2

Cyclical change and problems of projection

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2.1 Introduction

A linguistic cycle describes a regular pattern of language, a round of linguistic changes taking place in a systematic manner and direction. For instance, an independent pronoun may come to be dependent on a verb and be reanalysed as agreement and the independent pronoun may be renewed through a noun or demonstrative. These changes involve phrases (e.g. independent pronouns) reanalysing as heads (e.g. agreement) and adjuncts as renewed specifiers. Heads are also reanalysed as higher heads, but these will not be discussed in this chapter.

Because the older phrases and heads are renewed, these changes are seen as cyclical, as argued in, for instance, van Gelderen (2008; 2011). The formal explanation for these cyclical changes is that, during acquisition, principles of economy predispose the learner to use simpler structures and features (van Gelderen 2004). The urge of speakers to be innovative may introduce new, loosely adjoined elements into the structure. In this chapter, I show that it is possible to see these changes as solutions to labelling problems.

Chomsky (2013; 2015) advocates a system of free merge where labelling (of TP, DP, etc.) is done via a labelling algorithm (LA) because labelling is needed at the interface levels. This framework is known as the Problems of Projection (hence PoP) approach. When a head and a phrase merge, the LA automatically determines the head to be the label. However, in cases where two phrases merge, the LA cannot find the head and this results in a labelling problem. One of the phrases has to either move or share features with the other. In this chapter, I argue that the problematic merge of two phrases can be resolved in another way and this process is evident in language change, namely as a change from phrase to head. The change away from adverbials involves a reanalysis of pair-merge as set-merge, as in Chomsky (2000).

The reanalyses of phrases as heads are varied: (a) subject and object pronouns to agreement, i.e. DPs to T and v heads, respectively, (b) demonstratives to C, D, and

Cycles in Language Change. First edition. Anne Breitbarth, Miriam Bouzouita, Lieven Danckaert, and Elisabeth Witzenhausen (eds).

T heads, (c) *wh*-elements to C heads, (d) Adverb Phrases to ASP heads. There are additional changes of this type, e.g. PP to C heads and negative adverbs to Neg heads, but I have chosen to focus on changes that are very frequent (those in (a) and (b)) and those that are less frequent ((c) and (d)). As phrases reanalyse as heads, new phrases arise again. I look at one of these, i.e. the renewal of the subject from a topic.

I argue that all these changes provide insight into some of the labelling mechanisms, e.g. simple search is preferred over sharing features and sharing features (set-merge) is selected over pair-merge. Each of the cases will be exemplified and discussed in terms of labelling. Section 2.2 will outline the basics of Chomsky (2013; 2015; 2016). Section 2.3 will provide a few instances of reanalysis of the subject and object DP to a T and v head, from French and Athabaskan languages, respectively. Section 2.4 is on the changes affecting demonstrative pronouns. They reanalyse as articles, complementizers, and copulas. I will provide a number of scenarios on what might prompt the reanalysis. Section 2.5 will examine further sources for C-heads, namely *wh*-elements, and will consider Adverb Phrases as they change to ASP. Section 2.6 turns to the change from adjunct to specifier. Section 2.7 is a conclusion.

2.2. From projection to the labelling algorithm (LA)

Early Phrase Structure Grammar (e.g. Chomsky 1965) and X'-bar theory (e.g. Jackendoff 1977) take for granted that a phrase is headed and expands to a maximal projection with a specifier, head, and complement. This X'-schema is seen by many as perhaps one of the greatest insights into syntactic structure. The spirit of the current Minimalist Program (Chomsky 1995 to the present), however, is to attribute as little as possible to the computation, restricting it to simple merge with a labelling algorithm needed for the conceptual–intentional interface.

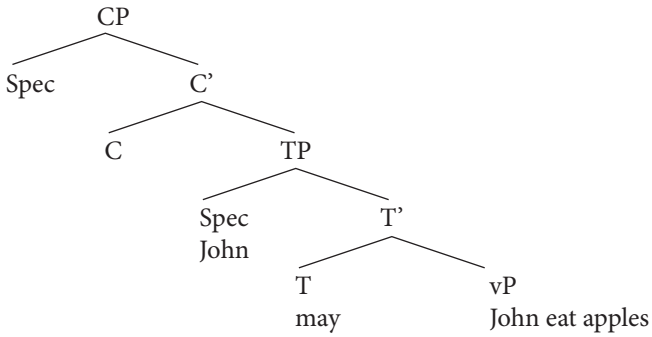
In early Generative Grammar (e.g. Chomsky 1965: 85), language-specific phrase structure rules, such as (1), are responsible for generating sentence structure. (1a) generates the basic sentence and (1b) the Verb Phrase. Chomsky (1970) and, especially, Jackendoff (1977: 17) reformulate these rules as a category-independent and language-independent schema, as given in (2).

(1) a. S → NP VP
    b. VP → V NP

(2) a. XP → YP X'
    b. X' → X ZP

In the mid-1980s, the X'-schema of (2) is extended to grammatical categories, such as T, C, and D, and the result is the familiar structure in (3), again with the head determining the label of the higher phrase.

(3)



Taking the Minimalist Program seriously means attributing less and less to Universal Grammar, in particular to rules such as (2), and restricting the generative part of a derivation to a computational operation called Merge. External Merge (EM) takes two objects and yields an unordered set {X, Y} without a label (Chomsky 2013: 42); Internal Merge (IM) takes an already formed syntactic object and takes part of that and merges it with the original syntactic object. Labelling the set is not part of Merge and should therefore be avoided and left as a requirement of the interface. Not much is said about this requirement. Chomsky (2015: 2) assumes that 'for interpretation, syntactic objects must be labeled' where, in an unpublished manuscript, he requires labeling 'at the CI interface, and for the rules of externalization'. I will briefly come back to labels and interpretability when comparing the phi-features to the Q-features, but do not have much to add otherwise.

