (Keenan 1976), while English lacks such a restriction.

(7.41)  
a. Na-hita ny vehivavy (izay) nan-asa ny zaza Rakoto.
   PRFV.ATV-see DET woman CLM PRFV.ATV-wash DET child Rakoto
   ‘Rakoto saw the woman that washed the child.’
   *(‘Rakoto saw the woman that the child washed.’)

a´.Na-hita ny zaza (izay) nan-asa ny vehivavy Rakoto.
   PRFV.ATV-see DET child CLM PRFV.ATV-wash DET woman Rakoto
   ‘Rakoto saw the child that washed the woman.’
‘Rakoto saw the child that the woman washed.’

a’. Na-hita ny zaza (izay) sas-an’ny vehivavy Rakoto.

PRFV.ATV-see DET child (CLM) wash-PASS-DET woman Rakoto

‘Rakoto saw the child that was washed by the woman.’

b. Trevor talked to the woman (that) Colin introduced him to.

b’. Trevor talked to the woman *(that) introduced Colin to him.

In the first two of the Malagasy examples, the head noun, which precedes the relative clause, can only be interpreted as the privileged syntactic argument of the relative clause; since Malagasy is an accusative language and the voice of the verb is active, it is always interpreted as the actor. In the third example it is interpreted as the undergoer, because the voice of the verb in the relative clause is passive. The only restriction that English has on this construction is that if the head noun is the privileged syntactic argument of the relative clause, as in (b’), then the clause-linkage marker that is obligatory; otherwise it is optional.

The logical structure for (7.41a) is given in (7.42a), while the one for (7.41a´´) is given in (7.42b).

(7.42) a. see´(Rakoto, [be´(vehivavy, [do´(x, [wash´(x, zaza)] y)])])

b. see´(Rakoto, [be´(zaza, [do´(vehivavy, [wash´(vehivavy, y)])])])

Following the convention introduced in §2.3, the head noun in the complex nominal logical structure is indicated by the thick dashed underlining. The underlining indicates that vehivavy ‘woman’ will be interpreted as the argument of -hita ‘see’, not the entire logical structure, in (a); the same holds for zaza ‘child’ in (b). Restrictive relative clauses are modifiers like adjectives, and in §2.3 adjectival modifiers were represented in an attributive logical structure, be´(x, [pred’]). Accordingly, the same representation will be used for restrictive relative clauses, with the logical structure of the relative clause filling the ‘pred’ slot in the attributive logical structure. While this is not a control construction, the same mechanism may be used for representing the function of the head noun within the logical structure of the relative clause; the head noun is coindexed with a lexically unfilled variable in the logical structure. In the linking from semantics to syntax, the head of the relative clause must be the privileged syntactic argument of the relative clause in Malagasy, and therefore if the head noun had been coindexed with a variable that would function as a non-actor, then passive or one of the other Malagasy voices would be necessary, as in (7.41a´´). The linking from semantics to syntax in (7.41a) is illustrated in Figure 7.14.
The core template in the relative clause is missing a core argument position, one corresponding to the head noun, and so (7.36) must be revised to handle this. It already refers to syntactic arguments occurring in the precore slot, and this would account for relative clauses with relative pronouns. For other types of externally-headed relative clause, however, there is no element in the precore slot, and therefore technically (7.36c3) does not apply to them. Since it is a universal feature of externally-headed relative clauses that the core is missing an argument position when the head noun is a semantic argument of the verb or predicate in the relative clause, the relative clause provision to (b) should be added, rather than (c) in (7.36). Nothing needs to be said regarding cases in which the head noun is not an argument of the verb in the relative clause, because peripheral constituents are always optional in the syntactic templates. The revised version is given in (7.43).

(7.43)a. Syntactic template selection principle (final formulation):
The number of syntactic slots for arguments and argument-adjuncts within the core is equal to the number of distinct specified argument positions in the semantic representation of the core.

b. Universal qualifications of the principle in (a):
1. The occurrence of a core as either the matrix or linked core in a non-subordinate core juncture reduces the number of core slots by 1.
2. The occurrence of a core in an externally-headed relative clause construction in which the head noun is a semantic argument of the predicate in the core reduces the number of core slots by 1.

c. Language-specific qualifications of the principle in (a):
   1. All cores in the language have a minimum syntactic valence of 1.
   2. Passive constructions reduce the number of core slots by 1.
   3. The occurrence of a syntactic argument in the pre/postcore slot reduces the number of core slots by 1.

The main complication which relative clauses introduce to the linking from syntax to semantics is that when the relative clause is recognized, an attributive logical structure must be introduced into the argument position occupied by the head noun, with the head noun functioning as the first argument of it, and the logical structure of the verb in the relative clause filling the ‘pred’ slot in it. Since there will be an unlinked argument position in the semantics after all of the NPs in the clause are linked, the head must be linked to this position, in order to satisfy the Completeness Constraint. Hence it will be necessary to add a construction-specific condition to the linking specification in the constructional template for relative clauses to deal with these additional complexities; this would be a general condition which all constructional templates for externally-headed relative clauses would have. It can be formulated as in (7.44).

(7.44) Conditions governing linking from syntax → semantics in externally-headed relative clauses
   a. Retrieve from the lexicon an attributive logical structure and substitute the logical structure of the verb in the relative clause for the y argument.
   b. If there is no pre/postcore slot element in the relative clause, then treat the head noun as if it were in the pre/post core slot for linking purposes; if there is an element in the pre/postcore slot in the relative clause, coindex the head noun with it.
   c. Coindex the x argument in the attributive logical structure with the argument in the relative clause logical structure linked to the head noun in (b).
   d. Insert the attributive logical structure into the argument position in the matrix logical structure occupied by the head noun, underlining the head noun.

The steps in (7.44) would come into play as soon as a relative clause is encountered; the steps in (7.33) apply within the relative clause just as within the matrix clause.

The linking from syntax to semantics in (7.41a’) is given in Figure 7.15.
Figure 7.15: Linking from syntax → semantics in Malagasy relative clause in (7.41a´´)

Since Malagasy has a rich voice system, the first step is to determine the voice of the verb in the main clause; since it is active, we may conclude that the privileged syntactic argument is the actor and that the NP immediately following the nucleus is the undergoer. With respect to the relative clause, the voice is passive, which means that the privileged syntactic argument is the undergoer and that the NP immediately following the nucleus is the actor. The head noun, ny zaza ‘the child’, is linked both to the second argument position in the logical structure of the matrix verb – hita ‘see’ and to second argument position in the logical structure of the relative clause; this follows from the fact that Malagasy has a ‘privileged syntactic argument-only’ constraint on the function of the head noun and that, as we just noted, the voice of the verb indicates that the privileged syntactic argument is the undergoer. The two logical structures are related only indirectly through the common linking to the head noun. In the final step the w variable in the matrix logical structure is replaced with the attributive logical structure after the coindexing mandated by (7.44c), yielding the logical structure in (7.42b). The use of step 6 in the linking algorithm to relate the head noun to the empty argument position in the relative clause logical structure is justified by the fact that in languages with this type of relative clause construction, there is a strong structural similarity, sometimes virtual identity,
between WH-question, topicalization/cleft and relative clause constructions. This is illustrated for Malagasy in (7.45).

(7.45)a. Iza no nan-asa ny zaza?
   who PRT ATV-wash DET child
   ‘Who washed the child?’

b. Ny zaza no sas-an’ny vehiavavy.
   DET child PRT wash-PASS-DET woman
   ‘It is the child who was washed by the woman.’

With the exception of the occurrence of the particle *no* in WH-questions and clefts, the structure of the three constructions in Malagasy is virtually the same. The three constructions are subject to the same ‘privileged syntactic argument only’ linking constraint, and accordingly, it is entirely reasonable to use the linking step that handles clefts/topicalizations (which seem to be the same construction in this language) and WH-questions for handling the head nouns of relative clauses.

The constructional template for Malagasy relative clauses is given in Table 7.6.

