

Dissertation title: Grammaticalization and 'lateral' grammaticalization: a new perspective on linguistic interfaces and functional categories

Introduction:

Simpson and Wu (S&W) (2002a) and Wu (2004:chapter 4) propose a new type of grammaticalization called 'lateral' grammaticalization (LG) within the Minimalist framework. They analyse Chinese cleft sentences, which display the following alternations:

- |     |    |     |           |     |        |        |
|-----|----|-----|-----------|-----|--------|--------|
| 1a) | wo | shi | zuotian   | mai | piao   | de     |
|     | I  | BE  | yesterday | buy | ticket | DE     |
| 1b) | wo | shi | zuotian   | mai | de     | piao   |
|     | I  | BE  | yesterday | buy | DE     | ticket |

'It was yesterday that I bought the ticket.' (S&W (2002a:169), Wu (2004:120))

As S&W (2002a:186-190) and Wu (2004:138-141) analyse sentence-final *de* (ex. 1a)) as a determiner (D) and verbal suffix *-de* (e.g. *mai-de* in ex. 1b)) as a past tense marker (T(past)), they define LG as a change where one functional category (e.g. D) is 'laterally' re-analysed as another (e.g. T) (S&W (2002a:198-202), Wu (2004:149-153)).<sup>1</sup> In Tse (2011, 2013a, b), I compare LG with Roberts & Roussou (R&R) (2003) and van Gelderen's (2004a, 2011a) Minimalist analyses of grammaticalization (henceforth 'standard' grammaticalization (SG)) and argue that while LG displays R&R and van Gelderen's 'structural simplification' (Tse (2011:section 3, 2013a:96-110, 2013b:99-105)), it does not display R&R's 'upward feature analysis' (Tse (2011:sections 3.5-3.6, 4.4, 2013a:112-113, 2013b:99-105)), which is a diagnostic trait of SG (R&R (2003:200)). Furthermore, while SG regularly displays weakening in phonology ('phonological weakening'), morphology ('univerbation') and semantics ('semantic bleaching') (R&R (2003:218-229)), LG does not (Tse (2011:sections 3.3-3.6, 4.2-4.4, 2013a:110-113, 2013b:106-107)). It is hence concluded that weakening in grammaticalization is caused by 'upward feature analysis', which occurs in SG but not in LG (Tse (2011:sections 4.2-4.4, 2013a:112-113, 2013b:106-107)).

These conclusions are significant, since it is widely noted that functional elements tend to be morphophonologically and semantically weak (Takeshi (1971:2-6), Abney (1987:64-65), Selkirk (1995:1-2, 1996:187-188, 2004:464-465), Muysken (2008:39-41)).<sup>2</sup> Similarly, weakening is so

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<sup>1</sup> This is neatly summed up as follows:

'Syntactically, such D-to-T conversion is suggested to be an example of 'lateral grammaticalization', a process in which a functional head from one type of syntactic domain may under appropriate circumstances undergo re-interpretation as an equivalent functional head in a second domain, D and T here both being elements which (potentially) assign deictic reference to their complements and therefore having largely corresponding function in the nominal and clausal domains' (original brackets) (S&W (2002a:170), Wu (2004:121)).

'This additional route of categorial reanalysis does not result from any movement and reanalysis within a single lexical-functional domain, but instead critically involves the reanalysis of a functional category from one lexical-functional domain to a functional head in a discrete second type of domain, a kind of 'lateral' *cross-domain* reanalysis/grammaticalization' (original italics and brackets) (S&W (2002a:201-202), Wu (2004:152)).

<sup>2</sup> This leads to R&R's (2003:229-232) 'Interface Defectivity Hypothesis' (IDH), which assumes that functional elements are necessarily defective at the interfaces and that when lexical categories are re-analysed as functional in grammaticalization, they necessarily undergo morphophonological and semantic weakening (cf

common in grammaticalization that it is assumed to be a diagnostic feature (Heine and Reh (1984:15ff, 67), Lehmann (1985:305-310, 1986:1-3, 1995:chapter 4, 2004:157), Heine (2002:84, 2003:578-579), Heine and Kuteva (2002:2, 2005:15, 80)). The evidence from LG, however, suggests that not only are functional elements not necessarily weak, their empirical properties can (and should) be derived from independent principles of grammar rather than be assumed *a priori* (see footnote 2). The most influential explanation for weakening in grammaticalization is Bybee's (2003a, 2011) theory of frequency. However, as Bybee does not take into account the relative and differing frequency and weakening effects of grammaticalization, her theory cannot account for the lack of weakening in LG either (Tse (2011:section 5.2)). It remains to be explored whether the formal differences between SG and LG entail differences in frequency which can account for their empirical differences. In this dissertation, there are three interrelated research aims: 1) to derive the empirical properties of functional categories from grammaticalization, as grammaticalization is the process which creates functional elements<sup>3</sup> 2) to propose new mechanisms of syntax-related interface which can account for the weakening (and lack thereof) of functional elements in grammaticalization 3) to establish LG as a unique sub-type of grammaticalization which does not entail weakening to the grammaticalizing element.<sup>4</sup> In order to achieve these aims, this dissertation will consist of six chapters:

- 1) a formal comparison between SG and LG within the Minimalist framework, as proposed by R&R (2003), Roberts (2010, 2012), S&W (2002a), van Gelderen (2004a, 2009d, 2011a, b) and Wu (2004)
- 2) an analysis of the differences between SG and LG in light of Bybee's (2003a) model of frequency and a proposal of a new model of syntax-phonology interface called 'Functional Spell-Out'
- 3) a comparison between two case studies of SG and LG, namely the grammaticalization of Latin *habere* as the Romance future tense marker (V > Mod > T(future)) (SG) and the grammaticalization of Chinese copula *shi* (D > T) (LG), since both produce T elements (cf ex. 1a-b))
- 4) a cross-linguistic analysis of the typological patterns of weakening in my case studies, namely V 'to have' > Mod, Mod > T(future) and D > T (copula verb)

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R&R (1999:1012-1013)). Similar assumptions are made in Prosodic Phonology, namely Selkirk's 'Principle of Categorical Invisibility of Functional Words' (PCI), which states that functional categories are invisible to phonological rules and are hence necessarily subsumed within the prosodic domains of neighbouring lexical words (Selkirk (1984:335-337), cf Selkirk et al. (1987, 1990), Truckenbrodt (1995, 1999)). These assumptions are problematic, not only due to the lack of weakening in LG, but also because they have no explanatory value whatsoever (cf Elordietta (2007:139, 2008:247)).