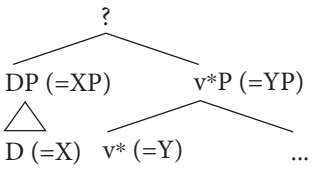
The labelling algorithm (LA), stated in (4a), involves just a minimal search and 'must take place at the phase level, as part of the Transfer operation' (Chomsky 2015: 6). It is like Agree, not Match, and part of Minimal Computation, i.e. a third-factor effect. Rizzi (2014: 12) formulates it slightly differently, as in (4b).

(4) a. The **Labelling Algorithm** is 'a special case of minimal search' seeking 'heads H within its search domain'. (Chomsky 2015: 6)

b. **Labelling Algorithm**: The category created by Merge receives the label of the closest head. Labelling must be complete at the interfaces. (Rizzi 2014: 12)

There are three potential sets in need of labels, namely {X, YP}, {XP, YP}, and {X, Y}. The first case is unproblematic—Chomsky says 'trivial'—because the LA selects the head X in accordance with (4a). The other two are 'interesting' because there is no unambiguous label assigned by the LA. Subjects in English exemplify {XP, YP} and the resolution to their labelling, IM, forces movement without having to rely on EPP features, a desired consequence. Thus, in (5), a label cannot be found because both X and Y are as accessible to minimal search and therefore appropriate as labels.

(5)



Chomsky (2013: 43) provides two solutions to labelling problems such as these: 'There are, then, two ways in which [syntactic object] SO can be labeled: (A) modify SO so that there is only one visible head, or (B) X and Y are identical in a relevant respect, providing the same label, which can be taken as the label of the SO. These are the two cases that are prominently found'.

Solution (A) applies in (5): the DP must move, after which the v*P can be labelled. Other examples where the {XP, YP} set can be modified through movement of one of the maximal projections is the movement of a phrase out of a copula clause. Movement of one of the maximal projections, as in (6), would result in a structure that can be labelled. According to Chomsky (2013: 44), '[t]he intuitive idea is that the lower XP copy [in (6)] is invisible to LA, since it is part of a discontinuous element, so therefore β will receive the label of YP'.

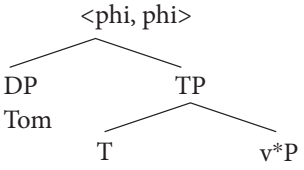
(6) XP copula {β XP, YP} (Chomsky 2013: 44)

Although β receives a label in (6), as does v*P in (5), both result in other cases of {XP, YP}. Assuming the next merge will be a T in (5) and that the copula is in T in (6), the result is the well-known issue that subjects in English face: they are drawn to Spec TP. Instead of positing EPP-features, labelling requirements in (5) and (6) force DP-movement. The result, given in (7), is an unlabelled α because the subject internally merges to the TP resulting in {XP, YP}.

(7) α[Tom T [Tom v* read a book]] (adapted from Chomsky 2015: 10)

In this case, solution (B) applies since the heads of the DP and TP share phi-features, and the set is successfully labelled <phi, phi> as shown in (8).

(8)



Not much is said on the nature of <phi, phi>. I assume it to be person and number features but it might as well be just number since subjects that move to the Specifier of TP agree more consistently in number with their verb than subjects that do not (van Gelderen 1997). This has been known since Greenberg (1963: 112) as Universal

33 ('When number agreement between the noun and verb is suspended and the rule is based on order, the case is always one in which the verb precedes and the verb is in the singular'). I leave this issue aside.

This second solution to the labelling problem can be exemplified by means of *wh*-constructions as well. If 'the most prominent feature of the {XP, YP} set "is shared"', labelling is not a problem. It will be labelled using 'the interrogative feature Q, a feature of C and the head of α' in (9a) (Chomsky 2013: 45). Sharing the Q-features between the PP and C in (9a) has the result that the PP does not move further, as the ungrammatical (9b) shows.

(9) a. They wondered [α in which Texas city [C [JFK was assassinated]]]
b. *In which city did they wonder JFK was assassinated.

The fact that the *wh*-element cannot move further from (9a) to (9b) is called the 'halting problem' or 'criterial freezing' in Rizzi (2006; 2014), the basic intuition being that the *wh*-element included in the PP shares contradicting features: *y/n* for the embedded C and *wh* for the main clause. Once it has shared features in the embedded CP, it is frozen.

Labelling resolutions also provide an account for the *that*-trace effect in (10a): α cannot be labelled by the phase head C if *who* has moved. When the phase-head C deletes, as in (10b), it transfers phasehood to T and *who* can remain in Spec TP until it is moved in the next phase.

(10) a. * [γ Who do you v* [ε think [δ C that [α t T read the book]]]]
b. [γ Who do you v* [ε think [δ C [α t T read the book]]]]

(Chomsky 2015: 10–11)

Apart from {XP, YP} being challenging, the set {X, Y} is problematic. Here Chomsky (2013: 47) says that this applies when one of the heads is a root and the other a functional element determining its category. If roots do not count as labels, no problem arises. Chomsky (2015: 12) mentions another case of head-movement, namely to T and v* and here 'T [is] affixed to V. More generally, the conventional theory of head-raising seems to have the story backwards: the host should be affixed to the raised element' so these are not cases of {X, Y} because 'the affix is invisible to the labeling algorithm'. See Carstens, Hornstein, & Seely (2013) as well.

