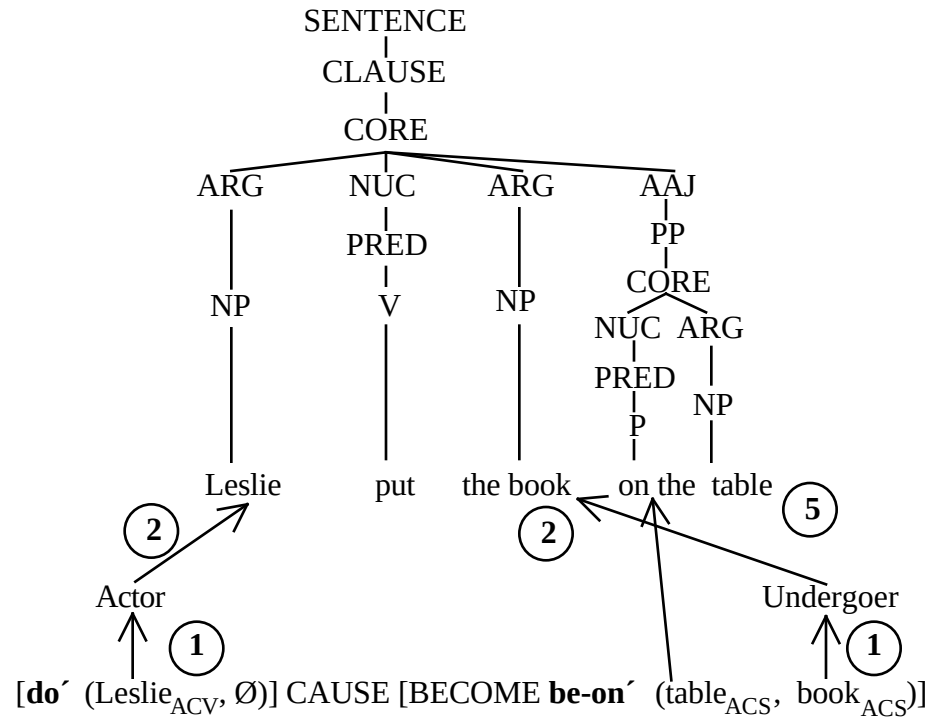
Chapter 7 Exercises Solutions

1. Diagram the linking between the semantic representation and the syntactic representation for each of the following sentences. Start from the semantic representation and summarize each step of the process explicitly, following the linking algorithm in (7.12). For the syntactic structures, use only the constituent projection of the sentences; ignore the operator projection.

(1) Leslie put the book on the table.

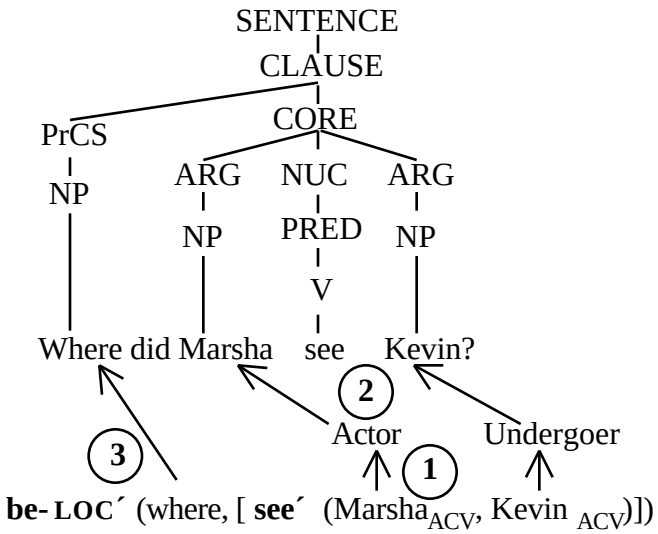
The first step is the selection of the logical structure of the verb from the lexicon and the selection of the lexical items that will fill the argument positions in the logical structure, based in part on the discourse status of their referents. In addition, it is necessary to select the appropriate syntactic template, following the principles in (7.7). Having constituted the semantic representation (minus operators) and selected the appropriate syntactic representation, the linking algorithm in (7.12) now comes into play. Step 1 involves actor and undergoer assignment; the first argument of **do´**, *Leslie*, is selected as actor and the second argument of **be-on´**, *book*, is selected as undegoer. In step 2, since this is an active voice linking, the actor is selected as PSA and assigned to the prenuclear PSA position, while the undergoer is assigned to the immediately postnuclear position. The remaining argument, *table*, is linked to the NP slot in the argument-adjunct PP; *on* is assigned in step 5, and the agreement of the finite verb is also determined.



(2) Where did Marsha see Kevin?

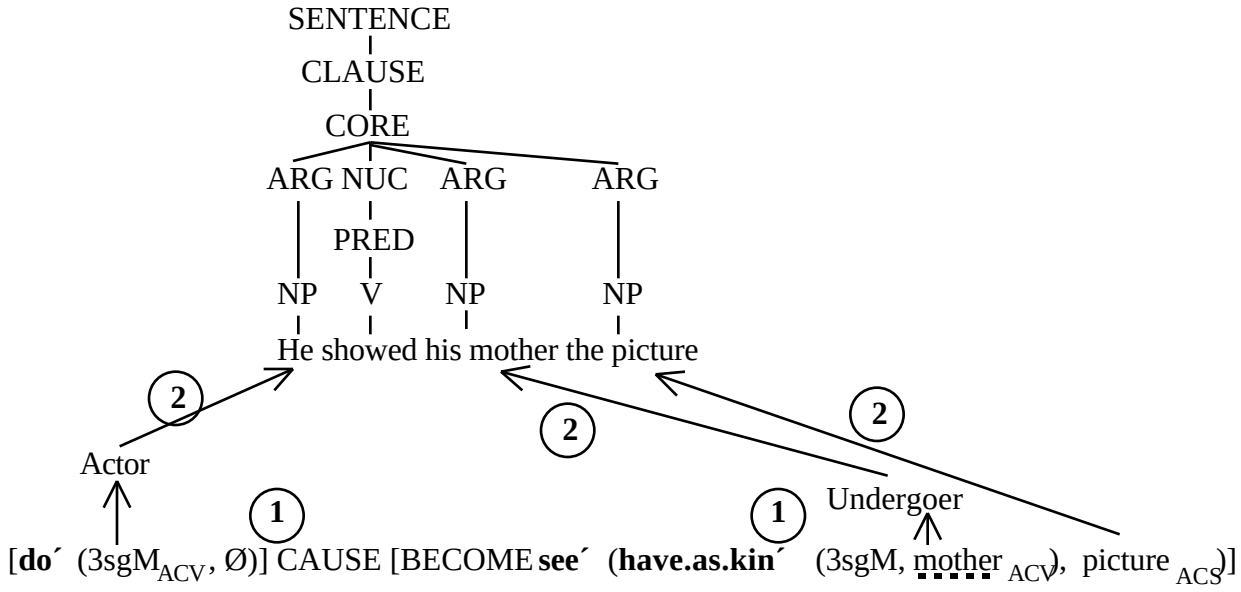
The first step is the selection of the logical structure of the verb from the lexicon and the selection of the lexical items that will fill the argument positions in the logical structure, based in