<sup>3</sup> This is indeed one of the main research goals in R&R (2003) (R&R (2003:2-5, 218-234)) (cf previous footnote).

<sup>4</sup> One might argue that LG is not grammaticalization (SG) at all, since it does not have the same empirical effects, namely weakening to the grammaticalizing element (I am grateful to Dr George Tsoulas for this). However, as grammaticalization has been minimally defined as the creation of functional categories (Campbell and Janda (2001:107)), LG should be classified as grammaticalization, since it does produce functional (T) elements (see ex. 1)). Furthermore, as weakening in grammaticalization has been argued to be probabilistic and is hence neither a sufficient nor a necessary criterion for grammaticalization (Campbell (2001:118-122)), the lack of weakening in LG is not a strong reason for separating it from grammaticalization. Moreover, as LG does seem to conform to R&R and van Gelderen's 'structural simplification' (Tse (2011:section 5.1, 2013a:113)), it should be subsumed within the same type of formal syntactic change as SG, namely grammaticalization.

5) an analysis of the diachronic frequencies of the grammaticalizing elements in my case studies, namely Latin *habere* + infinitive as the Romance future (SG) and Chinese copula *shi* (LG)

6) concluding remarks, where an explanatory account for weakening (and lack thereof) in grammaticalization will be given in the form of the correlation between the diachronic frequencies of the grammaticalizing elements and their morphophonological weakening in SG and LG

Through this dissertation, I hope to demonstrate the explanatory power of diachronic syntax by analysing two types of grammaticalization (SG/LG) whose similarities and differences can be used to account for some very important issues in synchronic linguistics, namely the empirical properties of functional categories and the mechanisms of syntax-phonology interface which underlie them. Furthermore, I hope to show that Minimalism is indeed an elegant model for analysing syntactic change, since it successfully distinguishes two types of grammaticalization (SG/LG) whose formal differences do seem to account for their empirical differences (cf Tse (2011:section 5.1, 2013a:113)).

## Chapter 1: Grammaticalization: a formal account:

Formal analyses of grammaticalization argue that grammaticalization is a form of ‘structural simplification’ which occurs cross-linguistically because ‘simpler’ structures are favoured in language acquisition and change (R&R (2003:2-8), van Gelderen (2011a:3-30), cf Clark and Roberts (1993:315-316)).<sup>5</sup> In this chapter, I introduce the definitions of ‘simplicity’ and ‘structural simplification’ which are argued to underlie grammaticalization and compare SG and LG within the Minimalist framework.

### Section 1.1: ‘standard’ grammaticalization (SG):

R&R (2003:200-202) define ‘simplicity’ as the reduction of ‘feature syncretisms’ as they argue that ‘structural simplification’ in grammaticalization involves the elimination of *Move* and *Agree* in favour of *Merge*, as exemplified by the following schemata (R&R (2003:198-199)):<sup>6</sup>

- 1)  $[_{XP} Y+X [_{YP...t_Y...}]] > [_{XP} Y=X [_{YP...Y...}]]$
- 2)  $[_{XP} X_F... [_{YP...Y_F...}]] > [_{XP} X_F... [_{YP...Y...}]]$
- 3)  $[_{X_{8P}} YP X ... [ ... t_{YP} ... ]] > [_{XP} Y=X ... [ ... ]]$ <sup>7</sup>

<sup>5</sup> It is traditionally assumed that language change occurs in language acquisition where children acquire a different grammar from that of the previous generation (Hale (1998:2-3, 8ff), Kroch (2001:699-703, 708ff), Roberts (2007:chapter 3), cf Niyogi and Berwick (1995, 1996, 1997)). Furthermore, generative models of language acquisition assume an innate component of language (Universal Grammar (UG)) which interacts with the child’s linguistic environment (Primary Linguistic Data (PLD)) in setting the parameter values of the universal principles of grammar (Chomsky (1986a:24ff, 1993:1-4, 1995:14-15, 167-170, 219), Lightfoot (1991:1-10, 1999:49-68, 2006:9-12), cf Hyams (1986), Guasti (2002), Niyogi (2006)). Language change, therefore, consists of parameter resettings in language acquisition (Clark and Roberts (1993:300), Lightfoot (1991:157-173, 1997:174-176, 1999:77-91, 105-108, 178ff), Roberts (2007:226ff)). In recent Minimalism, factors that are independent of language (Third Factor Principles (III)) are also argued to play a role in language acquisition (Chomsky (2004:105, 2005:6, 2007:3, 2008:133, 2013:37)), and these are argued to include the child’s preference for ‘simpler’ structures (van Gelderen (2008b:200, 2009b:133, 2011a:9), Roberts and Holmberg (2010:50-54), cf Chomsky (2005:6, 9, 2007:3, 9, 2013:37)). Language acquisition and change, therefore, can be schematised thus:

- |            |            |                            |        |           |
|------------|------------|----------------------------|--------|-----------|
| 1) Trigger | + genotype | + extra-linguistic factors | —————> | phenotype |
| 2) PLD     | + UG       | + III                      | —————> | Grammar   |

(cf Lightfoot (1989:321, 1991:1, 1999:66-67, 2006:10, 45), Lightfoot and Anderson (2002:162))

As it is previously assumed that language evolution is random (Roberts (1993a:252), Battye and Roberts (1995:11), cf Lightfoot (1999:chapters 5-6, 2006:87ff)), this preference for ‘simpler’ structures accounts for the cross-linguistic distribution of grammaticalization (see e.g. Heine and Kuteva (2002)), since grammaticalization is argued to be a natural mechanism in language acquisition and change which creates ‘basins of attraction’ within the parametric space (R&R (2003:2-8, 209-218), cf Roberts (2001:91ff)).

<sup>6</sup> This is summed up as follows:

‘Feature syncretisms can be defined as the presence of more than one formal feature in a given structural position: H [+F, +G...]. Thus the structure with the least occurrences of multiple features on single positions is the simplest. Structural simplification should be understood in terms of PF realization of these features, so a lexical item which realizes X and Y (two syntactic projections i.e. *Move/Agree*) is more complex than one which realizes X (one syntactic projection i.e. *Merge*) only.’ (my brackets) (R&R (2003:201)).