Labelling paradoxes can be resolved by having one of the XPs move, as in (5) and (6), or by ignoring one label (the root), or by feature-sharing in (8) and (9a). The first two solutions are worked out in Chomsky (2013), whereas the latter is the focus of Chomsky (2015). I now turn to some linguistic changes that may be accounted for by the requirements of the labelling algorithm. I will also discuss some changes that do not occur and why these may not be a problem for the labelling algorithm. Other work showing phrase to head reanalysis appears as Jäger (2005; 2010b), Weiß (2007), Willis (2007), Bayer & Brandner (2008), Bácskai-Atkári & Dekány (2014).

2.3 Subjects to T and objects to v*

In this section, I first sketch a typical subject cycle and provide an explanation from a labelling perspective for the first part of the cycle. I then move to the object cycle and do the same.

2.3.1 The subject cycle

The typical stages of the subject cycle are given in (11) where English words are used for convenience.

(11) a. They (often) eat tomatoes.
b. They'eat tomatoes.
c. (Them) th'eat tomatoes.
d. Them (often) eat tomatoes.

In (11a), the pronoun is fully independent and need not be adjacent to the finite verb whereas, in (11b), it is cliticized to the verb. If the pronoun is interpreted as agreement marker, this stage will be one of null subject (or pro-drop). In (11c), the earlier independent pronoun is renewed by a new one that is ambiguous between being in topic or in subject position. If *them* is in topic position, the clitic could still count as the subject; if *them* is the subject, the clitic is now a marker on the verb. Stage (11d) is the same as (11a) with a renewed subject pronoun. Diagnostics to decide between topics and subjects include that the former need to be definite, whereas the latter can be quantifiers and indefinites. Once a quantifier appears in (11c), it is a subject. Languages can thus be seen as being in different stages of the cycle; they can have just subject pronouns, just agreement, or both.

If languages acquire agreement markers from erstwhile pronouns, one expects them to resemble these and that is indeed the case in many languages. This means the forms are available in the lexicon with different sets of features. According to Tauli (1958: 99, the Basque verbal prefixes *n-*, *g-*, *z-* are identical to the pronouns *ni* 'I', *gu* 'we', and *zu* 'you'. As early as the nineteenth century, Proto-Indo-European verbal endings *-mi*, *si*, *-ti* are considered to arise from first, second, and third person pronouns (e.g. Bopp 1816). Hale (1973: 340) argues that in Pama-Nyungan inflectional markers are derived from independent pronouns: 'the source of pronominal clitics in Walbiri is in fact independent pronouns'. Likewise, Mithun (1991) claims that Iroquoian agreement markers derive from Proto-Iroquoian pronouns and Haugen (2008) argues that Nahuatl agreement markers derive from earlier forms. Fuß (2005) and van Gelderen (2011) cite many additional examples.

A language where we have evidence of all the stages in (11) is French. Old French has optional pronouns that need not be adjacent to the verb, as (12) shows for the second person singular *tu* 'you'.

(12) Si con **tu** meismes le preuves (Old French)
If when you self it prove
'If you prove it yourself' (http://romandelarose.org, Selden Supra 57, 40v)

Foulet (1961: 330) confirms that all personal pronouns can be separated from the verb in Old French. By the time of Modern (colloquial) French, *je* and *tu* obligatorily precede the finite verb, as the ungrammaticality of (13) shows[1]. See Kayne (1975: 82–5) for additional arguments. In addition, a frequent renewal in the form of *moi* (and *toi*) appears, as in (14)[2].

(13) *Je/tu probablement ai/as lu ça (Colloquial French)
1SG/2SG probably have read that
'I've probably read that.'

(14) euh **moi je** trouve ce qui en souffre le plus… (Colloquial French)
Eh me 1SG find that who of.it suffers the most
'I think that the one that suffers the most is…' (*Orléans Corpus*).

If we look at which pronouns are the first ones to grammaticalize into agreement markers, they are typically the first- and second-person singular ones. For instance, since Lambrecht (1981), it has been argued that French weak pronouns such as *je* 'I' and *tu* 'you.SG' are agreement markers on the verb and frequently doubled, as in (14). What has also been known for a long time is that third-person subject pronouns are slower to gain agreement status. To be an agreement marker, a third-person subject pronoun would have to appear obligatorily and that is not the case in most varieties of French. Most indefinite subjects are not doubled except in a few varieties, as in (15) from Spoken Swiss French.

(15) Si un: **un Russe i** va en france… (Swiss Spoken French)
If a a Russian 3SG goes to France
'If a Russian goes to France' (Fonseca-Greber 2000: 335)

The reason the third person is 'slow' is that there are more features to be shared, e.g. gender. Gender and possibly number are in fact deleted when the pronoun becomes the agreement marker, as in (16), where *i* is marked for only third person (singular or plural) although *les tomates* are feminine plural.

(16) **Les tomates,** i sont encore vertes (Spoken French)
the tomatoes 3 are still green-P
'The tomatoEs, they are still green.' (Lambrecht 1981: 40)

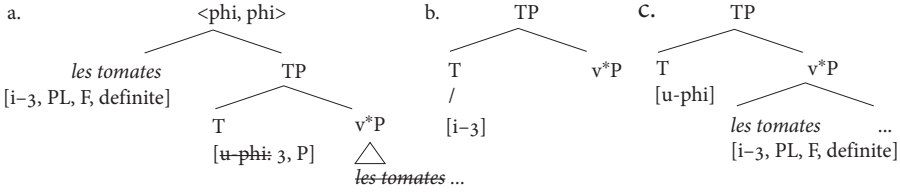
[1] Because the status of the Modern French markers is debated, I use 1SG, 2SG, etc. to gloss them.