part on the discourse status of their referents. In addition, it is necessary to select the appropriate syntactic template, following the principles in (7.7). Having constituted the semantic representation (minus operators) and selected the appropriate syntactic representation, the linking algorithm in (7.12) now comes into play. In step 1, the first argument of **see´**, *Marsha*, is selected as actor and the second argument, *Kevin*, as undergoer. In step 2, since this is an active voice linking, the actor is selected as PSA and appears in the appropriate position; the undergoer appears in the immediately postnuclear position. There is a WH-word in the semantic representation, and by step 3 it is linked to the PrCS. In step 5 the case rules don't apply, since the NPs are non-pronominal, but the agreement of the finite verb is determined.



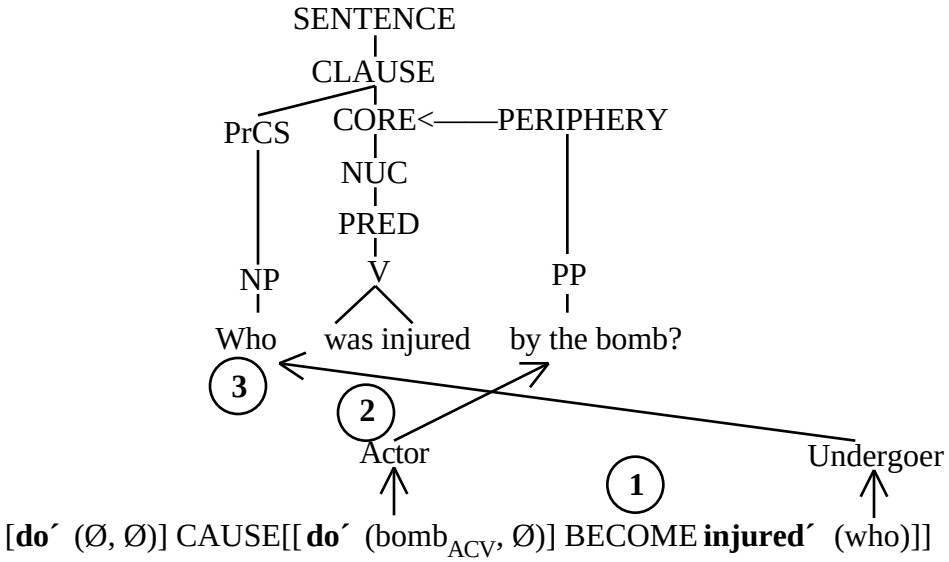
(3) He showed his mother the picture.

The first step is the selection of the logical structure of the verb from the lexicon and the selection of the lexical items that will fill the argument positions in the logical structure, based in part on the discourse status of their referents. In addition, it is necessary to select the appropriate syntactic template, following the principles in (7.7). Having constituted the semantic representation (minus operators) and selected the appropriate syntactic representation, the linking algorithm in (7.12) now comes into play. In step 1, the first argument of **do´**, *he*, is selected as actor and the first argument of **see´**, *his mother*, as undergoer; this is a marked linking to undergoer, as the default choice would be the second argument of **see´**, *the picture.* In step 2, since this is an active voice linking, the actor is selected as PSA and appears in the appropriate position; the undergoer appears in the immediately postnuclear position,and the non-macrorole argument is linked. Since *show* is one of the 'dative shift' verbs, the normal rule assigning *with* in step 5 is blocked, and *the picture* appears as a direct core argument.



(4) Who was injured by the bomb?

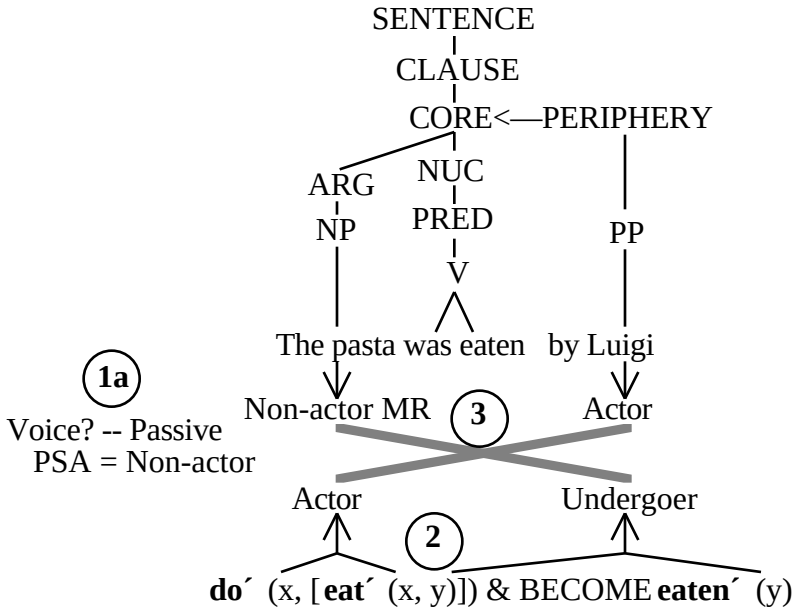
The first step is the selection of the logical structure of the verb from the lexicon and the selection of the lexical items that will fill the argument positions in the logical structure, based in part on the discourse status of their referents. In addition, it is necessary to select the appropriate syntactic template, following the principles in (7.7). Having constituted the semantic representation (minus operators) and selected the appropriate syntactic representation, the linking algorithm in (7.12) now comes into play. In step 1, the first argument of the second **do´**, *the bomb*, is selected as actor, because the first **do´** has all unspecified arguments. The single argument of **injured´**, *who*, is selected as undergoer. In step 2, since this is an passive voice linking, the actor appears as an adjunct in the periphery; because the undergoer is [+WH], it cannot be linked by step 2. The WH-word in the semantic representation is linked to the PrCS by step 3. There are no other core elements to be linked, and the application of the case assignment rules in step 5 yields *who* for the WH-word.