<table>
<thead>
<tr>
<th>CONSTRUCTION: Malagasy relative clause construction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SYNTAX:</strong></td>
</tr>
<tr>
<td>Juncture: NP</td>
</tr>
<tr>
<td>Nexus: Subordination</td>
</tr>
<tr>
<td>Construction type: Clausal modifier</td>
</tr>
<tr>
<td>Unit template(s): Main clause: (5.2)</td>
</tr>
<tr>
<td>Relative clause template: external head, [–PrCS], (7.43b2)</td>
</tr>
<tr>
<td>PSA: Head noun = variable syntactic pivot of relative clause (4.14a,c1)</td>
</tr>
<tr>
<td>Linking: Semantics → syntax - If actor ≠ syntactic pivot, then marked voice</td>
</tr>
<tr>
<td>Syntax → semantics - (7.44)</td>
</tr>
<tr>
<td><strong>MORPHOLOGY:</strong> CLM izay (optional)</td>
</tr>
<tr>
<td><strong>SEMANTICS:</strong> Restrictive modifier; be´(x₁, [pred´(...y₁...)]), where y is lexically unfilled</td>
</tr>
<tr>
<td><strong>PRAGMATICS:</strong></td>
</tr>
<tr>
<td>Illocutionary force: None (outside of potential focus domain)</td>
</tr>
<tr>
<td>Focus structure: All elements are non-focal</td>
</tr>
</tbody>
</table>

Table 7.6: Constructional template for Malagasy relative clause constructions

The logical structure of relative clauses with relative pronouns differs from those discussed above only in that instead of the logical structure of the verb in the relative clause containing a lexically unfilled variable, the WH-word fills that position and is coindexed with the head. An example of this type of relative clause from English and its logical structure are given in (7.44).

(7.44)a. Pat liked the puppies which Kim saw.
   b. like´(Pat, [be´(puppiesᵢ, [see´(Kim, whichᵢ)])])

The linking from semantics to syntax follows the linking algorithm in (7.1), and the relative pronoun is linked to the precore slot, just as a WH-word is in a WH-question. The linking for (7.44a) is given in Figure 7.16.
The linking from syntax to semantics parallels that for the Malagasy example, with the exception that instead of linking the head noun directly with the logical structure of the relative clause, it is coindexed with the WH-word in the precore slot, which is linked to the logical structure of the relative clause. This is given in Figure 7.17.
The relationship between the two main logical structures is expressed by the coindexing required by (7.44b). In order to integrate the two logical structures, the argument in the attributive logical structure must be coindexed with the argument in the embedded logical structure which is coindexed as required by (7.44b), following (7.44c). The whole attributive logical structure then fills the matrix verb logical structure argument variable which was coindexed with the relative pronoun by (7.44b). The result of the linking, when all of the logical structures are integrated, is (7.44b). Several crucial steps in the linking are supplied by the construction-specific linking requirements in (7.44), which are stated in the constructional templates for English relative clauses given in Table 7.7.
CONSTRUCTION: English relative clause construction (without relative pronoun)

SYNTAX:
- Juncture: NP
- Nexus: Subordination
- Construction type: Clausal modifier
- Unit template(s): Main clause: (5.2)
  - Relative clause template: external head
  - Relative clause: [–PrCS], (5.2), (7.43b2)
- PSA: None
- Linking: Syntax → semantics - (7.44)

MORPHOLOGY: CLM that (required if head noun = PSA of subordinate clause; otherwise optional)

SEMANTICS: Restrictive modifier; be´ (xᵢ, [pred´ (...yᵢ...)]), where y is lexically unfilled

PRAGMATICS:
- Illocutionary force: None (outside of potential focus domain)
- Focus structure: All elements are non-focal

CONSTRUCTION: English relative clause construction (with relative pronoun)

SYNTAX:
- Juncture: NP
- Nexus: Subordination
- Construction type: Clausal modifier
- Unit template(s): Main clause: (5.2)
  - Relative clause template: external head
  - Relative clause: [+PrCS], (5.2), (7.43b2)
- PSA: None
- Linking: Syntax → semantics - (7.44)

MORPHOLOGY: WH-relative pronouns

SEMANTICS: Restrictive modifier; be´ (xᵢ, [pred´ (...yᵢ...)]), where y is relative pronoun

PRAGMATICS:
- Illocutionary force: None (outside of potential focus domain)
- Focus structure: All elements are non-focal

Table 7.7: Constructional templates for English relative clause constructions

There is obviously a great deal of overlap between the two templates, but each type of relative clause has enough distinct features to warrant its own template. Aside from the lack of a pivot for relativization in English, the template for the non-relative pronoun construction is otherwise basically the same as its Malagasy counterpart.

7.5 Reflexivization in complex sentences

In §5.2 a set of principles was presented which govern reflexivization in simple sentences, i.e. constructions with a single nucleus in a single core in a single clause. They are repeated in (7.45).
The reflexive pronoun must not be higher on (4.13) (as applied to selection of privileged syntactic arguments in the language in (4.14c)) than its antecedent. (=(5.14))

b. Logical structure superiority (LS-superiority)
A constituent P in logical structure is LS-superior to a constituent Q iff there is a constituent R in logical structure such that
i. Q is a constituent of R, and
ii. P and R are primary arguments of the same logical structure.

c. Superiority Condition on reflexivization:
A bound variable may not be LS-superior to its binder. (=(5.20))

d. Domain of Obligatory Reflexivization Constraint:
One of two coreferring semantic co-arguments within a simple clause must be realized as a reflexive, while one of two coreferring syntactic arguments (which are not semantic co-arguments) within a simple clause may be realized as a reflexive. (=(5.23))

Complex sentences present challenges to hierarchy and domain conditions. With respect to the first issue, nuclear junctures create composite logical structures; do all of the arguments in the derived logical structures behave like those in the logical structures of simple verbs? Matrix-coding constructions treat semantic arguments from different verbs as syntactic co-arguments; is reflexivization obligatory or optional in this instance? With respect to the domain condition, it is well-known that some languages allow what is known as ‘long-distance reflexivization’, as illustrated in the following Icelandic example (Thráinsson 1991).

(7.46) Jón-Ø sag-i  aëg  hef-i  svik-i sig-i.
John-MsgNOM say-PAST-3sg CLM 1sgNOM have.SBJ-PAST-1sg betray-PSTP SELF
‘John said that I had betrayed myself.’

The ungrammaticality of the English translation indicates that this construction is not found in English.

Core junctures raise a number of important questions. English does not appear to allow reflexivization across a core boundary within a clause containing a core juncture, but other languages do, as the following example from Icelandic (Maling 1986) illustrates; note again the ungrammaticality of the English translation.

(7.47) Harald-ur, skipa-Ø-i mér aë rak-a sig-i.
Harold-MsgNOM order-PAST-3sg 1sgDAT CLM shave-INF SELF
‘Harold ordered me to shave himself.’

In (7.47) the controller and the reflexive are in different cores in the same clause. Control constructions of the type illustrated in (7.48) in English and other languages pose no problems for (7.45), however, since the controller and the reflexive are part of the same logical structure.

(7.48)a. Max persuaded himself to call Dana.

b. Sally persuaded Tom to perjure himself.

The undergoer of persuade is a semantic argument of both verbs, and therefore it is a semantic co-argument of Max in (a) and of himself in (b). Hence both of these sentences meet the condition in
A construction which does present a problem for (7.45d) is reflexivization in the matrix-coding construction, as illustrated in (7.49).

(7.49)  a. Laura\textsubscript{i} believed herself\textsubscript{j/*}\textsubscript{i} to have been elected treasurer.
    b. Miguel\textsubscript{i} believes himself\textsubscript{j/*}\textsubscript{i} to be the heir to the Spanish throne.

Even though *Laura and herself* are arguments of different logical structures, the Role Hierarchy Condition as formulated in (7.45a) applies naturally here, since the actor of the matrix verb is the highest ranking argument in the logical structure. Consequently, *Herself believed Laura to have been elected treasurer* is ruled out; since *herself* in this sentence is the actor of the matrix logical structure and *Laura* is the undergoer in the embedded logical structure, the reflexive is higher on (4.13) than the controller, violating (7.45a). On the other hand, reflexivization is obligatory in this construction, and yet the antecedent and the reflexive are not semantic co-arguments; *Laura and Miguel* are semantic arguments of *believe*, and the reflexive is a semantic argument of the embedded logical structure. Accordingly the problem lies with (7.45d). Replacing ‘semantic co-arguments within a core’ with ‘syntactic co-arguments within a core’, for example, would work fine for the sentences in (7.49) and (7.48a), but it would not work for (7.48b), since *Tom and himself* are in different cores, or for the sentences in (7.50), in which the antecedent and the reflexive are also in different cores.