<sup>7</sup> R&R (2003:12-15) assume a cue-based model of language acquisition where ‘cues’ are fragments of sentences which express parameter values (cf Clark and Roberts (1993:317-318), Gibson and Wexler (1994:407-410), Lightfoot (1997:176-189, 1999:144-167, 2006:77-86), Fodor (1998:4ff, 2001:736ff), Dresher (1999:28-29)). In order to bring about parameter resettings (see footnote 5), there need to be structurally ambiguous ‘cues’ which can yield alternative parameter expressions and re-analysis (Clark and Roberts (1993:302, 318-319, 325), Lightfoot (1997:176-185, 1999:77-79, 87-91, 105-108), Roberts (2007:132-133), cf Langacker (1977:58), Timberlake (1977:141-151), Harris and Campbell (1995:50, 61, 70ff)). As parameters are

In 1) and 3), *Move* ( $Y+X \dots t_v, YP X \dots t_{vp}$ ) is lost and the grammaticalizing element ( $Y$ ) is shifted upwards from its original base position ( $t_v, t_{vp}$ ) to a higher functional head via *Merge* ( $Y=X$ ),<sup>8</sup> while in 2), *Agree* ( $X_F \dots Y_F$ ) is lost and the grammaticalized element is shifted to a functional head via *Merge* ( $X_F$ ).<sup>9</sup> In all three types, syntactic dependencies (*Move/Agree*) are lost and the grammaticalizing element is shifted to its respective functional head (*Merge*).<sup>10</sup> R&R (2003:209-213), therefore, posit the following cline of parametric markedness which underlies grammaticalization (cf Gianollo, Guardiano and Longobardi (2008:119), Roberts and Holmberg (2010:45-46)):

$$4) F^*_{\text{Move/Move}} > F^*_{\text{MoveXP/Merge}} > F^*_{\text{MoveX/Merge}} > F^*_{\text{MoveXP}} > F^*_{\text{MoveX}} > F^*_{\text{Agree}} > F^*_{\text{Merge}} > F^{11\ 12}$$

currently assumed to be associated with particular lexical items, namely functional categories (Biberauer (2008:23ff), Roberts and Holmberg (2010:32ff), cf Borer (1984), Fukui (1986), Ouhalla (1991), Chomsky (1995), Kayne (2005)), syntactic change can be analysed in terms of changes in functional categories (Roberts (2001:107-123, 2007:chapters 1-2), cf Longobardi (2003)).

<sup>8</sup> Cf van Gelderen's Late Merge Principle (LMP) and Head Preference Principle (HPP):

- i) 'Merge as late (i.e. high) as possible' (LMP)  
(my brackets) (van Gelderen (2004a:12, 28, 2004b:61)), cf S&W (2002b:291-292))
- ii) 'Be a head, rather than a phrase (i.e. specifier)' (HPP)  
(my brackets) (van Gelderen (2004a:11, 2004b:61), cf S&W (2002b:308))

LMP applies to exs. 1) and 3) (higher *Merge*) while HPP applies to 3) (Specifier > Head).

<sup>9</sup> Interestingly, examples of 2) involve the grammaticalizing element being shifted downwards to a lower functional head e.g. Greek  $\iota\alpha > \nu\alpha$  ( $C > M$ ) and Latin *modo ut* > Calabrian *mu* ( $C > M$ ) (R&R (2003:73-97), cf Rizzi (1997:288) who argues that  $M (=Fin)$  is lower than  $C (=Force)$ ). Although R&R (2003:199) maintain that there is an upward shift of subjunctive features from the verb ( $T$ ) to the mood particles ( $M$ ) themselves, it remains the case that these grammaticalizing elements are shifted downwards in the functional hierarchy of  $C$  elements ( $C > M$ ). In Tse (2012:section 3, 2014), I similarly argue that prepositional case-markers are shifted downwards in the functional hierarchy of prepositions ( $P > K$ ) due to loss of *Agree* (cf Cinque and Rizzi (2010:*passim*) who argue that  $K$  is lower than  $P$ ).

<sup>10</sup> As Chomsky (2000:101, 2001:3-5, 2004:114) argues that *Agree* and *Move* consist of probe-goal relations and feature-checking, R&R's analysis can be further generalised as the loss of probe features and the shift of the grammaticalizing element to the goal features in its respective functional head (cf Roberts (2010:50-51, 2012:353-354)), which can be either 'upwards' in the loss of *Move* or 'downwards' in the loss of *Agree* (see previous footnote, cf Zeijlstra (2012)). R&R (1998:1-7, 1999:1015-1017, 2002:24-27, 2003:27-34) and Roberts (2001:97-100) reject feature-checking and dispense with uninterpretable (i.e. probe) features in their account, but this is problematic, since their definition of 'feature syncretisms' (see footnote 6) entails that lexical items enter the derivation with interpretable formal features (i.e. fully inflected) (R&R (2003:200-201)), which is a lexicalist approach (cf Chomsky (1993:27-32, 1995:195-200)), but their argument that grammaticalizing (i.e. functional) elements are merged in functional heads is an anti-lexicalist approach (Cinque (2001a:6), cf Halle and Marantz (1993)). In my analysis, I retain the use of uninterpretable features and feature-checking in deriving *Move/Agree*, the loss of which can be attributed to the loss of uninterpretable features, which still conforms to R&R's reduction of 'feature syncretisms' (see footnote 6, cf Roberts (2010:49-51, 2012:352-354)). Parametric variation, therefore, can be defined by uninterpretable features associated with functional heads (see footnote 7, cf Collins (2005:117)).

<sup>11</sup> The asterisk indicates that the functional head requires phonological material at Spell-Out (R&R (1999:1017-1018, 2003:29)), and since R&R (2003:17-27) assume that functional categories project syntactically (cf Chomsky (1986b, 1995), Ouhalla (1991)), functional categories are open to syntactic operations (*Merge*, *Move*, *Agree*) which define parametric variation (R&R (2003:17-33)).