2. Diagram the linking between the syntactic representation and the semantic representation of each of the following sentences. Start from the syntactic structure and summarize each step of the process explicitly, following the linking algorithm in (7.36). For the syntactic structures, use only the constituent projection of the sentences; ignore the operator projection.

(1) The pasta was eaten by Luigi.

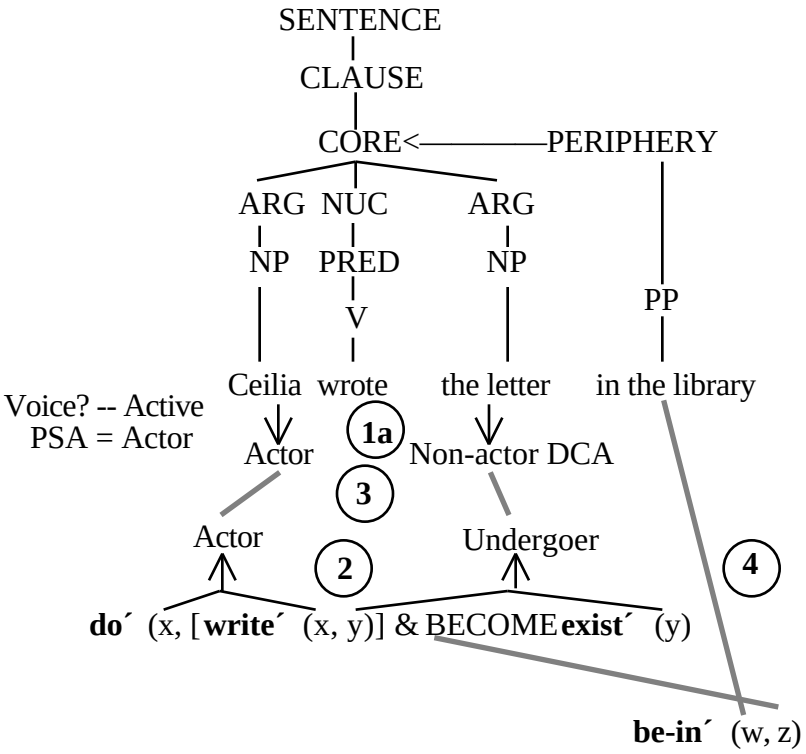
The start of the process is a labelled syntactic representation (which presumably is the output of the parser). Based on recognition of the predicting element in the nucleus, its logical structure is selected from the lexicon. The linking algorithm in (7.36) then comes into play. Since this is an accusative construction, step 1a comes into play, and because the voice is passive, we conclude that the PSA is a non-actor macrorole argument; by step 1a2b, we may conclude that the NP marked with *by* in the periphery is the actor. Step 2 now applies, and the *x* argument of **do´** (x, [**eat´** (x,... is selected as actor and the *y* argument as undergoer. By step 3, we can link the actor from the syntactic representation, *Luigi*, with the actor of the logical structure, the *x* argument, and the non-actor macrorole argument from the syntax, *the pasta*, with the undergoer argument in the logical structure, the *y* argument.



(2) Ceilia wrote the letter in the library.

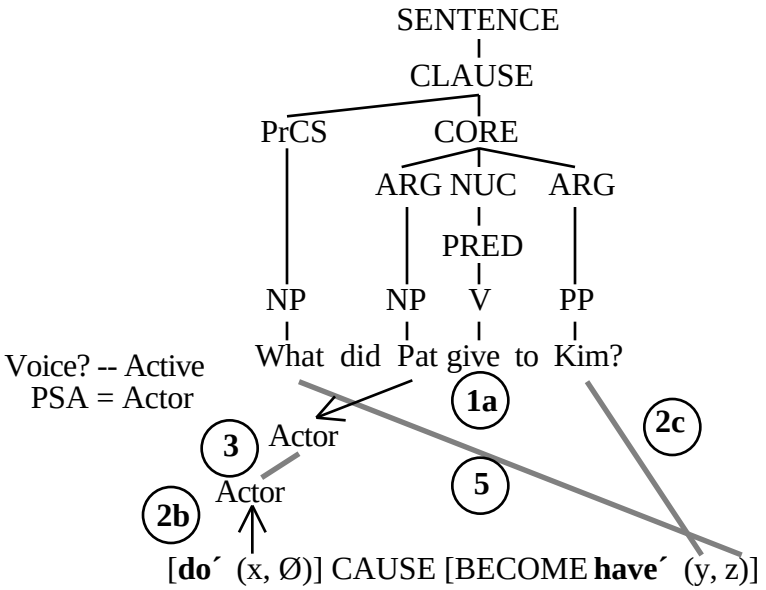
The start of the process is a labelled syntactic representation (which presumably is the output of the parser). Based on recognition of the predicting element in the nucleus, its logical structure is selected from the lexicon. The linking algorithm in (7.36) then comes into play. Since this is an accusative construction, step 1a comes into play, and because the voice is active, we conclude that the PSA is the actor and that the NP immediately following the nucleus is a non-actor direct core argument. Step 2 now applies, and the *x* argument of **do´** (x, [**write´** (x,... is selected as actor and the *y* argument as undergoer. By step 3, we can link the actor from the syntactic representation, *Ceilia*, with the actor of the logical structure, the *x* argument, and the non-actor macrorole argument from the syntax, *the letter*, with the undergoer argument in the logical structure, the *y* argument. There is, in addition, a PP in the periphery, and consequently step 4 comes in to play.

The logical structure for *in* is retrieved from the lexicon, and the object of *in* in the syntax is linked to the first argument position in its logical structure; the whole logical structure of *write* is linked to the second argument position.