(7.50)  a. Tanisha\textsubscript{i} seems to have injured herself\textsubscript{j/*}\textsubscript{i}.
    b. Hamid\textsubscript{i} was believed to have recognized himself\textsubscript{j/*}\textsubscript{i} in the picture.

If the restriction were changed to ‘syntactic co-arguments within a clause’, which would cover all of these cases, then there would be no explanation for the ungrammaticality of the English equivalent to (7.47), *Harold ordered me to shave himself*. The primary difference between this sentence and the ones in (7.48b) and (7.50) is that the antecedent and the reflexive are not semantic co-arguments in *Harold ordered me to shave himself*, while they are semantic co-arguments in in (7.48b) and (7.50). This strongly suggests that in English the domain restriction on the reflexivization of semantic co-arguments is different from the domain restriction on the reflexivization of co-referring syntactic arguments which are not semantic co-arguments. Thus, the domain restrictions seem to be as in (7.51).

(7.51) Domain restrictions on obligatory reflexivization in English:
    a. Co-referring semantic co-arguments: can be in different cores within a clause
    b. Co-referring syntactic co-arguments which are not semantic co-arguments: cannot be in different cores within a clause (one may be in PrCS with co-argument in the adjacent core)

This contrast falls out from the linking algorithms for complex sentences, in particular the syntax to semantics linking algorithm in (7.2). Semantic co-arguments are by definition part of the same logical structure in the semantic representation of the sentence, and therefore it is possible to recover their semantic co-argumenthood across core boundaries in non-subordinate core junctures but not across clause boundaries, since clauses link independently of each other. In matrix-coding constructions like (7.49), the controller in the matrix core is linked to an argument position in the same logical structure as the reflexive; hence, even if they are in different cores, the controller and
the reflexive will be linked to argument positions in the same logical structure. In control constructions like (7.48b), in which the controller and the reflexive are in different cores, the theory of control in (7.20) links the controller in the matrix core to an argument position in the same logical structure as the reflexive. This is not the case in *Harold ordered me to shave himself, however; Harold is a semantic argument of order and himself of shave. They are not semantic co-arguments and are not in the same core, and therefore the sentence is ungrammatical. Because the obligatory sharing of a semantic argument in non-subordinate core junctures is the basis of the semantic co-argumenthood across a core boundary, this analysis predicts that reflexivization across core boundaries should not be possible in core subordination, due to the lack of any argument sharing, and this is correct, as (7.52) shows.

(7.52) a. *Danai regretted Bob’s kissing herself,  
b. *Debrai wanted very much for Sam to kiss herself.

It may be predicted, then, that the clause will universally be the syntactic domain for obligatory reflexivization of semantic co-arguments. On the other hand, there is nothing in the linking system that would constrain the interpretation of syntactic (co-)arguments which are not semantic co-arguments, and therefore it may be predicted that languages will vary quite substantially with respect to the treatment of syntactic arguments of this type. This is exactly what is seen in (7.47): in Icelandic co-referring syntactic co-arguments which are not semantic co-arguments can have a domain larger than a core, while in English they cannot. Indeed, Icelandic reflexivization is not even restricted by clause boundaries in some cases, as (7.46) shows.

It is necessary, then, reformulate the Domain of Obligatory Reflexivization Constraint for English in (7.45d) as in (7.53).

(7.53) Obligatory Reflexivization Constraint in English:  
a. For semantic co-arguments, the domain of obligatory reflexivization is the clause: one of two coreferring core arguments which are semantic co-arguments must be realized as a reflexive.  
b. For co-referring syntactic co-arguments that are not semantic co-arguments, the domain of possible reflexivization is the core (and the precore slot):  
(1) if they are both direct arguments, then one of them must be realized as a reflexive;  
(2) if the lower ranking one in terms of (7.45a) is an argument-adjunct, then it may optionally be realized as a reflexive, subject to semantic conditions.

The condition in (a) accounts for the sentences in (7.48) and (7.50); the condition in (b1) accounts for the obligatory reflexives in (7.49), while the one in (b2) accounts for the possibility of reflexivization in (5.13b,c). The semantic condition of affectedness, proposed by Kuno and discussed in §5.2, accounts for the impossibility of the reflexive in (5.17b) and its possibility in (5.13c). Thus, it appears that English does in fact have a type of long-distance reflexivization, namely reflexivization involving semantic co-arguments across a core boundary. It does not, however, have long-distance reflexivization involving syntactic arguments which are not semantic co-arguments, unlike Icelandic and many other languages.

There is a group of matrix-coding examples which raise a rather different problem for the principles in (7.45); they are given in (7.54) along with simplified semantic representations.

(7.54) a. John seems to himself to be sick.  
a’. 〈TNS PRES [seem’ (himselfi, [sick’ (Johni)])]  

There is a group of matrix-coding examples which raise a rather different problem for the principles in (7.45); they are given in (7.54) along with simplified semantic representations.
b. John is certain to appear to himself to be sick.

b'. \( \langle \text{TNS PRE} \{ \text{certain'}(\text{appear'}(\text{himself}, \text{sick'}(\text{John_i}))) \} \rangle \)

c. *It seems to himself that John is sick.

c'. \( \langle \text{TNS PRE} \{ \text{seem'}(\text{himself}, [\text{it}, \langle \text{TNS PRE} \{ \text{sick'}(\text{John_i}) \}])]) \} \rangle \)

The sentences in (7.54a,b) are interesting for two reasons. First, they have been cited as evidence against semantic accounts of reflexivization and in favor of syntactic accounts involving movement and traces, and second, native speakers have quite variable reactions to them, with some finding them fine and others finding them ungrammatical. Is it possible to account for both types of native speaker reactions within the framework of (7.45)?

At first glance it might appear that (7.54a,b) violate the Role Hierarchy Condition in (7.45a), since the reflexive seems to be higher on (4.13) than the controller. This, however, is an illusion. As argued in §5.2, the hierarchy for English is actor > undergoer > other, and in these examples John is an undergoer and himself is a non-macrorole oblique core argument. Consequently, the binding is ‘undergoer binds other’, which follows (7.45a). The problem lies in (7.45c), the Superiority Condition: the reflexive appears to be LS-superior to its controller. This is not necessarily the case, however, and herein lies the crux of the different native speaker reactions. For those who find these sentences ungrammatical, the interpretation of (7.54a,b) with respect to (7.45b,c) is that because (1) himself is an argument of the matrix predicate seem’ and (2) John is the single argument of the embedded predicate sick’, himself is LS-superior to John, and the binding violates the Superiority Condition. There is, however, another way to view the linking in these sentences. Because these are matrix-coding constructions, the embedded predicate seem and its argument John link independently and not as a unit. Hence for linking purposes John is not treated as part of the second argument of seem. This is illustrated in Figure 7.18.

![Figure 7.18: Linking from semantics to syntax in (7.54a)](image_url)

This linking contrasts sharply with that in (7.54c), in which John and seem link as a unit, because the nexus is subordinate. This is illustrated in Figure 7.19.3

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3 See Van Valin & LaPolla (1997), §9.1.1, for discussion of the semantic representation of sentences involving extraposition.
It seems to himself

that John is sick

Figure 7.19: Linking from semantics to syntax in (7.54c)

In this sentence *John is sick* links as a single unit, and therefore the Superiority Condition is unambiguously violated, rendering the sentence ungrammatical. Thus, speakers who find (7.54a,b) grammatical are interpreting the linking in such a way that the Superiority Condition is not violated, while those who reject them are construing it in such a way that the Condition is contravened.