<sup>12</sup> Although *Merge* (External Merge) is no longer considered 'simpler' than *Move* (Internal Merge) (Chomsky (2004 *et seq.*), *pace* Chomsky (1991, 1993, 1995, 2000, 2001)), it is still possible to argue that  $F_{\text{Merge}}$  is 'simpler' than  $F_{\text{Move/Agree}}$ , since while  $F_{\text{Merge}}$  only merges the functional head (*Merge*),  $F_{\text{Move/Agree}}$  requires merging the functional head and its lexical complement (and any successive chain positions (Chomsky (1993:15ff, 1995:214ff, 250ff)) and establishing syntactic dependencies between them, which minimally involves merging two elements and triggering feature-checking (i.e. matching (Chomsky (2000:122, 2001:5)) between them (*Merge*, *Merge*, *Match*) while  $F_{\text{Move}}$  also involves moving the element, creating copies of it and deleting those

Van Gelderen (2008a, 2009a, 2011a) further proposes 'Feature Economy', which states that uninterpretable features are preferred to interpretable features in language acquisition and change:<sup>13</sup>

5) Semantic features > i-F > u-F >  $\emptyset$

(van Gelderen (2008a:297, 2009a:8, 2010:145, 2011a: 17-20, 2011b:54))

According to this cline, lexical categories with interpretable features (i-F) are prone to be reanalysed as their respective functional categories with corresponding uninterpretable features (u-F) (van Gelderen (2008a:297-299, 2009a:6-8, 2011a:4, 17, 20)).<sup>14</sup> The following examples of grammaticalization are hence derived:

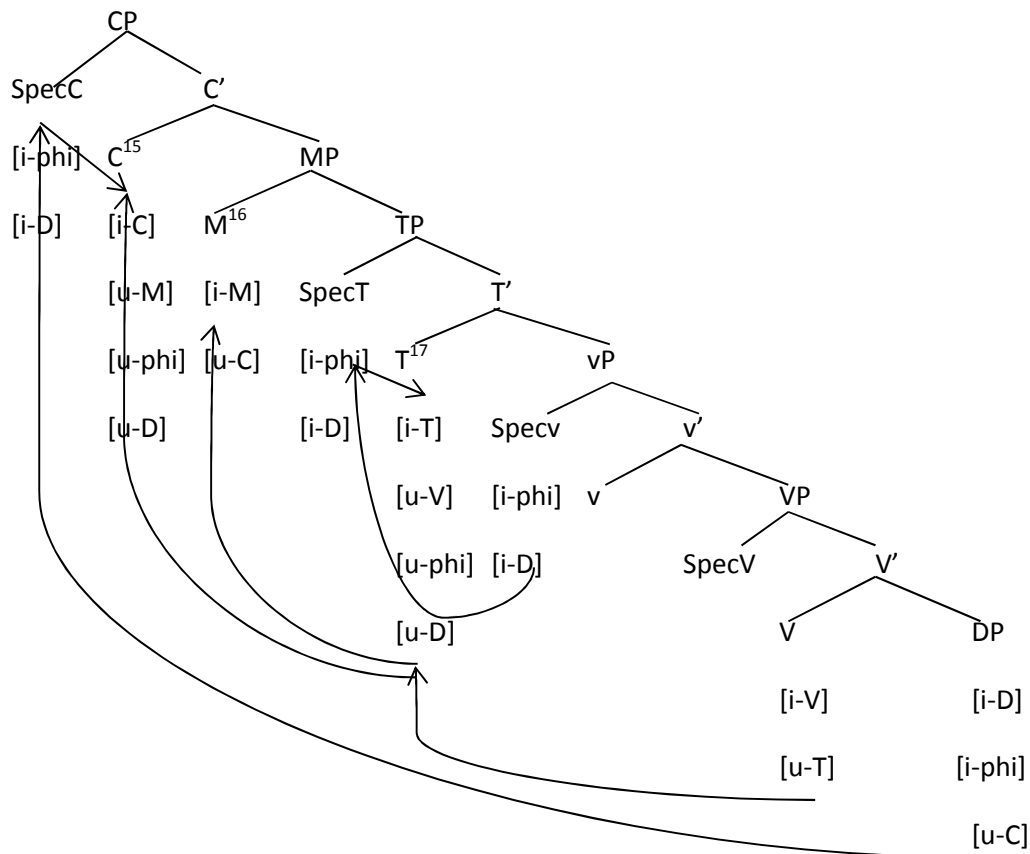
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that are not pronounced (Merge, Merge, Match, Move, Copy, Delete) (cf Chomsky (1995:249-256, 2000:101, 114, 122-123, 2001:3-10, 2004:110-111, 2005:13, 2007:10-12, 2008:140, 2012:3)), which are significantly more complex than  $F_{\text{Merge}}$  (cf van Gelderen (2008a:296, 2011a:16)).  $F_{\text{Move/Agree}} > F_{\text{Merge}}$  therefore, can be reinterpreted as the elimination of feature-checking, merger operations and feature places, which may be argued to conform to Chomsky's 'Minimize Computation' (MC), a third factor principle which eliminates copies in the derivation (Chomsky (2008:146, 2012:3, 2013:41, 2014:3)). Furthermore, an elimination of feature-places entails a reduction of lexical items in the numeration/lexical array, which reduces the load on cognitive memory (cf Chomsky (2000:100-106)). R&R's 'structural simplification' still holds under current Minimalist assumptions. More will be said about this below.

<sup>13</sup> Van Gelderen (2009a:8, 2011a:17-18)) derives 'Feature Economy' from Hicks' (2009:203-205) 'Maximize Feature Economy' and Schutze's (1997:113-114, 2009:86)) 'Accord Maximization Principle', which state that uninterpretable features should be maximised wherever possible and are reformulated as 'Minimize Interpretable/Semantic Features' (van Gelderen (2008a:297, 2009a:8, 2011a:17)). Evidence for 'Feature Economy' (i-F > u-F) in language acquisition is given in van Gelderen (2006a:2-4, 2006c:4ff, 2008a:292-293, 2011a:21-30) (cf Radford (2000)).

<sup>14</sup> Van Gelderen (2009a, 2011a) hence argues that grammaticalization is cyclic, since the grammaticalizing element (i-F > u-F) ends up probing (u-F) for its original category (i-F) (cf Givón (1971:411-412, 1979:209), Croft (1990:230)).