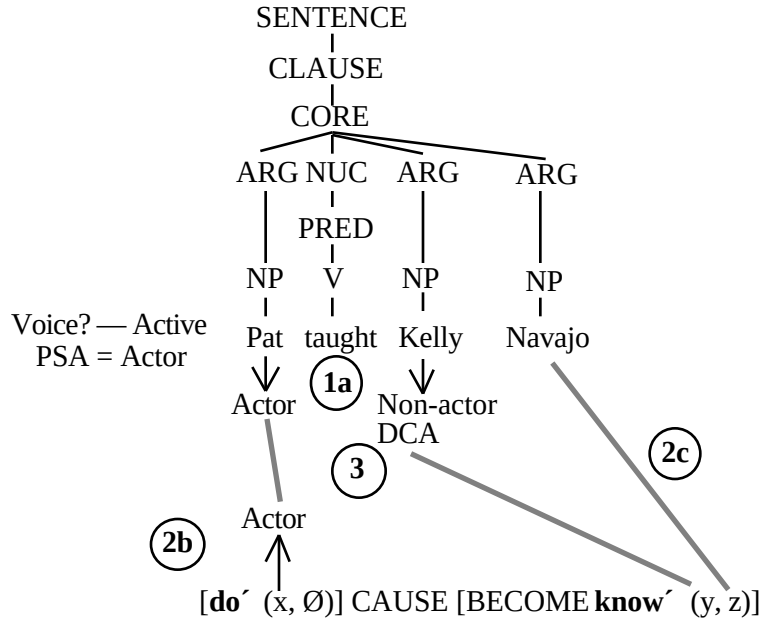
(3) What did Robin give to Kim?

The start of the process is a labelled syntactic representation (which presumably is the output of the parser). Based on recognition of the predicting element in the nucleus, its logical structure is selected from the lexicon. The linking algorithm in (7.36) then comes into play. Since this is an accusative construction, step 1a comes into play, and because the voice is active, we conclude that the PSA is the actor; there is no direct NP after the nucleus, only a PP, and therefore there is no other macrorole argument within the core. Step 2 now applies, and the *x* argument of **do´** (x, Ø) is selected as actor; because this verb allows variable linking to undergoer, no assignment to undergoer can be made. Instead, step 2c comes into play, and since the NP is marked by a locative preposition (*to*), it must be linked to the first argument position in **have´** (y, z). By step 3, we can link the actor from the syntactic representation, *Pat*, with the actor of the logical structure, the *x* argument. There is, in addition, a WH-word in the PrCS, and consequently step 5 comes in to play. There is a single unlinked argument position in the logical structure of *give*, the *z* argument, and accordingly *what* is linked to *z*.



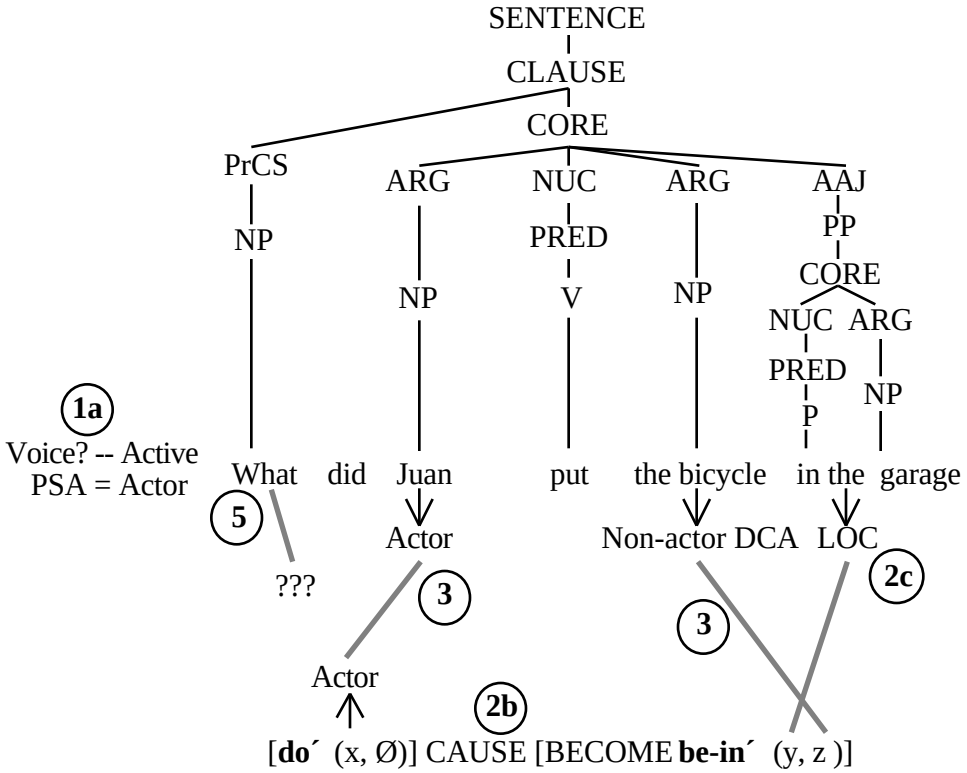
(4) Pat taught Kelly Navajo.

The start of the process is a labelled syntactic representation (which presumably is the output of the parser). Based on recognition of the predicting element in the nucleus, its logical structure is selected from the lexicon. The linking algorithm in (7.36) then comes into play. Since this is an accusative construction, step 1a comes into play, and because the voice is active, we conclude that the PSA is the actor and that the NP immediately following the nucleus is a non-actor direct core argument. Step 2 now applies, and the *x* argument of **do´** (x, Ø) is selected as actor; because this verb allows variable linking to undergoer, no assignment to undergoer can be made. Instead, step 2c comes into play, and since the second postnuclearNP is not marked by a locative preposition, it must be linked to the second argument position in **know´** (y, z). By step 3, we can link the actor from the syntactic representation, *Pat*, with the actor of the logical structure (the *x* argument) and the non-actor direct core argument, *Kelly*, to the remaining unlinked argument position (the *y* argument).

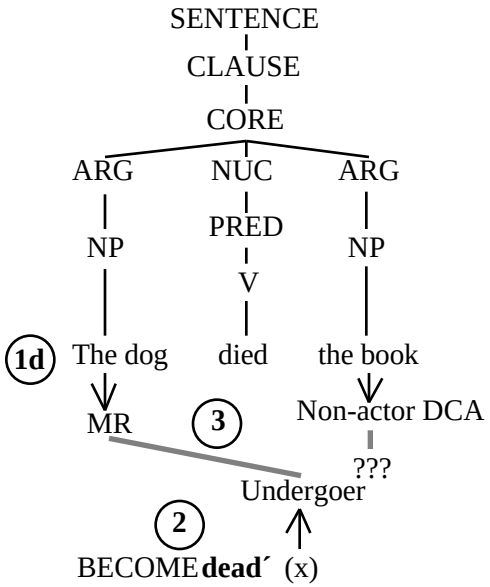


3. Explain the ungrammaticality of (1) and (2). Why is (3b) not a possible logical structure for (3a)? State which aspect of the linking algorithm is violated, and illustrate your answer with a diagram showing the linking.