7.6 Constraints on linking in WH-questions and related constructions

In the discussion of linking in WH-questions in Chapter 5, it was noted that the WH-word can be mapped into the syntactic representation in one of four ways: into the precore slot, as in English, into the postcore slot, as in Dhivehi (Cain & Gair 2000), into the normal position for an argument or adjunct, as in Lakhota, or into the core-internal focus position, as in Turkish. There was no discussion of any restrictions on the linking from syntax to semantics, because there seem to be few if any of them in simple sentences. The picture is very different in complex sentences. Consider the following examples involving complex NPs.

(7.55) a. Mulder believes that Scully hid the files.
   a´. What does Mulder believe that Scully hid?

b. Mulder believes the rumor that Scully hid the files.
   b´.* What does Mulder believe the rumor that Scully hid?

c. Scully interviewed the witness who saw the alien spacecraft.
   c´.* What did Scully interview the witness who saw?

It is grammatical in English to form a WH-question with the question word functioning as the undergoer of the embedded clause, when the embedded clause is an object complement, as in (a´). When the embedded clause is a noun phrase complement, as in (b), or a relative clause, as in (c), the result is very different, as (b´) and (c´) clearly show. Ross (1967) argued that NP complements and relative clauses share a common structural feature, namely, the subordinate clause is embedded
within a complex NP with a lexical head noun, and it is this property which blocks question formation. It also blocks the formation of related constructions, namely topicalization and relativization, as illustrated in (7.56).

(7.56)  
a. Those files Mulder believes Scully hid.  
a’. *Those files Mulder believes the rumor that Scully hid.  
a’’. *The alien spacecraft Scully interviewed the witness who saw.  
b. The files which Mulder believes that Scully hid were actually in the trunk of his car.  
b’. *The files which Mulder believes the rumor that Scully hid were actually in the trunk of his car.  
b’’. *The alien spacecraft which Scully interviewed the witness who saw is stored in an abandoned missile silo in North Dakota.

The explanation proposed for these restrictions the general principle of subjacency (Chomsky 1973). This principle has undergone a number of reformulations over the past two decades, but the basic idea is still that movement transformations cannot move an element across particular structural configurations. The idea that subjacency violations like those in (7.55b’, c’) and (7.56a’, a’’, b’, b’’) are caused by a syntactic rule moving an element across more than one bounding node runs into difficulties in languages like Lakhota in which questions words do not appear in the precore slot but rather occur in the normal core-internal position for a corresponding non-WH element, i.e. in situ. This might lead one to expect that there would be no subjacency violations in such a language, but this is incorrect, as the following Lakhota examples show.

(7.57) a. Wičhaša ki [síŋka wa Ο-ŋ-yaxtáke] ki le wa-ŋ-ŋ-yakhe yebo.  
man the dog a cat the 3sgU-3sgA-bite the this 3sgU-3sgA-see DEC  
‘The man saw the dog which bit the cat.’  
b. Wičhaša ki [síŋka wa tákku Ο-ŋ-yaxtáke] ki le wa-ŋ-ŋ-yakhe yebo.  
man the dog a 3sgU-3sgA-bite the this 3sgU-3sgA-see DEC  
‘The man saw the dog which bit something.’  
c. Wičhaša ki [síŋka wa tákku Ο-ŋ-yaxtáke] ki le wa-ŋ-ŋ-yakhe he?  
man the dog a 3sgU-3sgA-bite the this 3sgU-3sgA-see Q  
‘Did the man see the dog which bit something?’  
**‘What did the man see the dog which bit?’

In (b) the undergoer of the relative clause has been replaced by tákku ‘what, something (specific)’, and the result is a sentence with an indefinite-specific undergoer. In (c), the crucial example, the sentence has the question particle he and must be interpreted as a question. In §5.3.3 it was mentioned that simple Lakhota sentences with tákku and the question particle he are ambiguous between WH-question and yes-no question interpretations, as (5.42d) showed; it is repeated below.

(7.58) síŋka ki tákku Ο-ŋ-yaxtáka he?  
dog the 3sgU-3sgA-bite Q  
‘What did the dog bite?, or ‘Did the dog bite something?’

What is striking about (7.57c) is that it is unambiguous, even though it might be expected to be ambiguous just like (7.58). It cannot have the WH-question interpretation, unlike (7.58); it can only have the yes-no question reading. Put another way, tákku cannot be interpreted as a question word in (7.57c); it can only be interpreted as an indefinite-specific pronoun. This is a subjacency
effect, just as in (7.55c') in English; in both examples, it is impossible to form a WH-question if the WH-word functions as (in these cases) a semantic argument in the relative clause.

This is a very important fact. Chomsky’s account of subjacency crucially refers to the movement of WH-words and other elements across certain phrase-structure configurations; the result of this movement is a long-distance dependency between the WH-word and a syntactic ‘gap’ in an embedded clause which spans these configurations. English, which has been analyzed as having syntactic movement rules due to the displacement of the WH-word to the precore slot, shows subjacency effects, as demonstrated in (7.55) and (7.56). Lakhota, which presents no \textit{prima facie} evidence for the existence of displacement in its grammar, also shows subjacency effects, as in (7.57c). Hence languages with ‘movement’ show subjacency effects, and languages without ‘movement’ also show subjacency effects. It may, therefore, be concluded that ‘movement’ (displacement) is \textit{irrelevant} to the explanation of these subjacency effects. It is necessary to look for some other feature common to the grammars of both types of languages for the explanation.

An important clue to what this feature could be comes from the Lakhota sentence in (7.58). In §5.3.3, it was argued that the two interpretations of this sentence result from different construals of what the focus of the question is. That is, if the focus of the question is on \textit{táku}, then it is interpreted as a question word, yielding the meaning ‘What did the dog bite?’ If, on the other hand, the focus is on another constituent, then \textit{táku} must be construed as an indefinite-specific pronoun, resulting in the reading ‘Did the dog bite something?’. If the question word being the focus of the question is the crucial precondition for the WH-question interpretation, then it follows that the reason (7.57c) is not ambiguous is that it is impossible to interpret \textit{táku} as the focus of the question, leaving only the yes-no question reading possible. Why should it be impossible to interpret \textit{táku} as the focus of the question? In §3.3 the notion of the \textit{potential focus domain} was introduced, the part of the sentence in which focal elements can occur; the actual focus domain, where focal elements actually occur in a particular utterance, must be within the potential focus domain. With respect to (7.57c), if \textit{táku} cannot be the focus of the question, then there is no possible utterance in which it is in the actual focus domain, and from this it follows that it must be outside the potential focus domain of the sentence.

The idea that some types of embedded clause are outside the potential focus domain is one encountered originally in §6.6 in the discussion of focus structure in complex sentences. In that section a general principle governing the extent of the potential focus domain in complex sentences was introduced in (6.33), taken from Van Valin (1993b, 1995); it is repeated in (7.59).

\begin{align*}
(7.59) \quad & \text{The potential focus domain in complex sentences:} \\
& \text{A subordinate clause may be within the potential focus domain if it is a direct daughter of} \\
& (\text{a direct daughter of...}) \text{ the clause node which is modified by the illocutionary force} \\
& \text{operator.}
\end{align*}

As discussed in §6.6, there is no limit in principle to the number of direct daughters involved, and accordingly the specification in parenthesis should be considered to be recursive. In terms of cross-linguistic variation, there appear to be only two possibilities: the potential focus domain is restricted to main clauses only, in which case (7.59) is irrelevant to the language, or the potential focus domain can extend to the deepest subordinate clause in any sentence, as long as the condition is not violated.

The application of the principle in (7.59) to the Lakhota examples in (7.57) begins with an analysis of the structure of the sentences; simplified representations of the LSC of each are given in
In (A), the embedded clause is a direct daughter of the clause modified by the illocutionary force operator, and consequently, the embedded clause is within the potential focus domain. In (B) and (C), on the other hand, the embedded clause is not a direct daughter of the clause modified by the illocutionary force operator, and therefore the embedded clauses are outside the potential focus domain. The fact that the relative clause in B is outside the potential focus domain predicts the impossibility of a WH-question reading in (7.57c). The results of the application of (7.57) to the structures in Figure 7.20 is given in (7.60).