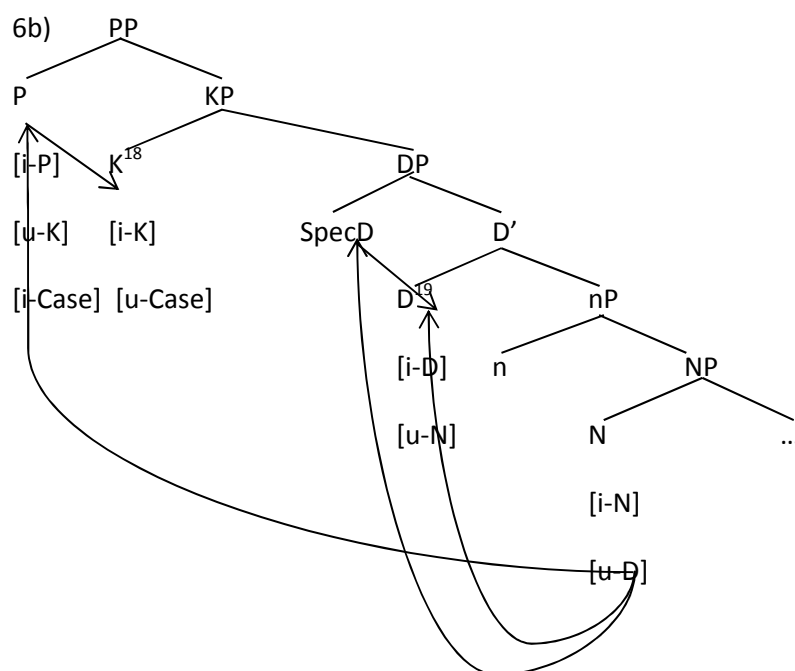
6a)



<sup>15</sup> C triggers *wh-Move* for interrogative/relative pronouns (D-to-SpecC), the loss of which leads to them being re-analysed as finite complementisers (D > C) (e.g. Germanic and Greek finite complementisers (R&R (2003:110-121), cf van Gelderen (2004a:77-99, 2004b:71-76, 2009b:139ff)). C also triggers *V-to-C Move* for lexical verbs, the loss of which leads to them being re-analysed as verbal complementisers (V > C) (e.g. African complementisers (R&R (2003:121-127)), cf van Gelderen (2004a:123, 2004b:71-78, 2009b:140ff)).

<sup>16</sup> M triggers *Agree* with complementisers (C-M), the loss of which leads to them being re-analysed as mood particles (C > M) (e.g. Greek and Calabrian mood particles (R&R (2003:74-97), cf footnote 9)). Furthermore, M may host auxiliary verbs (T > M) (e.g. Greek  $\vartheta\epsilon\lambda\omega\ \nu\alpha > \vartheta\alpha$  (R&R (2003:58-71)).

<sup>17</sup> T triggers *V-to-T Move* for lexical verbs, the loss of which leads to them being re-analysed as auxiliary verbs (V > T) (e.g. English modals (R&R (2003:36-48), cf van Gelderen (2004a:230-231)). T also triggers *Move* for external arguments (Specv > SpecT), the loss of which leads to them being re-analysed as subject agreement markers (D > T) (e.g. Northern Italian subject clitics (R&R (2003:175-192), cf van Gelderen (2011a:chapter 2, 2011c)).



In both the clausal (ex. 6a)) and nominal (ex. 6b)) hierarchies, grammaticalizing elements are shifted to their respective functional heads (see arrows), and these shifts define the cross-linguistic pathways of grammaticalization (cf R&R (2003:202), Roberts (2010:46-49, 54-65, 2012:352, 355-363)).<sup>20 21</sup> The shift of grammaticalizing elements to their respective functional heads will hence be known as ‘Functional Attraction’ (F-attraction), which is a diagnostic trait of SG.<sup>22</sup>

## Section 1.2: ‘Functional Attraction’ (F-attraction):

F-attraction in SG can hence be represented thus (cf R&R (2003:200)):

<sup>18</sup> K triggers *Agree* with lexical prepositions (P-K), the loss of which leads to them being re-analysed as case-markers (P > K) (e.g. Romance and English case-markers (Tse (2012:section 3, 2014))).

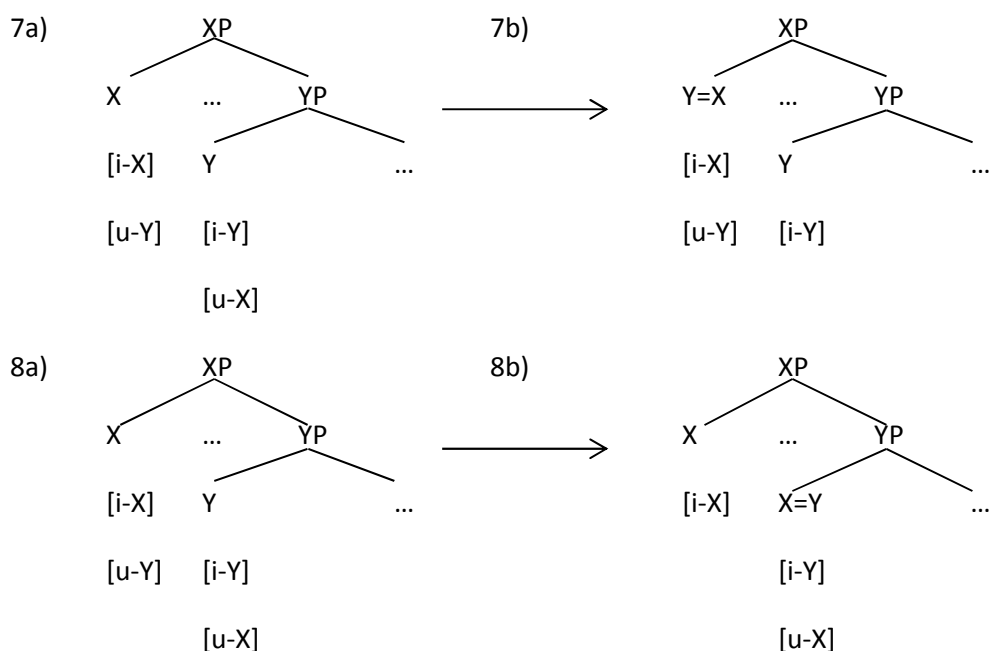
<sup>19</sup> D triggers *Move* for nouns and lower D elements (e.g. Dem > SpecD), the loss of which leads to them being re-analysed as determiners (N > D, Dem > D) (e.g. Romance and Germanic determiners (R&R (2003:131-156, 161-175), van Gelderen (2007:287ff), cf Wu (2004:chapter 1))).

<sup>20</sup> There are some striking parallels between the clausal (ex. 6a)) and nominal (ex. 6b)) hierarchies: loss of V-to-T *Move* (V > T) and loss of N-to-D *Move* (N > D) (see footnotes 17 and 19), loss of *Move* to SpecT (> T) and loss of *Move* to SpecD (> D) (see footnotes 17 and 19), loss of C-M *Agree* (C > M) and loss of P-K *Agree* (P > K) (see footnotes 16 and 18). These diachronic parallels indicate the structural similarities between the clausal and nominal domains (cf Abney (1987), Lamontagne and Travis (1987, 1992)).