[2] In the *Corpus d'entretiens spontanés*, this doubling occurs in 8.5% with first person (239 out of 2818 *je/j'*) and, in the *Orléans Corpus*, it occurs in 13% of the first-person singulars (187 out of 1424 *je/j'*). This corpus is part of the *ELICOP Corpus*.

As mentioned, Chomsky argues that DP and TP in (8) must share phi-features in order to be labelled. These features are not D or T but person and number and this, I will argue, makes a reanalysis possible. Let us look at the stages of the cycle.

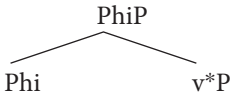
As (17a) shows, a full phrase in subject position and T share person and number and the DP cannot be mistaken by the language learner for an agreement morpheme. Pronouns are ambiguous and, once they have lost definite and gender features, they can be reanalysed as T, either as a T with interpretable features, as in (17b), or with uninterpretable ones in (17c). Once the phi-features are uninterpretable, a new subject is necessary, as in (17c), something that will be discussed in section 2.6.

(17)



Thus, a very straightforward escape from the labelling paradox in (5) and (6) would be to have a subject that has the status of a head. Chomsky (2013: 46) says that (pronoun) subjects cannot be heads because they would label the TP incorrectly, as D-headed, not T-headed. What I will argue is that the features of T in (17) are in fact agreement features and not T. This explains why pronouns change from phonologically fully independent phrases to agreement markers, as has happened in a number of languages, perhaps the most well-known case being French (see Lambrecht 1981; Roberts & Roussou 2003). A fully phrasal pronoun (that can be coordinated and modified) cannot be seen as having the same agreement features as T and can only be labelled as <phi,phi>. A head (that has to be adjacent to a verb) can be seen by the child acquiring French (or English) as similar in features to T. When the features of a pronoun overlap with those of the agreeing T, they may disappear and a structure as in (18) may be the result. This structure can, of course, receive a label.

(18)



This account is very similar to accounts such as those of Roberts (2010a) and van Gelderen (2011) who suggest the change from pronoun to agreement marker is due to a confusion as to whether the pronoun actually values the features of T or is itself in need of valuation. Taking Chomsky's idea of feature-sharing, the preference for subjects that are heads with minimal features similarly makes sense. Let us look at how the two scenarios work in the most recent version of PoP.

In Chomsky (2016), the T merges with the v*P and the subject moves internally (to Spec TP), after which C is merged. There are, of course, no labels, such as C or T, or branches, just features, but I have added the labels and branches for convenience. C has uninterpretable agreement features (u-phi) which it values with the subject before transferring the features to T. Once this happens, the {DP, TP} sequence can be labelled as <phi, phi> after it arrives at the interface. In the scenario I argue for, given in figure 2.1, the DP with its interpretable phi-features is reanalysed as head and valuation and labelling occur without a need to transfer features.

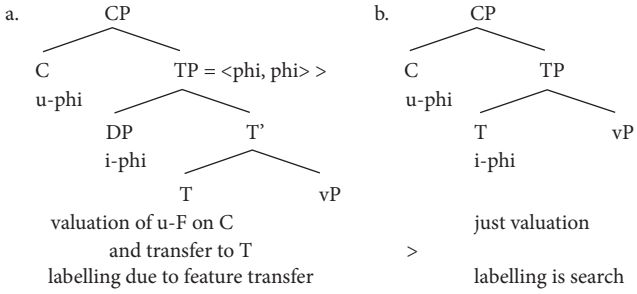


FIGURE 2.1 Reanalysis of the subject resulting in simpler labelling

After the pronoun is reanalysed as agreement, there is optional renewal in many languages, as (14) to (16) show. I come back to this in section 2.4.

2.3.2 *The object cycle*

I will now turn to the object cycle, which was identified in e.g. Givón (1976). A typical object cycle is given in (19), again a fictitious case for ease of exposition. Let us say that a language has a fully independent object pronoun, as in stage (19a). Since this pronoun can be coordinated and modified and need not be close to a verb, it is a full phrase. A possible optional next stage is for speakers to analyse this object pronoun as a head, as in (19b). This head cannot be coordinated or modified and is phonologically dependent on the verb. The next stage might be for the object to be reanalysed as an agreement marker. Once it has uninterpretable features, it could be renewed through an emphatic or some other form, as in (19c). The last stage, as in (19d), is similar to the first with the emphatic counting as the regular argument.

(19) a. I saw yesterday her (and him).
b. I saw 'r (*her).
c. I saw'r HER.
d. I saw her.

French shows an object cycle, as argued in Bahtchevanova and van Gelderen (2016). Here, I will give some examples from other languages. In the Athabaskan family, there is a change from northern languages to southern ones in going from (19b) to

(19c). A representative of a northern language is Kaska and of a southern one Navajo (see further van Gelderen 2011: 113–15). In Kaska, the incorporated pronoun is in complementary distribution with another noun, as (20) shows, whereas it is obligatory in Navajo (21), indicating it is agreement.

(20) a. **me**ganehtan (Kaska)
me-ga-ne-o-h-tan
3SG-at-ASP-3SG-CLF-look
'He looks at her.'

b. **ayudeni** ganehtan
girl at-ASP-3SG-CLF-look
He looks at the girl(s). (Jelinek 2001)

(21) a. **'atoo'** **yí**-ní-dlaa'-ísh (Navajo)
soup 3SG-2SG-eat-Q
'Did you eat the soup?'

b. **yí**-ní-dlaa'-ísh
3SG-2SG-eat-Q,
'Did you eat it?' (Jelinek 2001: 23)

Other languages are in various intermediate stages, e.g. Persian (22) has what looks like an affix but is still incompatible with a full object and varieties of Arabic restrict (23) to certain persons, while Kosrean (24) shows a doubling that makes the verbal marker into agreement.