(7.60) Summary of potential scope of *he*: Potential focus domain [in boldface]

a. [**Hokšla etg**  thaló ki manú iyúkča] he?
   boys some meat the steal think Q
   ‘Does he think some boys stole the meat?’

b. [**Wičhaša ki šíka wą ignú ki yaxtāke ki le wąyáka**] he?
   man the dog a cat some bite this see Q
   ‘Did the man see the dog which bit some cats?’

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4 This conclusion is independently confirmed in Van Valin & LaPolla (1997), §8.5, by the distribution of the indefinite-non-specific articles and at the possible felicitous responses to yes-no questions in these same complex sentences (cf. (8.64)-(8.68)).
c. [Wičháška wi vóte] ečháh, tha-wíča ki mnú ikíčíča he?
man the eat while his-wife the water get.for Q
‘While the man was eating, did his wife get him water?’

The explanation for the impossibility of the WH-question interpretation of tāku when it is in a definite restrictive relative clause makes a specific prediction about object complements and adverbial clauses: words like tāku should be construable as question words in object complements but not in adverbial clauses. These predictions are correct, as (7.61) shows.

(7.61)a. [Tuwá thaló ki manú] iyúkča he?
      who meat the steal think Q
      ‘Who does he think stole the meat?’, or ‘Does he think someone stole the meat?’

b. [Wičháška ki tāku yúte] ečháh, tha-wíča ki mnú ikíčíča he?
man the eat while his-wife the water get.for Q
‘While the man was eating something, did his wife get him water?’
*‘What did his wife get him water, while the man was eating ___?’

It is clear, then, that in order for tāku, tuwá or one of the other question words/indefinite-specific pronouns in Lakhota to be interpreted as a question word, it must occur in the potential focus domain of the sentence. This may be expressed in a preliminary fashion as the constraint on question formation in (7.62).

(7.62) Constraint on question formation (preliminary formulation):
The element questioned (the question word in a simple, direct WH-question or the focal NP in a simple, direct yes-no question) must function in a clause which is within the potential focus domain of the sentence.

It was shown in §6.6 that the possible interpretation of the focus in a yes-no question is affected by the constraint in (7.59), and therefore the restriction in (7.62) applies to both types of questions. Thus, the principles in (7.59) and (7.62) provide an explanation for the observed subjacency effects in Lakhota.

Can this analysis be applied to languages like English and Icelandic, in which questions words do not occur in situ but rather in the precore slot? In languages of this type, the position of the WH-word in the question is not relevant to explaining the subjacency effects, because in all questions of this kind the WH-word occurs in the precore slot, regardless of the grammaticality of the question. Rather, what is relevant is whether the clause in which the question word functions semantically is in the potential focus domain or not. In applying the principle in (7.59) to English in §6.6, it was found that object complements are in the potential focus domain (cf. Figure 6.18) and that adverbial subordinate clauses are not (cf. Figure 6.19). If the principle in (7.59) is applied to the English relative clauses in Figure 7.16, it is readily apparent that the embedded clause is not a direct daughter of the clause modified by the illocutionary force operator, and therefore relative clauses in English, as in Lakhota, are outside the potential focus domain.6 Finally, given the structure of the noun complement clause in Figure 6.20, the embedded clause is within a NP and

5 This constraint does not apply to echo questions, rhetorical questions or to metalinguistic questions.
6 Non-restrictive relative clauses would also be outside the potential focus domain, since they do not meet the structural condition in (7.59), and in addition, because they are embedded sentences, they have their own illocutionary force operator, which is obligatorily declarative; they are a distinct focus domain from that of the matrix clause. Hence extraction should be impossible out of them, which is the case.
therefore could not be a direct daughter of the clause modified by the illocutionary force operator; accordingly, it too is outside the potential focus domain. We may summarize these results in Table 7.8.

<table>
<thead>
<tr>
<th>Construction</th>
<th>Structure Represented</th>
<th>Direct Daughter?</th>
<th>In Potential Focus Domain?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Object complement</td>
<td>Figures 6.4, 6.18</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Adverbial clause</td>
<td>Figures 6.17, 6.19</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Relative clause (rest.)</td>
<td>Figures 6.21, 7.16</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Noun complement</td>
<td>Figure 6.20</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Table 7.8: Potential focus domain in English complex sentence constructions

With respect to the examples in (7.55), the results in Table 7.8 together with the principle in (7.62) accounts for the grammaticality or ungrammaticality of all of the sentences. Forming a question in which the WH-word functions in an object complement, as in (7.55a′) is grammatical, as predicted, whereas forming a question in which the WH-word functions in a relative clause or noun complement clause, as in (c′) and (b′), respectively, is ungrammatical, again as predicted. It also explains the ungrammaticality of the English translation of the Lakhota example in (7.61b), where the WH-word functions in an adverbial subordinate clause.

An explanation has been provided for the subjacency effects in both English and Lakhota which does not require the existence of a long-distance dependency between a WH-word in the precore slot and a syntactic ‘gap’ in an embedded clause. Rather, what is common to the two languages is the crucial role of the potential focus domain in constraining question formation. This is captured in the principles in (7.59) and (7.62), which apply equally to both languages, despite their manifest syntactic differences. The principle in (7.62) can be integrated naturally into the linking algorithms. In order to block the generation of sentences like (7.55b′), it is necessary to modify step 4 of the semantics to syntax algorithm as in (7.63); the modification is in boldface.

(7.63) Linking algorithm: Semantics → Syntax (Revised)

1. Construct the semantic representation of the sentence, based on the LS of the predicator.
2. Determine the actor and undergoer assignments, following the Actor-Undergoer Hierarchy in Figure 5.1.
3. Determine the morphosyntactic coding of the arguments
   a. Select the PSA, based on the PSA selection hierarchy and principles in (4.13)-(4.14).
   b. Assign the XPs the appropriate case markers and/or adpositions.
   c. Assign the agreement marking to the main or auxiliary verb, as appropriate.
4. Select the syntactic template(s) for the sentence following the principles in (5.2).
5. Assign XPs to positions in the syntactic representation of the sentence.
   a. Assign the [-WH] XPs to the appropriate positions in the clause.
   b. If there is a [+WH] XP in the logical structure of a clause in the potential focus domain,
      1. assign it to the normal position of a non-WH-XP with the same function, or
      2. assign it to the precore or postcode slot, or
      3. assign it to a position within the potential focus domain of the clause (default = the unmarked focus position).
c. A non-WH XP may be assigned to the precore or postcore slot, subject to focus structure restrictions (optional).

d. Assign the XP(s) of LS(s) other than that of the predicator in the nucleus to
  1. the periphery (default), or
  2. the precore or postcore slot, or
  3. the left-detached position.

The addition of the requirement ‘in the logical structure of a clause in the potential focus domain’ makes it impossible to link a WH-word to any position in the syntactic representation if this condition is not met, resulting in a Completeness Constraint violation. In order to constrain the linking from syntax to semantics, it is necessary to modify step 6 in (7.2) as follows.

(7.64) Linking algorithm: Syntax $\rightarrow$ Semantics (Revised formulation)

1. Determine the macrorole(s) and other core argument(s) in the clause.
   a. If the verb is intransitive, then assign the privileged syntactic argument either macrorole or direct core argument status, depending upon the language (language-specific)
   b. If the language lacks voice oppositions, determine the macroroles from case marking and/or word order (language-specific).
   c. If the language has a voice opposition, determine the voice of a transitive verb: (language-specific)
      1. If the construction is syntactically accusative:
         a. If it is the unmarked voice, the privileged syntactic argument is actor.
         b. If it is passive, the privileged syntactic argument is not the actor of the predicate in the nucleus;
            1. The actor may appear as a direct core argument (language-specific); or
            2. The actor may appear in the periphery marked by an adposition or an oblique case (language-specific); or
            3. If there is no actor in the core or the periphery, then replace the variable representing the highest ranking argument in the logical structure with ‘Ø’.
      2. If the construction is syntactically ergative:
         a. If it is the unmarked voice, the privileged syntactic argument is undergoer.
         b. If it is antipassive, the privileged syntactic argument is actor;
            1. The undergoer may appear as a direct core argument or as an oblique element (language-specific).
            2. If there is no undergoer in the core or the periphery, then replace the variable representing the lowest ranking argument in the logical structure with ‘Ø’.
      3. Assign macrorole status to the other direct core argument, if it is not dative or in an oblique case (language-specific).