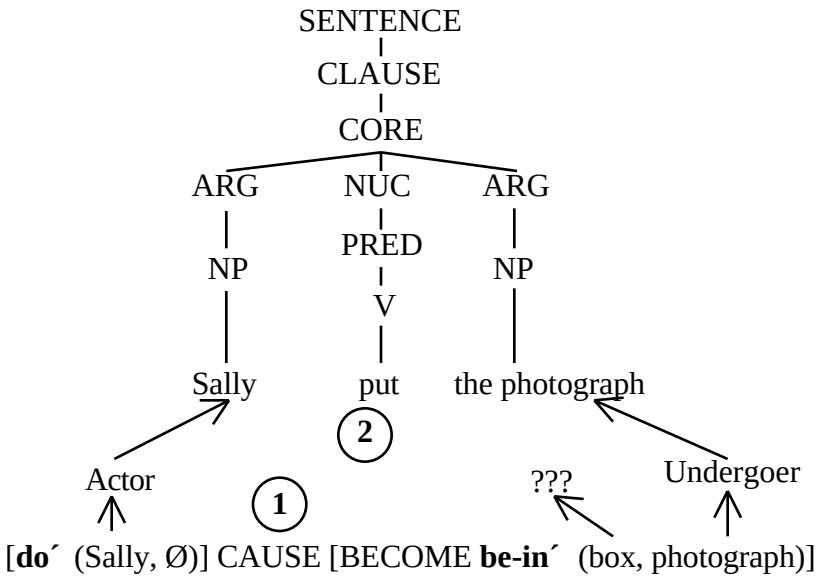
Both (1) and (2) violate the Completeness Constraint, in that there are referring expressions in the syntax that cannot be linked to an argument position in the logical structure of the sentence. In (1), all of the core-internal NPs can be linked, but *what* in the PrCS cannot be. This is illustrated below.



In (2), the post-verbal NP *the book* cannot be linked to the semantic representation, as shown below.



The third sentence violates the Completeness Constraint for the opposite reason, namely, one of the arguments in the logical structure, *box*, is not realized in the syntax.



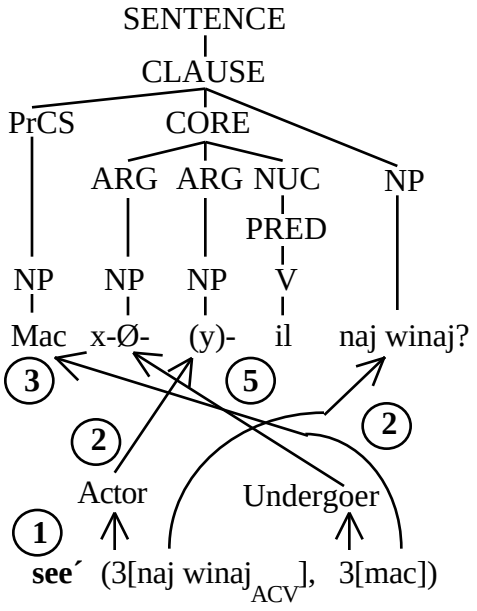
4. Diagram the linking between the semantic representation and the syntactic representation for each of the following sentences. Start from the semantic representation or syntactic representation, as specified, and summarize each step of the process explicitly, following the linking algorithms in (7.12) and (7.36). For the syntactic structures, use only the constituent projection of the sentences; ignore the operator projection. For the semantics to syntax linking, give an account of case marking and agreement/cross-reference.

(1) Jakaltek (Craig 1977) [both semantics → syntax and syntax → semantics]
Mac x-Ø-(y)-il naj winaj?
who PST-3ABS-3ERG-see CL man
'Who did the man see?'

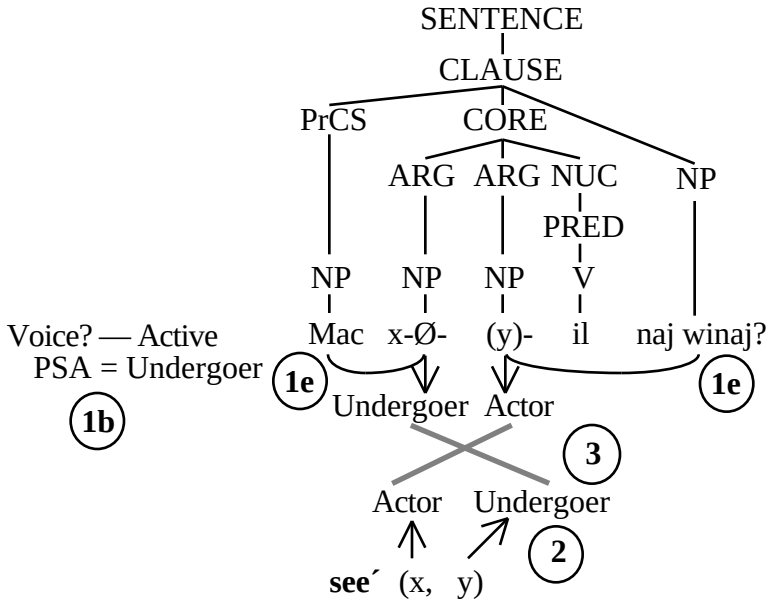
The most important fact about Jakaltek relevant to this exercise is its restricted neutralization for extraction constructions; as shown in Table 6.5 in Chapter 6, there is a [S,U,d-S (antipassive)] pivot for WH-question formation. This means that the interpretation of the WH-word is a function of the voice of the verb. Consequently, the constructional template for this Jakaltek construction would be very similar to the one for the corresponding Sama construction given in Table 7.6.