(22) pursed-am-**ash** (Persian)
asked-1SG-3SG
'I asked him.'

(23) ʃuft-**ik** **ʔinti** ((some) Arabic)
saw.1SG-2SG you
'I saw you.'

(24) Nga kihte-**l** **sah** (Kosraen)
I feed-3SG him
'I am feeding him.' (Lee 1975: 61)

How to account for this change in terms of a PoP account? Chomsky (2016) assumes a Root Phrase, which is comparable to a VP in earlier work, whose head R merges with an object, as in (a) of figure 2.2. Unlike the subject in (5) and (6), an object need not move to the Spec of the RP because either R[3] can label RP. However, v* can also

[3] Chomsky (2016: 4) says, 'the question turns on whether R is analogous to "weak" T . . . If it is, then object-raising is obligatory'.

transfer features to R and then the label is <phi,phi>. The latter might result in a reanalysis of the DP object as agreement in (b) of figure 2.2 because of the ambiguity of the object pronoun.

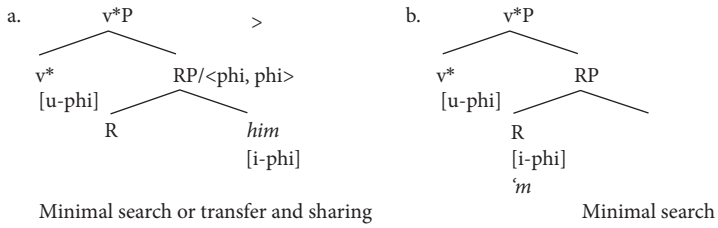


FIGURE 2.2 Reanalysis of the object resulting in simpler labelling

The renewal in stage (19d) is, as in the case of subject renewal, not due to the economy of Minimal Search. I will discuss this in section 2.4.

In connection to the subject cycle, I mentioned Greenberg's Universal 33. This universal holds for objects as well (as noted by Kayne 1989). In English, there is no movement of the object to an OV position but in some languages (e.g. French object clitics, Hopi DPs), this movement results in full agreement on the verb. A labelling approach would have to say that transfer does not take place from v* to R. This too remains for further study.

In this section, I have discussed two cases of pronouns being reanalysed as agreement markers. These can be seen as a preference for minimal search over feature-sharing.

2.4 Demonstrative pronouns

Demonstrative pronouns reduce features in a number of ways. They can lose deictic marking to become articles or complementizers and frequently reanalyse as copulas. Owing to space restrictions, I will not provide a lot of examples but focus on the mechanisms.

I will start with the reanalysis of a demonstrative to article, a change that occurred in Romance (Harris 1977, 1978), Uto-Aztecan, Salish, Egyptian, and many more (van Gelderen 2011; 2013a). In one chronicle that was written during the eleventh and twelfth centuries around Peterborough in England, the switch is very obvious. In (25), from 1130, demonstratives are used regularly (e.g. *se* is masculine singular nominative) and no articles are but, in (26), from 1137 and from a different scribe, articles suddenly appear.

(25) **Ðes** feorðe dæges þæræfter wæs **se** king Heanri on Roueceastre. & **se** burch forbernde ælmæst. & **se** ærcebiscop Willelm halgede Sancti Andreas

mynstre & **ða** forsprecon biscop mid him. & **se** kyng Heanri ferde ouer sæ into Normandi on heruest.

'On that fourth day thereafter, (that) King Henry was in Rochester, when that town was almost consumed by fire; and (that) Archbishop William consecrated St. Andrew's monastery, and those aforesaid bishops with him. And (that) King Henry went over sea into Normandy in autumn.'

(*Peterborough Chronicle*, 1130, Thorpe edition)

(26) ðis gære for **þe** king Stephne ofer sæ to Normandi & ther wes underfangen forþi ðæt hi uuenden ðæt he sculde ben alsuic alse **the** eom wes.

'This year, (the) King Stephen crossed the sea to go to Normandy and was received there because they thought he was like the uncle (i.e. his uncle).'

(*Peterborough Chronicle*, 1137, Thorpe edition)

A possible reanalysis is given in figure 2.3, where the label in (a) is seen as harder to arrive at than the one in (b), which is therefore preferred. Stage (a) is what we call concord and stage (b) involves agreement.

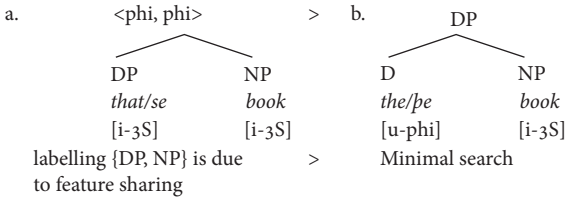


FIGURE 2.3 Reanalysis of the demonstrative as article

Another change involving the neuter demonstrative *þat* is to complementizer, as from (27a) to (27b). It could be represented as in figure 2.4, very similar to the change to article.

(27) a. mid al **þat** **þe** þeron stant
with all DEM REL thereon stands
'with all that stands thereon' (DOE, Will of Bishop Theodred, 15)

b. and suggeð feole þinges … **þat** næuere nes iwurðen
and say many things REL never NEG.was happened
'and say many things that never happened.'