<sup>21</sup> There are other examples of grammaticalization which do not easily fit into these generalised structures e.g. prepositional complementisers (P > C) (e.g. Dutch *van* (van Gelderen (2004a:30-33, 2004b:90-92))), negators (D > Neg) (e.g. French *pas* (R&R (2003:154-161), cf Roberts (2007:64-77), van Gelderen (2004b:78-87, 2008b:197ff))), all of which display upward shift due to loss of *Move*.

<sup>22</sup> There are other types of syntactic change where *Move* is lost but the formerly moved element remains *in-situ* e.g. loss of V2 (V-to-C *Move*) (Roberts (1993b)), loss of V-to-T *Move* (Roberts (1999)), OV > VO (Roberts (1997)), loss of *wh-Move* (Roberts (2007:81-92)). In these changes, there is no ‘structural simplification’ as there is no elimination of feature-checking or feature-places but a change from overt to covert *Move* (or *Move* > *Agree* (Chomsky (2000, 2001))). The empirical differences are outlined in R&R (2003:205-209), and these include morphophonological and semantic weakening, which occurs in grammaticalization and not elsewhere.





In both cases, *Move/Agree* ([u-Y], [u-X] in ex. 7a), 8a)) is lost and the grammaticalizing element (Y in ex. 7), X in ex. 8)) is shifted either upwards or downwards to its respective functional head via *Merge* (Y=X in ex. 7b), X=Y in ex. 8b)) where its originally interpretable features become uninterpretable ([i-Y] > [u-Y] in ex. 7), [i-X] > [u-X] in ex. 8)) and hence select a new complement of its original category (Y in ex. 7b), X in ex. 8b)) (cf footnote 14). ‘Structural simplification’ can be understood as the loss of syntactic dependencies (*Move/Agree*) and the elimination of merger operations and feature places which result from ‘F-attraction’ (*Merge*) (cf footnote 12). Such is R&R and van Gelderen’s Minimalist analysis of grammaticalization (SG). In the next section, I analyse LG within their assumptions.

### Section 2.1: ‘lateral’ grammaticalization (LG):

S&W (2002a) and Wu (2004) cite Chinese *de* in cleft constructions as their case-study of LG, which displays the following alternations in northern Mandarin dialects:

- 9a)    wo     shi     zuotian     mai     piao     de  
        I     be     yesterday     buy     ticket     DE
- 9b)    wo     shi     zuotian     mai     de     piao  
        I     be     yesterday     buy     DE     ticket

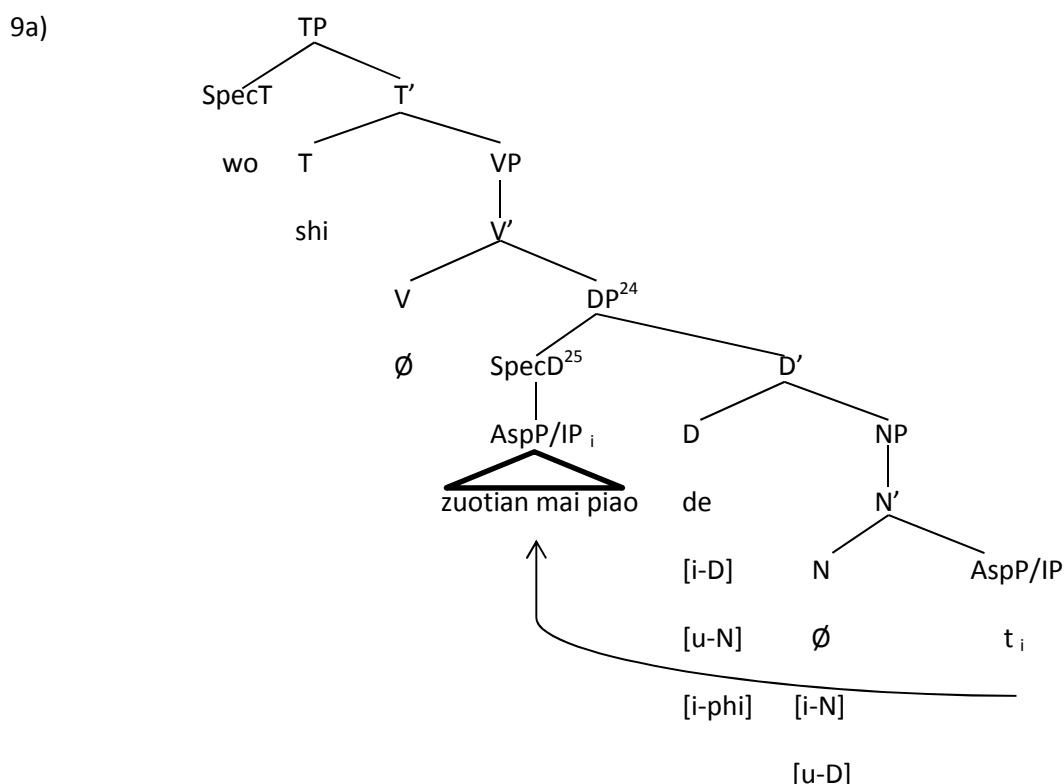
‘It was yesterday that I bought the ticket.’ (S&W (2002a:169), Wu (2004:120))<sup>23</sup>

As the word order in ex. 9a) is pan-Chinese and is attested earlier and more widely than that in ex. 9b) (S&W (2002a:171), Wu (2004:122, 130-131), cf Chao (1968:297), Paul and Whitman (2008:428)), it is argued that *de* has been preposed from sentence final position to being a verbal suffix (*zuotian mai-de<sub>i</sub> piao t<sub>i</sub>*) (S&W (2002a:173-174), Wu (2004:122-125)). In this section, I analyse *de* in Chinese cleft constructions.

<sup>23</sup> All Chinese examples in the main text are presented in their original written form in Appendix 1.