The first step in the semantics → syntax linking is the selection of the logical structure of the verb from the lexicon and the selection of the lexical items that will fill the argument positions in the logical structure, based in part on the discourse status of their referents. In addition, it is necessary to select the appropriate syntactic template, following the principles in (7.7). Having constituted the semantic representation (minus operators) and selected the appropriate syntactic representation, the linking algorithm in (7.12) now comes into play. An additional complexity in this sentence is that Jakaltek is a head-marking language, and accordingly, each argument slot in the logical structure is doubly filled, as in the Lakhota example in (7.18) and Figure 7.10. In step 1, the first argument of the **see´**, 3[*naj winaj*], is selected as actor, and the second argument of **see´**, 3[*mac*], is selected as undergoer. In step 2, the actor pronominal is linked to its slot in the verb and the undergoer

pronominal to its slot. The actor NP, *naj winaj*, is also linked to its position; because the undergoer NP, *mac*, is [+WH], it cannot be linked by step 2. The WH-word in the semantic representation is linked to the PrCS by step 3. Step 5 applies, realizing the actor pronominal as an ergative bound form and the undergoer pronominal as an absolutive bound form.

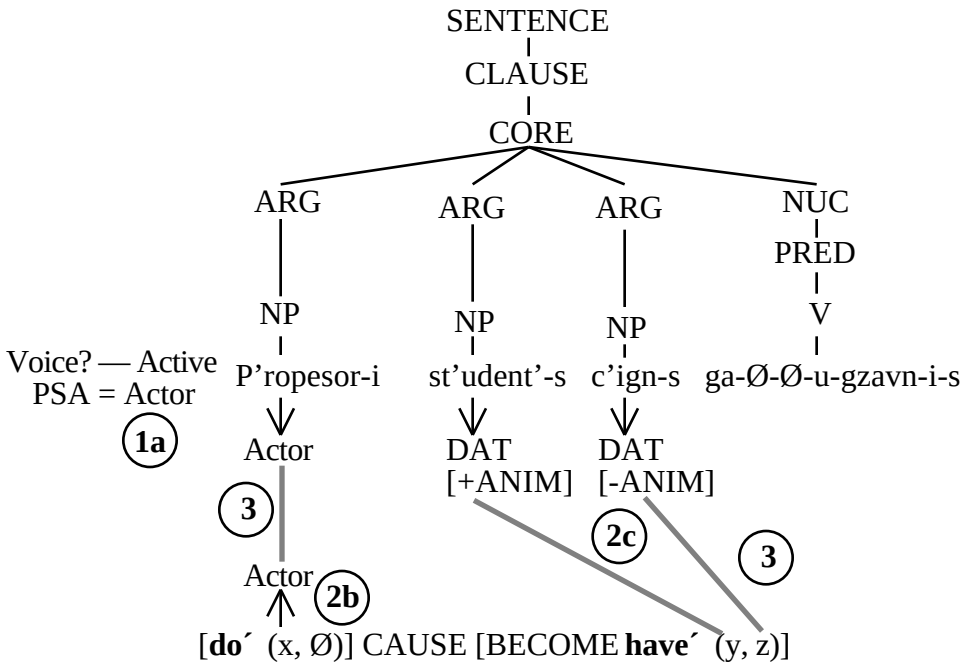


The restriction that WH-words must be the privileged syntactic argument is crucial for the syntax → semantics linking, since it determines the intepretation of the WH-word together with the voice of the verb. The start of the process is a labelled syntactic representation (which presumably is the output of the parser). Based on recognition of the predicating element in the nucleus, its logical structure is selected from the lexicon. The linking algorithm in (7.36) then comes into play. Since this is an ergative construction, step 1b comes into play, and because the voice is active, we conclude that the PSA, the absolutive bound pronominal, is the undergoer and that the ergative bound pronominal is the actor. Since Jakaltek is head-marking, it is necessary to associate the independent NPs with the bound pronominals on the verb. The pivot constraint on WH-question formation requires that the WH-word be the priviliged syntactic argument, which is signalled by the absolutive bound pronominal; hence *mac* 'who' is associated with the abolutive marker and *naj winaj* 'the man' with the ergative marker, following step 1e. Step 2 now applies, and the *x* argument of **see´** (x, y) is selected as actor and the *y* argument as undergoer. By step 3, we can link the actor from the syntactic representation with the actor of the logical structure, the *x* argument and the undergoer to the other argument position, the *y* argument. Step 5 plays no role in Jakaltek, since the interpretation of the WH-word is determined in steps 1b and 1e.



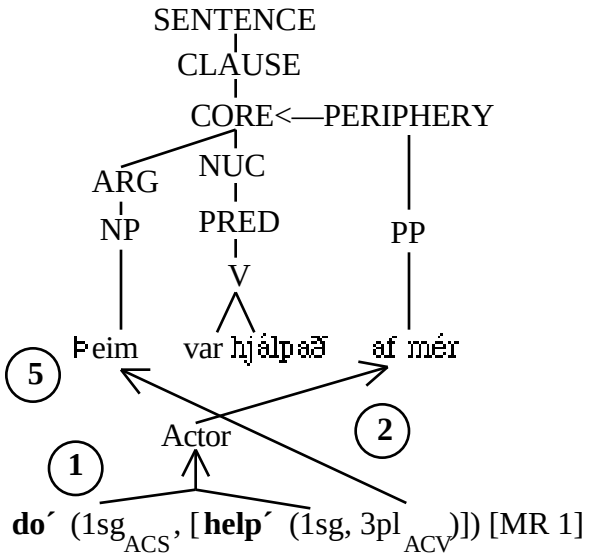
(2) Georgian (Aronson 1991) [syntax → semantics only; treat the markers on the verb as agreement and Georgian as dependent marking]
P'ropesor-i st'udent'-s c'ign-s ga-Ø-Ø-u-gzavn-i-s.
professor-NOM student-DAT book-DAT PVB-3sgU-3sgDCA-PRV-send-FUT-3sgA
'The professor will send the a book to the student.'

This particular clause pattern in Georgian is accusative, and therefore the first step is 1a; since the voice of the verb is active, the priviliged syntactic argument is the actor, which is in the nominative case. We can conclude nothing about the other two arguments, since they bear the same case. Step 2 now applies, and the *x* argument of **do´** (x, Ø) is selected as actor; since there are two possible choices for undergoer, no assignment to undergoer can be made. Instead, step 2c comes into play, but because both NPs are marked by the same case, we cannot use case marking as a cue. Rather, the animacy of the arguments is decisive; on the assumption that the qualia of the NP include information as to animacy, the first NP, *st'udent'*- 'student' is animate and must be linked to the first argument position in **have´** (y, z), following he third option in step 2c. By step 3, we can link the actor from the syntactic representation, *p'ropesor*-, with the actor of the logical structure, the *x* argument and the inanimate dative argument, *c'ign*-, to the remaining unlinked argument position, the *z* argument.