(Layamon, Caligula 11472–3, Brook & Leslie edition)

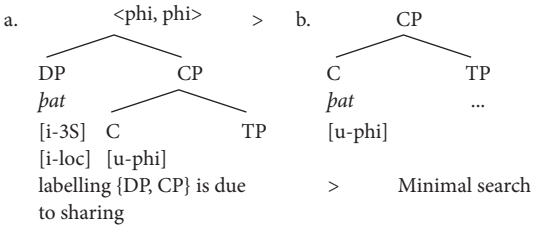


FIGURE 2.4 Reanalysis of the demonstrative as complementizer

Reanalysis of demonstratives as copulas is widely attested in Semitic, Egyptian, various creole languages, Iranian, Slavic, Tibeto-Burman, Swahili, Indonesian, Zoque, Passamaquoddy, Maya, and Chinese (van Gelderen 2015b). An example from Egyptian is given in (28) where *pw* is a masculine singular proximal demonstrative in (28a) reanalysed as (non-agreeing) copula in (28b).

(28) a. rmt **pw** (Old Egyptian)
man MSG.PROX
'This man' or 'this is a man'.

b. tmj-t **pw** jmn-t (Middle Egyptian)
city-F be west-F
'The West is a city.' (Loprieno 1995: 68)

In (29), the derivation of a DP with its (copula-lacking) predicate is given. First, the DP and AP merge, as in (29a), which results in a labelling paradox. This is resolved after the Pred head[4] is merged in (29b) and the DP moves internally. This, however, results in another unlabellable phrase. To resolve this, we would have to merge T to (29c) and apply internal merge again to the DP, as in (29d).

(29) a. {DP, AP} External Merge
b. {Pred, {DP, AP}} Merge of copula
c. {DP, {Pred, {~~DP~~, AP}}} Internal Merge of DP: unlabellable result
d. {DP, {T, {~~DP~~, {Pred, {~~DP~~, AP}}}}} Merge of T and Internal Merge of DP

Anti-locality has been defined as 'movement that cannot be too local' (Grohmann 2003: 26) and a reasonable domain of locality would be the phases PredP (or v*P) and CP. Stage (29c) is therefore ruled out, just like movement of sister of V (the object) to specifier of v*P (subject) is. This is why a reanalysis as head takes place, as shown in figure 2.5. Unlike the other cases, features are not involved.

[4] Instead of Pred, I could have used little v as well; that choice is irrelevant to the analysis.

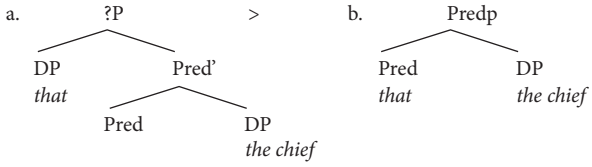


FIGURE 2.5 Reanalysis of demonstrative to copula

In short, in this section, we have seen three instances where a demonstrative is reanalysed in such a way as to enable labelling through simple search.

2.5 Towards C and ASP

In 2.5.1, I discuss two instances where a phrase continues as the specifier of the CP and does not reanalyse as the head of C. These are interesting in that their label is feature-based but very stable, unlike the ones for subject discussed in 2.1. In 2.5.2, the change from adverb to aspectual affix is discussed. This occurs in many languages and will be exemplified through Modern English which shows an incipient stage.

2.5.1 Towards the specifier of CP

In the PoP-framework, *wh*-elements in the specifier of the CP share features with the C, as shown in (9) above, and escape the Labeling Paradox that way. The verb *wonder* in (30) requires a CP that has a Q-feature. I have marked this requirement by an uninterpretable feature on the verb in (31).

(30) I wonder whether he'll do it.

(31) I wonder α[whether [C [he'll do it]]].
[u-Q] [i-Q] [~~u-Q: Q~~]

Whether has interpretable Q features which value the C. The label of α is then <Q, Q>. This label seems to be stable, unlike the <phi, phi> features of section 2.3, because *whether* is not being reanalysed as a head. (32) shows that *whether* is a specifier because extraction is not possible and, in (33), *if* occupies the head C.

(32) *Who do I wonder whether he saw ~~who~~.

(33) the Congressmen who come in in January and asking **whether if** one kind of affects the other. (COCA Spoken 2010)

There is another complementizer that checks the Q-features, namely *how,* as in (34). Here too, *how* remains in specifier position judging from sentences with the impossibility to extract in (35) and the presence of another C head, as in (36).

(34) The men will wonder **how** there'll ever be enough lobsters around this island for seven more men to … (COCA 2000 Fiction)

(35) *What will the men wonder how there'll ever be enough ~~what~~.

(36) by looking on, and watching **how that** these things might be done as well as others. (COHA 1849)

Whether and *how* have been complementizers since the Old English period (van Gelderen 2009a, 2015a) and have not changed to heads. A reviewer brings up that embedded contexts, such as (30) and (34), are more resistant to change. This cannot be the reason because both *whether* and *how* have been and are currently used as *yes/no* markers in root clauses (van Gelderen 2009a; 2015a). Even there, they show no evidence of consistently changing to C. The reason why the labelling of <Q, Q> is stable could have to do with the relevance to the semantic interface (as the same reviewer points out). Thus, <phi, phi> features are not relevant to the C-I interface but <Q, Q> features are.