2. Retrieve from the lexicon the logical structure of the predicate in the nucleus of the clause and with respect to it execute step (2) from (7.1)1, subject to the following proviso:
   a. If the language allows variable undergoer selection and if there is more than one choice for undergoer, do not assign undergoer to an argument in the logical structure.
   b. Determine the linking of the non-macrorole core argument:
      1. If there is a two-place state predicate in the logical structure and if the non-macrorole core argument is marked by a locative adposition or dative or a locative-type case, then link it with the first argument position in the state predicate in the logical structure and link the other non-actor core argument (if there is one) to the second argument position in the state predicate), or
2. If there is a two-place state predicate in the logical structure and if the non-macrorole core argument is not marked by a locative adposition or dative or a locative-type case, then link it with the second argument position in the state predicate and link the other non-actor core argument (if there is one) to the first argument position in the state predicate.

3. Otherwise, link the animate NP with the first argument position in the state predicate.

3. Link the arguments determined in step 1 with the arguments determined in step 2 until all core arguments are linked.

4. In non-subordinate core junctures, one of the arguments of the matrix core must be linked to an argument position in the embedded logical structure:
   a. If the matrix predicate is a control verb, this follows (7.20); otherwise,
   b. If the matrix predicate is not a control verb, then link the unlinked syntactic argument in the matrix core to the logical structure argument position of the pivot of the linked core.

5. If there is a predicative adpositional adjunct, then retrieve its logical structure from the lexicon, insert the logical structure of the core as the second argument in the logical structure and the object of the adposition in the periphery as the first argument.

6. If there is an element in the pre- or postcore slot (language-specific), or a WH-word in situ (language-specific),
   a. assign it the remaining unlinked argument position in the semantic representation of the sentence, provided that the logical structure to which it is linked is for a clause in the potential focus domain.
   b. if there are no unlinked argument positions in the sentence, then treat the WH-word like a predicative preposition and follow the procedure in step 5, linking the WH-word to the first argument position in the logical structure.

1. Treat the entire logical structure of the sentence as the second argument of the predicative preposition (default); or
2. If the embedded clause is within the potential focus domain, then treat only the logical structure of the embedded clause as the second argument of the predicative preposition (optional).

The constraint in step (6a) prevents a WH-word from being linked to the semantic representation unless the condition in (7.62) is met. In a language like English it would leave the WH-word stranded in the precore slot, resulting in a Completeness Constraint violation. In a language like Lakhota, on the other hand, it would block the linking if táku is construed as a question word, likewise resulting in a Completeness Constraint violation. But there is another option in Lakhota; táku can also be interpreted as an indefinite-specific pronoun, and on this interpretation the condition in (7.62) does not apply, thereby allowing the linking of táku to a variable in the logical structure, satisfying the Completeness Constraint, and yielding the yes-no question reading.

The reformulation of step (6b) makes it possible to capture well-known constraints on the interpretation of adjunct WH-questions, as exemplified in (7.65).

(7.65) a. When did Skinner say that Krycek would be at the missile silo?
   b. When did Scully interview the witness who saw the alien spacecraft in the silo?
The sentence in (a) is ambiguous; it can be a question about when something was said or about when someone would be somewhere. The sentence in (b), however, is not ambiguous; it can only be a question about when the interview took place, not about when someone saw something. The issue here is again what can be questioned, more specifically, what can be questioned with respect to the time of its occurrence. It would be expected, then, that the potential focus domain would play a key role in constraining the interpretation of the question, and this seems to be the case. (7.65a) involves a structure which is compatible with the embedded clause being in the potential focus domain, and accordingly it is ambiguous with respect to the interpretation of the scope of when. The structure in (b), however, does not meet the condition in (7.59) (cf. Table 7.8), and therefore the embedded clause is not in the potential focus domain; hence it cannot be the focus of the question, and when must be interpreted as modifying the matrix clause.

The discussion thusfar has concentrated on WH-question formation, but as shown in (7.56), topicalization and restrictive relativization are also subject to the same constraints. In many languages these constructions are syntactically very similar, but functionally they are not so similar in terms of the discourse function of the WH-word in a question, the non-WH NP in the precore slot in a topicalization construction, and the head of a relative clause. This is summarized in Table 7.9.

<table>
<thead>
<tr>
<th>Construction</th>
<th>Function of ‘extracted’ element</th>
</tr>
</thead>
<tbody>
<tr>
<td>WH-question</td>
<td>Focus</td>
</tr>
<tr>
<td>Topicalization</td>
<td>Focus or Topic</td>
</tr>
<tr>
<td>Relativization</td>
<td>Topic</td>
</tr>
</tbody>
</table>

Table 7.9: Discourse functions of ‘extracted’ element in ‘extraction’ constructions

There is an obvious connection between WH-elements, which are always focal, and focal non-WH elements in the precore slot, on the one hand, and the potential focus domain, on the other, and this is the basis for the provisions in the linking algorithms introduced in (7.63) and (7.64). Why should topicalization and restrictive relativization also be constrained by the potential focal domain, given that the NP in the precore slot in a topicalization construction can be topical and that the head noun is always topical with respect to the relative clause? The essential feature that these two constructions share is that the clause in which the displaced NP functions is always about the referent of the NP (Kuno 1987). The central notion, then, is pragmatic aboutness; the restrictive relative clause must be interpretable as being about its head, and the sentence fragment following a topical element in the precore slot must likewise be interpretable as being about the precore slot element. This condition may be formulated as in (7.66); Kuno (1987) presents a similar constraint.

(7.66) Pragmatic-aboutness condition on topicalization and relativization:
The sentence fragment following a topical element in the precore slot or a restrictive relative clause must be pragmatically interpretable as being about the precore slot element or the head noun.

Reinhart (1981) presents an analysis of pragmatic aboutness. She argues that in order for a sentence to be about the referent of an NP, it must be possible to form an alternative sentence (with the same essential structure) in such a way that the NP at issue functions as the focus of a possible assertion that the sentence can be used to make. To illustrate what she means here, look again at
Those files Mulder believes Scully hid. Reinhart’s analysis requires that, in order for the sentence fragment Mulder believes Scully hid to be construable as pragmatically about the precore slot NP those files, there must be an alternative form of this sentence in which the NP those files serves as the focus of an assertion. The sentence in (7.55a), Mulder believes that Scully hid those files, is such a sentence; how can it be shown that those files can serve as the focus of (7.55a)? As discussed in §6.6, only the asserted part of an utterance can be interpreted as being negated, and accordingly, if the constituent can be negated or denied in a conversational exchange, then it is a possible focus. This is illustrated in (7.67).

(7.67) Speaker 1: Mulder believes that Scully hid those files.
Speaker 2: No, the keys to his car.

The fact that this is a felicitous exchange shows that those files can be negated and therefore is a possible focus in (7.55a). This meets Reinhart’s criterion for pragmatic aboutness, and consequently it may be concluded that the sentence fragment Mulder believes Scully hid is interpretable as being about the NP those files in (7.56a). Hence the construction in (7.56a) meets the condition in (7.66) and is predicted to be grammatical, which it is. Her criterion makes crucial reference to the constituent serving as the focus of a possible assertion that the sentence can be used to make, and here is where the potential focus domain comes in: in order for a constituent to be the focus of a possible assertion that a sentence can be used to make, it must be in potential focus domain.

Now compare (7.56a) with (7.56a´), *The alien spacecraft Scully interviewed the witness who saw. In order to determine whether the sentence fragment Scully interviewed the witness who saw can be interpreted pragmatically as being about the NP the alien spacecraft, it is necessary to take an alternative form of the sentence and ascertain if the alien spacecraft is a possible focus in it. The alternative sentence is (7.55c), Scully interviewed the witness who saw the alien spacecraft; it is necessary to place it in the same type of context as in (7.67) to see if this NP can be negated.