## Section 2.2: Chinese *de*:

Chinese cleft constructions consist of the copula *shi* and a predicate ending in *de* (hence *shi-de* constructions) (Chao (1968:296-298), Li and Thompson (1981:587-591)), and cleft focus is assigned to the constituent immediately after *shi* (Lee (2005a:3-4), Paul and Whitman (2008:415ff), Hole (2011:1710-1712)). S&W (2002a:179-181) and Wu (2004:132ff) analyse the predicate as a complex noun phrase (CNP) with an empty noun which explains the situation regarding the subject (e.g. *wo shi zuotian mai piao de* ∅ 'As for me, the (situation/thing) is that I bought tickets YESTERDAY' (cf Chao (1968:296), Li and Thompson (1981:587-593), Kitagawa and Ross (1982), Ross (1983)). 9a), therefore, is represented thus (S&W (2002a:186-189), Wu (2004:139-140)):



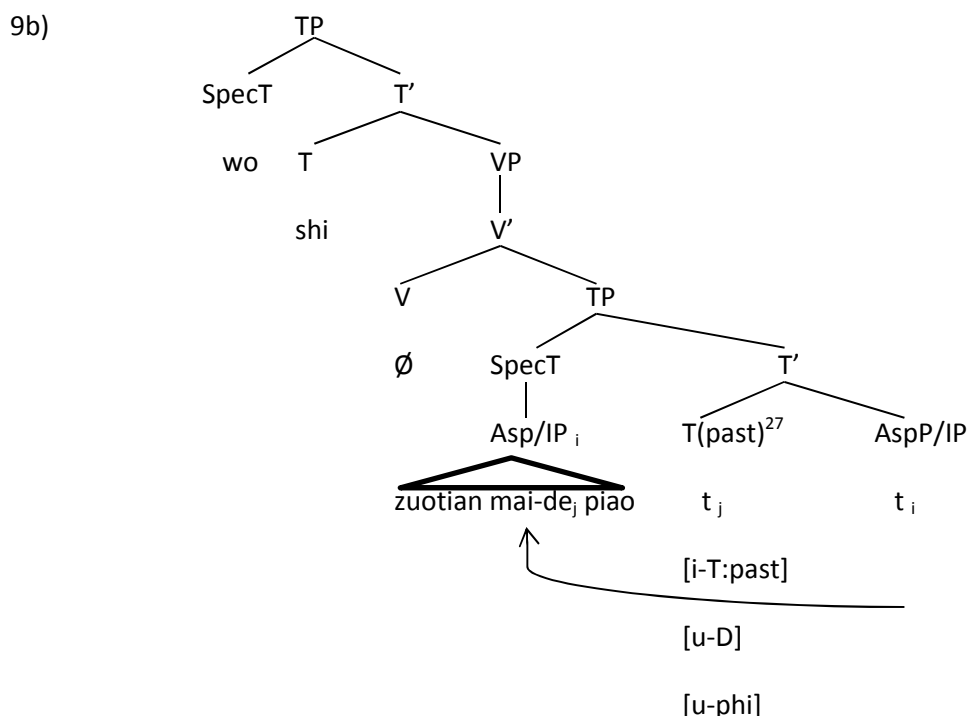
As sentence-final *de* tends to indicate past-time reference in the embedded clause,<sup>26</sup> *de* is argued to be re-analysed as a past tense marker (T(past)) and cliticise onto the verb in the relative clause (*zuotian mai-deᵢ piao tᵢ*) (S&W (2002a:173-175, 190-193), Wu (2004:123-125, 141-146)):

<sup>24</sup> S&W (2002a:185-188) and Wu (2004:138-141) analyse CNPs as relative clauses headed by *de* (D) which selects a nominal complement (NP) in which the relative clause (here *zuotian mai piao* 'pro) bought tickets yesterday') raises to SpecD (cf Simpson (2001, 2003)).

<sup>25</sup> In this analysis, it is unclear how focus is assigned to the constituent immediately after *shi* (here *zuotian* 'yesterday') (cf Hole (2011:1715)), though Wu (2004:152ff) posits LF-focus to it (cf Chiu (1993), Huang (1982), Shi (1994), Lee (2005a), Hole (2011:1716)).

<sup>26</sup> S&W (2002a:175-177) and Wu (2004:126-127) point out that when sentence-final *de* is used, the embedded clause tends to refer to past time events (cf Lee (2005a:150-152), Hole (2011:1713)):

- i)      wo   shi      gen      Zhangsan      qu      Beijing      (de)  
          I    BE      with      Zhangsan      go      Beijing      DE  
          With *de*: 'It was with Zhangsan that I went to Beijing.'  
          Without *de*: 'It is with Zhangsan that I am going to Beijing.' (S&W (2002a:176), Wu (2004:126))



9b) is ‘simpler’ than 9a), since *de* as a determiner holds an *Agree* relation with its (empty) nominal complement ([u-N], [u-D] in ex. 9a)) (cf Abney (1987), Cinque (1994), Longobardi (1994, 1996, 2001), Lyons (1999)), which is lost when *de* is re-analysed as a T element and the empty noun is eliminated

Furthermore, *de* is obligatory when the embedded clause refers to past events (S&W (2002a:175-176), Wu (2004:126-127)):

- ii)      ta   shi      zuotian      qu      Beijing      \*(de)  
          he   BE      yesterday      go      Beijing      DE  
          ‘It was yesterday that he went to Beijing.’ (S&W (2002a:176), Wu (2004:126))

Moreover, when *de* is used in non-past contexts, future/modal auxiliaries are required to override the past-time implicature (S&W (2002a:176), Wu (2004:126)):

- iii)      ta   shi      mingtian      \*(cai      hui)      qu      Beijing      de  
          He   BE      tomorrow      only-then      will      go      Beijing      DE  
          ‘It is tomorrow that he will go to Beijing.’ (S&W (2002a:176), Wu (2004:126))

This past-time implicature of sentence-final *de* forms the background for the re-analysis of *de* as a past tense marker (S&W (2002a:175-177), Wu (2004:140ff), cf Lee (2005a:149ff, 2005b:144ff), Hole (2011:1713)).

<sup>27</sup> This re-analysis is supported by the fact that when *de* is cliticised as a verbal suffix, the embedded clause obligatorily refers to the past and is incompatible with any non-past adverbial constituent (S&W (2002a:176-177, 190), Wu (2004:126-128, 141), Lee (2005a:142-143, 2005b:144-148), Paul and Whitman (2008:429-433), Hole (2011:1713), cf previous footnote, ex. iii)):

- i)      \*Ta   shi      mingtian      cai      hui      qu      de      Beijing  
          He   BE      tomorrow      only-then      will      go      DE      Beijing  
          ‘It is tomorrow that he will go to Beijing.’