2.5.2 Towards ASP

In many languages, perfective aspect goes through a cycle in which an aspectual prefix weakens and is replaced by an adverb or adposition. For instance, Lehmann (1993: 97) and Diessel (1999: 142) argue that aspectual preverbs derive from relational adverbs and adverbial demonstratives, e.g. *hin/her* in German *hinweisen* 'point out', *hinfahren* 'drive to', and *herbringen* 'bring over'. Miller (1993: 118–24) provides instances of preposition incorporation in Ancient Greek and Latin and Booij & van Marle (2003) bring together a number of studies on many languages that show a development from adverb to preverb. These cycles occur in Indo-European, but also in the Amazonian language Nadëb, as described by Weir (1986), in Athabaskan languages such as Dëne Sųłiné/ Chipewyan, as described by Li (1967), and in the Uto-Aztecan Tohono O'odham.

Old and Middle English follow Germanic in having separable and inseparable prefixes on verbs to express aspectual nuances, as in (37), as well as particles, as in (38).

(37) leofes mannes lic eall **for**swealg.
dear man's body all up.swallowed
'He swallowed up the entire body.' (*Beowulf* 2080)

(38) & **duste** him **dun** riht to þer eorðe
and threw him down right to the ground
'and threw him right down to the ground'.
(Elenbaas 2007: 219, St. Margarete 74.308)

Elenbaas (2007: ch. 4) argues that the particle in (38) is phrasal in nature and that that situation continues into Middle English because the particles are modified, coordinated, and preposable. There are particles that seem to combine with the verb, as in (39), from (late) Old English on.

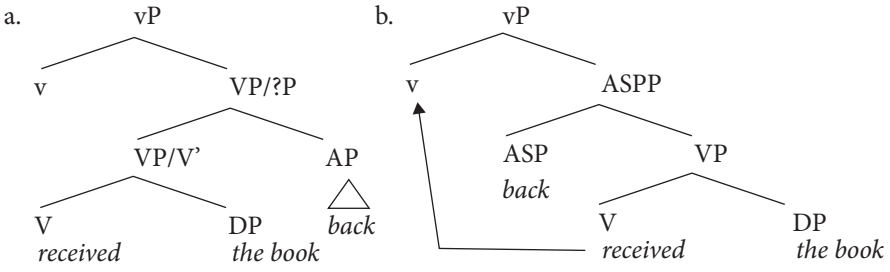
(39) til he aiauen **up** here castles
'till they gave up their castles' (*Peterborough Chronicle* 1140, 52)

The two possibilities, (38) and (39), continue in Modern English, as in (40a) and (40b). The adverb *back* is a phrase in (40a) because it can be modified by a degree adverb, which it cannot in (40b).

(40) a. They received the book right back.
b. They received (*right) back the book.

Trees for these are provided in (41a, b) respectively.

(41)



The VP/?P in (41a) is problematic for the Labelling Algorithm because it consists of two merged XPs (by pair-merge). The reanalysis of the AP as a perfective ASP head, as in (41b), is therefore expected. The two structures are shown in figure 2.6, as in Chomsky (2016), namely with R rather than V.

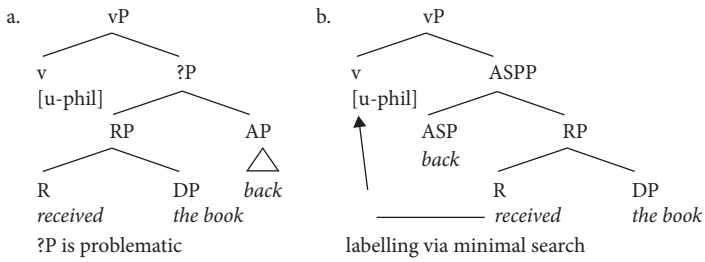


FIGURE 2.6 Reanalysis of an AP as ASP head

If (39) and (40b) are more economical from a labelling point of view, why do we still have (40a)? It may be that, in order to go from adverbial to functional category, the category has to be salient in the language which perfective is not in Modern English.

Concluding section 2.5, we have seen two cases that resist reanalysis from phrase to head and that may be due to the kinds of features that are shared in the case of Q-features. We have also seen a case where reanalysis is expected and occurs but where the change is not fast in Modern English.

2.6 Towards argumenthood

In this section, adjuncts are shown to be frequently incorporated as arguments, e.g. in (11d) and (19d), and this shows a preference of set-merge over pair-merge. I will first briefly discuss pair-merge and then show some examples of the change.

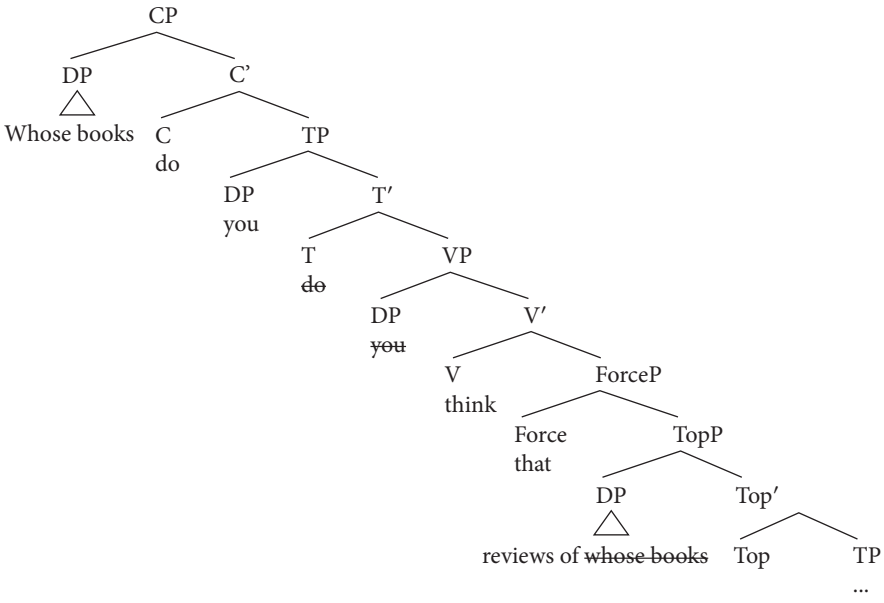
Chomsky (2000: 133; 2001) comes up with the term 'pair-merge' to describe adjunction. Merge comes in two kinds: ordered in pair-merge and unordered in set-merge. Chomsky (2004: 118–19) argues that adjuncts are invisible to normal operations: elements that c-command the pair-merged <a, {b,c}> continue to c-command the set-merged {b,c} but ignore the adjoined element. Pair-merge is invoked for adverbials because they are less integrated into a clause, evidenced by the fact that they are islands for extraction,[5] as (42) shows (and argued in Huang 1982), and impervious to c-command (as shown in Lebeaux 1991).