(7.68) a. Speaker 1: Scully interviewed the witness who saw the alien spacecraft.
Speaker 2: *No, some lights in the sky.

b. Speaker 1: Scully interviewed the witness who saw the alien spacecraft.
Speaker 2: No, Skinner.(= ‘Scully interviewed the witness’, = ‘Scully interviewed Skinner’, but not = ‘the witness who saw Skinner’) 

The results are very different from (7.67). In both interchanges it is impossible to deny the alien spacecraft, and this means that it cannot be interpreted as the focus of a possible assertion that (7.55c) can be used to make. If that is the case, then the sentence fragment Scully interviewed the witness who saw cannot be interpreted pragmatically as being about the alien spacecraft, and therefore the condition in (7.66) is not met, and the topicalization construction in (7.56a´) is predicted to be ungrammatical, which it is.

In order for a constituent to be negatable (deniable) as in (7.67), i.e. without repeating the whole previous utterance, it must be interpretable as the focus of the question, and this requires it to be in the potential focus domain. Restrictive relativization and the occurrence of topical elements in the precore slot are constrained by the condition in (7.66), which crucially builds on Reinhart’s analysis of pragmatic aboutness. In her analysis, in order for a sentence fragment or relative clause to be about the referent of an NP, it must be possible to form an alternative sentence (with the same essential structure) in such a way that the constituent at issue functions as the focus of a possible assertion that the sentence can be used to make. This requires the constituent to be in the potential
focus domain. Thus, even if the displaced NP is a topic, the interpretation of the construction is still constrained by the potential focus domain. If it is focal, then the interaction with the potential focus domain is the same as for WH-questions. Thus, all of the constructions in Table 7.9 are constrained by the potential focus domain, and therefore the provisions in the linking algorithms regarding the potential focus domain will work for them, too.

There is still one puzzle remaining regarding relative clauses. While it makes sense to talk about the sentence asserting something about the topic NP in the precore slot in a construction like (7.56a), for example, it is not possible to say the same thing about (7.56b), in which the files is the head noun and which Mulder believes Scully hid is the relative clause. Restrictive relative clauses do not assert anything; as restrictive modifiers, they are presupposed. Why, then, should the potential focus domain restrict the interpretation of constructions which are by definition not asserted? A plausible answer lies in the connection between assertion and predication. Cattell (1984) and Kluender (1992) argue that constraints being investigated are derived from restrictions on the formation of complex predication structures, and it has long been recognized that the subject-predicate opposition is fundamentally one of topic and comment, with the predicate being an assertion about the topic (cf. the discussion of predicate focus in §3.2). If this is the case, then limits on what can be construed as an assertion about a topic are also limits on what can be construed as a possible predication about a ‘subject’. Restrictive relative clauses are complex predications modifying an NP; note that the logical structure of a head noun + relative clause is the same as that of an attributive construction. Thus the predication relationship between The boy and is tall in The boy is tall is analogous to that between the files and which Mulder believes that Scully hid in (7.56b). It is uncontroversial that the predicate is tall asserts something about the boy in The boy is tall, and there it is clear that predication and ‘assertion about’ are fundamentally related notions. If this is the case, then the application of constraints on ‘assertion about’ to predication follows naturally. Hence, the head noun must be related to the relative clause in such a way that if the relative clause were an independent sentence and the head noun a topic, the relative clause could be construed as an assertion about that topic. And the precondition for this is that the NP serving as the head noun must function within the relative clause in such a way that if the relative clause were an independent assertion containing the NP, the NP would be in the potential focus domain. Thus, despite the different functions of the displaced elements in these three constructions, they are all ultimately constrained by the whether the embedded clause in question can be in potential focus domain, and this follows from (7.59).

The constraint in (7.59) represents the default distribution of the potential focus domain in complex sentences. There are a number of other factors which interact with it to reduce or extend the potential focus domain. In particular, lexical semantic factors may also influence the potential focus domain, both in terms of preventing a position in the potential focus domain from being the actual focus domain and of overriding the principle in (7.59) and permitting the actual focus domain to be in structural configurations where it would otherwise be impossible. These two possibilities can be illustrated in English. The principle in (7.59) predicts that WH-question formation, etc. should be possible out of object complements, but this is not always true. It has long been noted that while it is very easy to form a question out of the complement of say, it is highly odd to do this out of the complements of verbs of manner of speaking, e.g. ??What did Fred murmur/choirte/lisp that Mary had bought?. There is a straightforward Gricean explanation for this (Grice 1975). The focus of an utterance is the most informationally rich part, and the selection of say, the most semantically neutral verb of saying, together with an unmarked intonation pattern, indicates that the primary information content of the utterance is the substance of the communication, which is syntactically expressed in the complement clause. Hence the focus can fall in the that-clause,
making question formation, etc. possible. The choice of a verb which highlights the way in which something is said rather than what is said, such as *murmur, chortle and lisp*, causes the focus to shift to the verb in the main clause, because of the maxim of relevance: the speaker’s choice of an informationally richer expression (*murmur*) over another, more neutral possibility (*say*) only makes sense in terms of the Cooperative Principle if the manner of expression is in fact highly relevant to the main point of the utterance. Hence the focus must fall on the matrix verb, keeping the complement from being the actual focus domain despite the fact that the structure as a whole meets the condition in (7.59). The same thing occurs in ‘extraction’ out of NPs: when the main verb is not informationally distinctive, as in *Who did you read a book about_* ?*, forming a question out of the PP in the undergoer NP is fine; when, however, when the verb is informationally rich, it naturally draws the focus for the same Gricean reason as above, precluding the possibility of the object NP being the actual focus domain, e.g. *Who did you deface/lose/destroy a book about ___?*. The second type of lexical semantic effect is exemplified with complex NPs like *make the claim* or *hold the belief*. The structure of a sentence like *Fred made the claim that Mary stole the money* does not meet the condition in (7.59), because the subordinate clause is part of an NP and is not a direct daughter of the matrix clause node; hence it should be outside the potential focus domain and question formation out of it should be impossible. However, it has long been known that question formation is in fact possible for at least some speakers, e.g. *What did Fred make the claim that Mary stole?*, and it has usually been argued that this question is acceptable because *make the claim that X* is virtually synonymous with *claim that X*, an expression whose structure meets principle in (7.59). When there is no simple object complement paraphrase, as in e.g. *What did Fred investigate the claim that Mary stole?*, then the question is ungrammatical as predicted. Here lexical semantic factors have overridden the principle in (7.59) to permit an otherwise excluded structure to fall within the actual focus domain.

Finally, discourse considerations may also affect the interpretation of the focus domains, as Kuno (1987) has argued. For example, the odd extraction-from-NP question above can be made rather more acceptable if it is part of an exchange like the one in (7.69), from Kuno (1987).

(7.69) A: ‘Right after Chairman Mao died, they started taking pictures of Committee members off the walls.’
   B: ‘Who did they destroy more pictures of, Chairman Mao or Jiang Qing?’

It has also been long known that these constructions are strongly affected by the definiteness of the head noun, as the examples in (7.70) show.

(7.70) a. Who did you read a book about?
   b. *Who did you read the book about?*
   c. *Who did you read the green book about?*
   d. *Who did you read Pat’s book about?

The only difference among these four sentences is the definiteness and the restrictive modification of the head noun; the basic syntactic structure of the four is the same. Hence whatever rules out (b)-(d) cannot be syntactic in nature. The NP headed by *book* is increasingly presupposed in (b)-(d), with concomitantly increasing difficulty of extracting out of it. Relative clauses in some languages can be affected by the definiteness and semantic content of the head noun. In Danish, for example, it is possible to form a question out of a relative clause if the main clause is relatively empty semantically and the head noun is non-specific or generic, according to Erteschik-Shir
(1973) and Erteschik-Shir & Lappin (1979); they show that the Danish equivalent of *what are there many who like?* is perfectly acceptable. Jensen (2000) shows that even apparently definite restrictive relatives can permit extraction, as exemplified in (7.71).

(7.71) Det kender jeg den mand som har købt ___.

that know 1sg the man REL has bought
‘That I know the man who bought.’