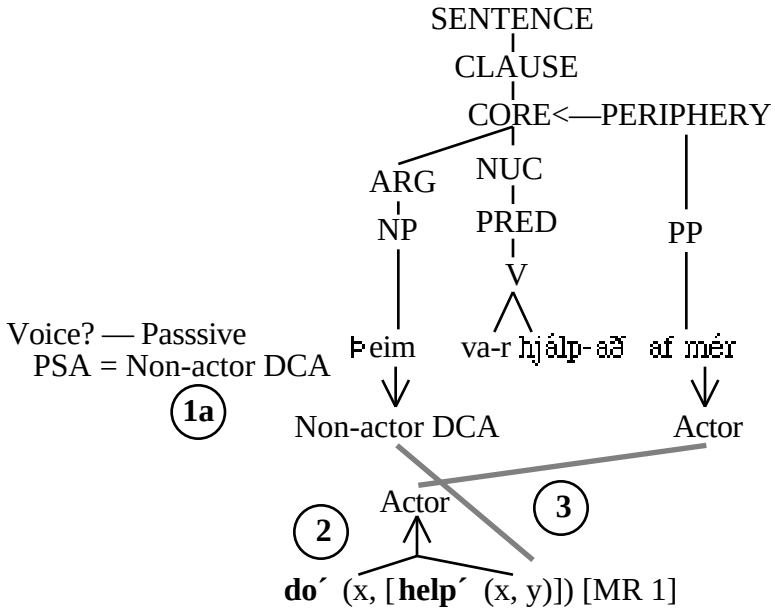


(3) Icelandic [both semantics → syntax and syntax → semantics]
Þeim va-r hjálp-að af mér.
3plDAT be.PAST-3sg help-PSTP by 1sgDAT
'They were helped by me.'

The first step in the semantics → syntax linking is the selection of the logical structure of the verb from the lexicon and the selection of the lexical items that will fill the argument positions in the logical structure, based in part on the discourse status of their referents. In addition, it is necessary to select the appropriate syntactic template, following the principles in (7.7). Having constituted the semantic representation (minus operators) and selected the appropriate syntactic representation, the linking algorithm in (7.12) now comes into play. In step 1, the first argument **do´** is selected as actor. Because the verb is specified as 'MR1' in the lexicon, there is only one macrorole. In step 2, since this is an passive voice linking, the actor appears as an adjunct in the periphery; and because the Icelandic PSA selection hierarchy refers to direct core arguments instead of macroroles, the *y* argument functions as PSA in the clause. Step 5 now applies. Because the nominative case and finite verb agreement rules for Icelandic refer to core macroroles, they cannot apply; the dative rule does apply, assigning dative case to the 3pl PSA argument, and the finite verb appears in the impersonal form. The actor NP is assigned dative case by the preposition *af*.



The start of the syntax → semantics linking is a labelled syntactic representation (which presumably is the output of the parser). Based on recognition of the predicating element in the nucleus, its logical structure is selected from the lexicon. The linking algorithm in (7.36) then comes into play. Since this is an accusative construction, step 1a comes into play, and because the voice is passive, we conclude that the PSA cannot be the actor; the most that can be concluded for Icelandic is that the PSA is a non-actor direct core argument, and the actor is the object of the preposition *af* in the periphery. Step 2 now applies, and the *x* argument of **do´** (x, [**help´** (x, y)]) is selected as actor, but the *y* argument is not selected as undergoer, due to the 'MR 1' feature. By step 3, we can link the actor from the syntactic representation with the actor of the logical structure, the *x* argument and the non-actor direct core argument to the other argument position, the *y* argument.



5. Formulate a partial syntax → semantics linking algorithm for Plains Cree, based on the examples in (7.70)-(7.73). Give only those steps that would apply to these examples. If steps of a

new type are needed, justify and explain them. How does the linking algorithm for this language differ from those for the other languages discussed in the text?

In certain respects, Plains Cree is like other languages that have been discussed, i.e. head-marking languages. What is unique about it is the 'direction marking' on the verb which determines the interpretation of the arguments in the clause. Consequently, the first step would involve the interpretation of the direction marking.[1] The algorithm is given in (1).

(1) Syntax → semantics linking algorithm for Plains Cree
    1. Ascertain the argument marking of a transitive verb:
        a. Determine the person and number of the arguments from the bound markers on the verb.
        b. If there are independent NPs in the clause, associate each NP with a bound argument marker.
        c. Interpret the direction marking on the verb:
            1. If the verb carries the 'direct' marker, then interpret the highest ranking argument in terms of the hierarchy in (7.69) as the actor and the lower ranking argument as the undergoer.
            2. If the verb carries the 'inverse' marker, then interpret the highest ranking argument in terms of the hierarchy in (7.69) as the undergoer and the lower ranking argument as the actor.
    2. Retrieve from the lexicon the logical structure of the predicate in the nucleus of the clause and with respect to it execute step (1) from (7.12).
    3. Link the arguments determined in step 1 with the arguments determined in step 2 until all core arguments are linked.

We can illustrate the working of the algorithm in the examples in (7.71), repeated below.

(7.71) a. Ni-wāpam-ā-w (nāpēw-Ø).
1sg-see-DCT-3sg (man-PROX)
'I see him (the man).'
b. Ni-wāpam-ik (nāpēw-Ø)
[< ni-wāpam-ekw-w]
1sg-see-INV-3sg (man-PROX)
'He (the man) sees me.'

In (7.71) we first determine that the verb has first singular and third singular arguments, as signalled by the *ni-* '1sg' prefix and the *-w* '3sg' suffix on the verb. This is step 1a. The next step is associate the independent NP with one of these markers; since it is third person, it can be associated only with the third person suffix. The final part of step 1 is the interpretation of the direction marker; in (a) it is direct, which means that the first person argument is the actor and the third person argument is the undergoer, whereas in (b) is it inverse, which means that the first person argument is the undergoer and the third person argument is the actor. The remainder of the linking is as for other language types. Given the logical structure for wāpam, **see´** (x, y), the *x* argument is the actor and the *y* argument the undergoer. In step 3 these are linked to the output of

[1]This only applies to transitive verbs with two animate arguments, which are referred to in the Algonquianist literature as 'transitive animate verbs'. Direction marking is not a feature of intransitive verbs nor of transitive verbs which take an animate actor and an inanimate undergoer.

part three of step 1, yielding the correct interpretations.