(42) *What did he leave the house [because she sang ~~what~~].

Topicalized DPs are also islands, as (43) shows, although one might not think they are in adjoined positions since the work by Rizzi (1997). Rizzi assigns topicalized elements to designated specifier positions in the left periphery, i.e. the TopP, as the tree in (44) shows.

(43) *Whose books do you think that [reviews of ~~whose books~~] John never reads ~~reviews of whose books~~? (adapted from Corver 2017)

(44)



[5] There are some non-finite adverbials that allow extraction (*What did John arrive whistling*), as Truswell (2007) has shown (William Kruger p.c.).

So, even if topics have designated positions, like adverbials, they are not as integrated in the sentence structure as subjects and objects are.

From a diachronic perspective, adjunct clauses have become incorporated as arguments (Hale 1976; Kiparsky 1995) and this may show a preference of set-merge over pair-merge. In what follows, I look at the change of a topic from Spec TopP to a grammatical subject in Spec TP. Van Gelderen (2008) argues that there is a principle that incorporates (innovative) topics and adverbials in the syntactic tree, as in (45a), which could be modernized in PoP terms, as in (45b).

(45) **Specifier Incorporation (SIP)**
   a. When possible, be a specifier rather than an adjunct (van Gelderen 2008: 250), or
   b. When possible, set-merge is preferred over pair-merge (even if feature-sharing with a sister XP is involved).

Givón (1979) and others have talked about topics that are later reanalysed as subjects and call this a shift from the pragmatic to the syntactic. Earlier, we saw French pronoun subjects reanalysing as agreement affixes and a new topic/subject appearing.

(46) **Moi**, j'ai froid. (Colloquial French)
me 1SG.have cold
'I am cold.'

Is there evidence of a renewal of the topic *moi* in (46) as subject? The answer is yes. Various researchers have commented on colloquial forms where the DP is an indefinite or quantifier, as in (47) to (49), and these cannot be topics and are therefore seen as having been reanalysed, as well as (14) and (16).

(47) si un: un Russe i va en france (Swiss Spoken French)
if a a Russian 3SGM goes to France
'If a Russian goes to France.' (Fonseca-Greber 2000: 335, repeated from (15))

(48) Chaque femme elle parle (Pied Noir French)
Every woman 3SGF talks
'Every woman talks.' (Roberge 1990: 97)

(49) Un Cadien ça travaillait pas. (Acadian French)
An Acadian 3 works not
'An Acadien doesn't work.' (Girard 2010: 2010)

The change from topic to subject is represented in figure 2.7.

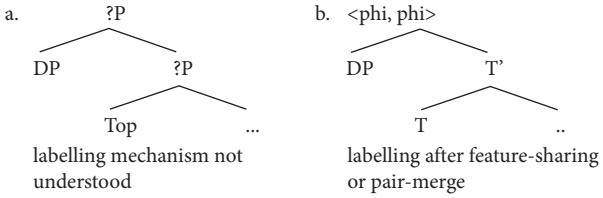


FIGURE 2.7 From topic to subject

The last stage of the object cycle in (19) involves the renewal of the object through the incorporation of a topic that is right-dislocated. The actual reanalysis depends too much on which model of right-dislocation one follows and I will leave it aside.

In this section, I have looked at the renewal of the subject through a topic and suggested a preference of set-merge over pair-merge, which is selected by the language learner once the data are ambiguous, as in (46).

2.7 Conclusion

In this chapter, I have argued that the Labelling Algorithm motivates the reanalyses involved in the linguistic cycle. Minimalism, PoP included, constitutes a paradigm shift in attributing as little as possible to Universal Grammar and that includes labelling. Merge is forced by interface conditions that require labelling. In the change from specifier to head, we see one solution to the labelling problem: change from feature-sharing and agree to minimal search. The cases of specifier to head change that I have selected range from frequent to less frequent. I have done this on purpose to determine some other factors involved, e.g. the difference between <Q,Q> and <phi,phi> sharing, the one relevant to the C-I Interface and the other not..

Subject and object cycles are clear examples of the change from phrasal pronoun to agreement head. The changes involving demonstratives to articles and complementizers also involve phrase to head reanalysis that shows a preference for minimal search. In the case of reanalysis to copula, another constraint is at work, namely anti-locality. The *wh*-elements *whether* and *how* are specifiers and show no reanalysis to head, which shows that this feature-sharing is stable. Finally, the change from AP to ASP head is frequent in a number of languages but not in English. The changes involving the renewal of the subject pronoun show the preference of set-merge over pair-merge.

(50) summarizes the preferences.

(50) minimal search > feature sharing <phi,phi> > pair-merge

Acknowledgements

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