Such a construction is acceptable only if it immediately follows an utterance introducing the referent of *det* ‘that’, as in (7.72).

(7.72) Speaker 1: Jeg tror det faldeførige funkishus er blevet solgt.

1sg think the tumble-down cubist house is been sold
‘I think the tumble-down cubist house has been sold.’

Speaker 2: Det kender jeg den mand som har købt ___.

‘That [= cubist house] I know the man who bought.’

Outside of this context (7.71) is unacceptable; hence language-specific contextual constraints serve to override the basic principle in (7.59). These facts show that restrictions on WH-question formation and related constructions cannot be treated as a purely structural phenomenon but rather must be seen as involving the interaction of syntactic structure, pragmatic functions, and lexical semantics. Indeed, the fact that the same syntactic configuration may permit WH-question formation in one context or with one main verb but not allow it in a different context or with a different main verb is strong evidence that the restrictions are not purely syntactic in nature.

It seems to be the case that (7.59) is not operative in the grammar of some languages at all. Japanese appears to be such a language. Kuno (1973) and other have claimed that subjacency restrictions are not found in Japanese, because it is possible to form WH-questions, relative clauses and topicalizations out of the structures in Table 7.8. This is an oversimplification, however. As Hasegawa (1989) and Shimojo (2002) have showed, not all WH-questions, relative clauses and topicalizations out of the structures in Table 7.8 are grammatical, and the factors that condition the acceptability of these constructions are primarily pragmatic and lexical semantic, but in Japanese they seem to impose restrictions on interpretations, rather than overriding (7.59) as in English and other languages.

An important example of a structure which meets the condition in (7.59) but which is nevertheless incompatible with question formation, etc. is illustrated in (7.73).

(7.73) a. Scully said (that) Mulder interviewed the suspect.

b. Who did Scully say interviewed the suspect?

c. *Who did Scully say that interviewed the suspect?*

d. Who did Scully say (that) Mulder interviewed?

The basic sentence, given in (a), meets the condition in (7.59), and as expected WH-question formation is possible out of it, as in (b) and (d). The embedded clause is in the potential focus domain. What is surprising is the ungrammaticality of (c); the only difference between (b) and (c) is the presence of the complementizer *that* in (c). The presence or absence of *that* has no effect on questions in which the WH-word is related to a post-verbal position; it is relevant only when the WH-word is interpreted as the ‘subject’ of the clause. This phenomenon is not universal, by any means. In Lakhota, for example, the presence or absence of an overt complementizer has no effect
on WH-question formation in object complements (Williamson 1984, Van Valin 1993b)

The nature of this constraint concerns the distribution of narrow focus in clauses. A WH-word is narrow focus, and in a language in which WH-words occur in situ, the position in the clause where the WH-word occurs must be a possible position for narrow focus. In a language like English in which the WH-word occurs in the precore slot, the corresponding requirement is that the position the WH-word is interpreted as filling in the clause must be a possible position for narrow focus. In §3.2 the distinction between marked and unmarked narrow focus was introduced, with narrow focus on the final core XP being the least marked and narrow focus on the ‘subject’ being the most marked. There is another parameter of markedness as well, namely main vs. subordinate clause. All languages allow narrow focus in main clauses but some prohibit it in tensed embedded clauses, e.g. Polish (Eschenberg 1999). Hence main clauses are the unmarked location for narrow focus, embedded clauses the marked location. These two markedness parameters interact, as Table 7.10 shows.

<table>
<thead>
<tr>
<th>Location of actual focus domain</th>
<th>Position of narrow focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘Object’ in main cl.</td>
<td>–</td>
</tr>
<tr>
<td>‘Subject’ in main cl.</td>
<td>+</td>
</tr>
<tr>
<td>‘Object’ in emb. cl.</td>
<td>–</td>
</tr>
<tr>
<td>‘Subject’ in emb. cl.</td>
<td>+</td>
</tr>
</tbody>
</table>

Table 7.10: Markedness of narrow focus

Thus, in terms of these two markedness parameters, the least marked type of narrow focus is narrow focus on the ‘object’ (i.e. final XP in the core) in the main clause, while the maximally marked type is narrow focus on the ‘subject’ in an embedded clause.

In (7.67) it was shown that the ‘object’ position in a that-clause is a possible focus position; what about core-initial position? The same test as in (7.67) can be used to find out.

(7.74) a. Speaker 1: Scully said Mulder talked to the detective.

    Speaker 2: No, Skinner. (= ‘Skinner said...’, = ‘Scully said Skinner talked...’, = ‘Mulder talked to Skinner’)

b. Speaker 1: Scully said that Mulder talked to the detective.

    Speaker 2: No, Skinner. (= ‘Skinner said...’, = ‘Mulder talked to Skinner’, but ?? = ‘Scully said that Skinner talked...’)

In (a), it seems relatively easy to interpret Skinner as replacing any of the three NPs in speaker 1’s utterance. In (b), on the other hand, while it is easy to construe Skinner as replacing Scully or the detective in speaker 1’s utterance, it is more difficult than in (a) to interpret it as replacing Mulder. This means that it is more difficult to interpret Mulder as the focus of speaker 1’s utterance in (b) than in (a), and this correlates with the presence or absence of that. It is easiest to interpret Mulder as the focus in (b) if that is destressed and Mulder is stressed. This seems to parallel the fact that many native speakers find (7.73c) more acceptable if that is destressed and pronounced.
It appears, then, that the occurrence of an overt complementizer blocks marked narrow focus on the preverbal privileged syntactic argument position, and if narrow focus is not possible in a position in a clause, then it is not possible to form a WH-question with the WH-word interpreted as having the function associated with that position. This is not an issue of the potential focus domain; that the embedded clause is in the potential focus domain is shown by the grammaticality of the WH-questions in (7.73d). Thus it appears that while unmarked narrow focus is possible in the embedded clause in (7.73d) when a complementizer is present, marked narrow focus on the ‘subject’ is not. Note that when the complementizer is absent, the ‘subject’ of the embedded clause occur in effect in a position equivalent to the final position in the matrix core, a position which is the most unmarked focus position, and in this case marked narrow focus on the ‘subject’ of the embedded clause is indeed possible, as the grammaticality of (b) shows. This is in effect a kind of erasing of the boundary between the main and embedded clause focus structures. This account predicts that if the main clause contains a peripheral adjunct, the acceptability of an embedded ‘subject’ question will be degraded, because the embedded ‘subject’ will clearly not be in the main clause unmarked focus position, and this seems to be the case, as (7.75) shows.

(7.75) a. Who did Kim say talked to Dana?
   b.*Who did Kim say yesterday talked to Dana?

Thus, the sharper the distinction between main and embedded clause, the more difficult it is to get narrow focus on the embedded clause ‘subject’.

If one were to try to form a topic construction with (7.73d), the result is predictably ungrammatical, *Mulder Scully said that interviewed the suspect. Because this sentence does not pass the negation test in (7.74b), it fails to meet Reinhart’s pragmatic aboutness criterion and therefore fails to meet the condition on topic constructions in (7.66). The issues raised above in the discussion of pragmatic aboutness this apply to (7.73c) as well, and the failure to meet Reinhart’s criterion has the same consequences. Thus, the occurrence of an overt complementizer renders the ‘subject’ of the embedded clause pragmatically and syntactically inert with respect to ‘extraction’ constructions.

It has been shown in this section that the much discussed and theoretically very important restrictions on WH-question formation and related constructions are the result primarily of the complex interaction of syntactic structure and focus structure; they are neither purely syntactic, nor are they purely pragmatic. As is well known, languages vary with respect to the restrictions placed on question formation, and the approach presented here makes it possible to identify the parameters along which languages will vary. There are two major ones: (1) how ‘deep’ into the sentence does (7.59) apply?, and (2) how much can lexical semantic and other factors override (7.59)? As mentioned in Chapter 6, some languages restrict the potential focus domain to matrix clauses only, and accordingly no extraction out of any kind of embedded clauses is possible. Moreover, lexical semantic and pragmatic factors can interact with (7.59) to lead to variation in acceptability of question formation, etc. within a single language and across languages.