6. Consider the Dyirbal comitative construction in (7.33), from Dixon (1972); is it a lexical or a syntactic phenomenon? Consider also the -ŋay antipassive construction discussed in chapter 6; an example is repeated in (1b) below. Given the interaction between these two constructions, illustrated in (2c), is the -ŋay antipassive a lexical or a syntactic phenomenon? Give a brief informal description of the semantics → syntax linking in (2c). Note: *-nay* in (2b,c) is an allomorph of -ŋay. (2c), despite the translation, is a single clause with a single verb in Dyirbal.

The crucial fact about the comitative construction for this exercise is that it only applies to M-intransitive verbs and derives M-transitive verbs; that is, it takes a verb which takes only an actor argument and adds a second macrorole, an undergoer. This is illustrated in the examples in (7.33) involving the verb *dyanay* 'stand'. Because this construction affects the argument structure of the verb by adding a macrorole, it must be a lexical phenomenon; the comitative rule operates in the lexicon to derive M-transitive verbs from M-intransitive verbs.

What, then, is the status of the -ŋay antipassive construction? One of its effects is that it creates a derived intransitive verb. Let us assume that its function is to reduce the valence of the verb by 1 by blocking the assignment of an argument to undergoer. The single remaining macrorole would be the actor, and the argument that would be the undergoer in the unmarked form is a non-macrorole direct core argument. Given this, the case marking rules in (7.61) correctly predict the case pattern in the construction: the actor is absolutive, and the other argument is dative. If this analysis is correct, then the result of the -ŋay antipassive is a derived M-intransitive verb, and this is the kind of verb that can occur in the comitative construction, as we saw above. Hence there are two reasons for concluding that the -ŋay antipassive, like the comitative construction, is a lexical phenomenon. First, it affects the argument structure of a verb, in particular its M-transitivity. Second, and more important, it is the input to a lexical phenomenon, the comitative construction, and given the nature of the linking algorithm, it would be impossible for a lexical rule to have as its input the output of a syntactic linking option. Thus, we must conclude that the -ŋay antipassive is a lexical phenomenon like the comitative construction.

An informal description of the semantics → syntax linking in (2c) would go as follows. The result of the -ŋay antipassive is a derived M-intransitive form of the verb ɲuga 'grind' which has an actor and a non-macrorole argument. The addition of the comitative suffix *-mbal* signals the addition of a second macrorole argument, which is an undergoer. Hence the effector of ɲuga 'grind' is the actor of the doubly derived verb and the argument added by *-mbal* is the undergoer; the second argument of ɲuga is a non-macrorole direct core argument. Following the case assignment rules in (7.61), the actor will be ergative, the undergoer will be absolutive, and the non-macrorole direct core argument will be dative, and this is what is found in (2c).

This has interesting implications for the contrast between PSA-modulation and argument-modulation voice constructions discussed in Chapter 6. It was noted at the end of §7.4.2 that argument-modulation voice constructions are lexical in nature, and one might reasonably infer from this that PSA-modulation constructions are syntactic in nature, which is true in general. But Dyirbal presents an interesting exception to this trend, since the -ŋay antipassive, which is clearly a PSA-modulation construction functionally, is nevertheless lexical and not syntactic. This is possible because lexical operations have definite syntactic consequences. It also reinforces the point made in §§7.6.2 and 7.6.3 that discourse-pragmatics can have an effect at all steps in the linking, because the -ŋay antipassive is crucially involved in the constitution of the pragmatic pivot in Dyirbal, as we saw in Chapter 6.

7. Explain the ungrammaticality of the following sentences.

(1) *Tanisha$_i$'s brother helped herself$_i$.
(2) *Herself$_i$ frightened Sally$_i$.
(3) *Sam asked herself$_i$ about Wendy$_i$.
(4) *Bill showed the picture of Karen$_i$ to herself$_i$.

The logical structure for each of these sentences is given below.

(1´) **do´** ([**have.as.kin´** (Tanisha$_i$, brother)], [**help´** ([**have.as.kin´** (Tanisha, brother)], herself$_i$)])
(2´) [**do´** (herself$_i$, Ø)] CAUSE [**feel´** (Sally$_i$, [**afraid.of´** (herself$_i$])]
(3´) **do´** (Sam, [**express.**(α)**.to.**(β)**.in.language.**(γ)´ (Sam, herself$_i$)]) [**about´** (Wendy$_i$)], where α = *about Wendy* and β =*herself.*
(4´) [**do´** (Bill, Ø)] CAUSE [BECOME **see´** (herself$_i$, [**be´** (picture, [**of´** (Karen$_i$)])])]

The logical structure in (1´) violates the LS-superiority Condition in (7.120b), as does the one in (4´), since the reflexive *herself* is LS-superior to the antecedent *Tanisha*. The logical structure in (3´) violates the Role Hierarchy Condition, since the reflexive is the undergoer and the antecedent is an oblique core argument. The problem with the logical structure in (2´) is a bit subtle. (2) is similar in certain respects to the examples in (7.124), which are grammatical. The difference between the logical structure in (2´) and those in (7.126) is that while all of them contain a subpart which meets the Role Hierarchy and LS-superiority Conditions, the logical structures in (7.126) do not contain a subpart which violates them, whereas (2´) does: *herself* is the actor of *frighten* and *Sally* is the undergoer, violating the Role Hierarchy Condition.

8. Explain the constraints on reflexivization in Toba Batak; the data are from Shugamoto (1984). Build on the analysis of Toba Batak you did in exercise 2 in Chapter 6.

The examples in (1), which were also part of exercise 2 in Chapter 6, show that the antecedent must be the actor and the reflexive the undergoer, regardless of which one is the privileged syntactic argument. The data in (2) and (3) introduce ditransitive verbs, and from them we can conclude that the Role Hierarchy Condition in Toba Batak is based on the same hierarchy as in English, namely Actor > Undergoer > Other. In the examples in (2), the reflexive is the undergoer, and there are two NPs in the clause, *si Torus* (the actor) and *si Ria* (oblique core argument). The examples are not ambiguous, however, because only *si Torus*, the actor, meets the Role Hierarchy Condition, and therefore it is the only possible antecedent. In (3), on the other hand, *si Ria* is the undergoer and the reflexive is an oblique core argument. In these sentences there are two NPs which satisfy the Role Hierachy Conidtion, the actor (*si Torus*) and the undergoer (*si Ria*), and accordingly, the sentences are predicted to be ambiguous, which they are.