Whitman and Paul (2008:430-437) further point out that verbal suffix *de* cannot be used with modal verbs:

- ii)      Zhangsan   shi      shang   ge   xingqi   (\*neng/\*dei)      qu      de      Beijing  
          Zhangsan   SHI      last   CL   week   can/must      go      DE      Beijing  
          ‘It was last week that Zhangsan could/had to go to Beijing.’ (Whitman and Paul (2008:430))

Paul and Whitman (2008:436-437) hence argue that *de* is base-generated in an aspectual head (Asp) in the embedded clause to which the verb raises, since Asp is lower than tense and modal nodes in the functional hierarchy of T elements (cf Cinque (1999)), but this is less convincing, since it cannot account for the association between sentence-final *de* and past-time implicature (see previous footnote) or the re-positioning of *de*. In my analysis, I retain S&W (2002a) and Wu’s (2004) analysis of sentence-final *de* which cliticises onto the verb in the embedded clause.

(ex. 9b)) (cf S&W (2002a:189-190), Wu (2004:140-142)). Furthermore, *de* as a determiner holds interpretable D and phi-features which become uninterpretable when *de* is re-analysed as a T element ([i-D] > [u-D], [i-phi] > [u-phi]) (cf Chomsky (1995:340-342, 2000:102-104, 2001:5-10)).<sup>28</sup> The grammaticalization of Chinese *de*, therefore, conforms to R&R's and van Gelderen's 'structural simplification' (see section 1). However, as *de* is re-analysed as a past tense marker (T(past)), it holds T features (ex. 9b)) which are not in the original structure (ex. 9a)) but are re-analysed from the past-time implicature of sentence-final *de* (see footnote 26). This differs radically from 'F-attraction' in SG where the grammaticalizing element is shifted to a particular functional head in the original structure (see section 1, exs. 6-8)). This will be known as 'Lateral Shift' ('L-shift'), namely the creation of a new functional category (e.g. T) which is absent in the original structure. More will be said about this below.

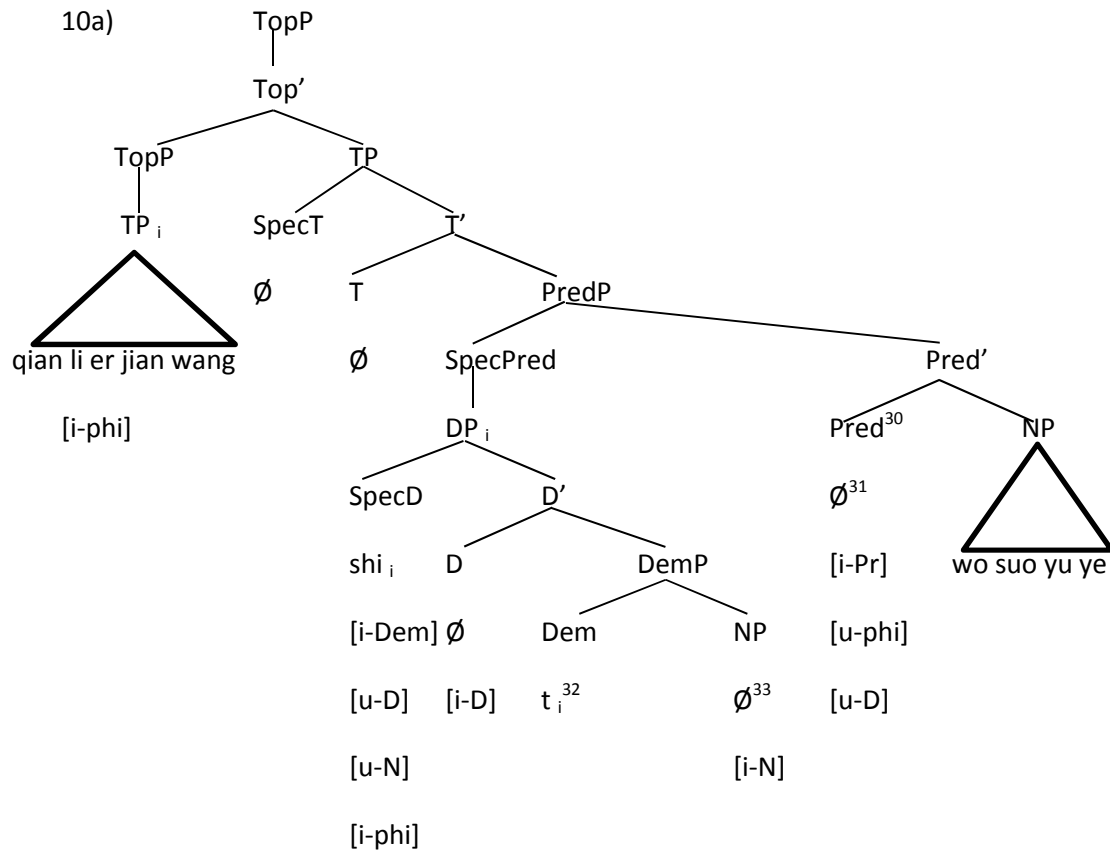
### Section 2.3: Chinese *shi*:

In Tse (2011:section 3.2, 2013a:108-110, 2013b:102-105), I argue that the fact that LG displays 'structural simplification' entails cross-linguistic distribution (cf footnote 5), and I point out another example of LG in the grammaticalization of subject determiners (D) as copula verbs, which can be analysed as T elements since copula verbs regularly inflect for tense and subject agreement (Lyons (1968:322), Li and Thompson (1976:436), Hengeveld (1992:32), cf Roy (2014))<sup>29</sup> e.g. Chinese copula *shi*, which is originally a demonstrative pronoun in Old Chinese and is used as the subject in equational constructions with a co-referring topic (Li and Thompson (1976:420ff), Feng (1993:288ff, 2003:31ff)):

- 10)            qian            li            er            jian            wang  
                  thousand            mile            then            see            king  
                  shi            wo            suo                    yu            ye  
                  this            I            NOMINALISER            desire            DECLARATIVE.PARTICLE  
                  'To see the king after travelling a thousand miles, this (is) what I want.'  
                  (Mencius, 4<sup>th</sup> century BC)

<sup>28</sup> Technically, D elements hold uninterpretable phi-features which are valued by the interpretable phi-features of their nominal complements (van Gelderen (2007:279, 2011d:3ff)), but since the re-analysis of *de* as a T element (ex. 9b)) eliminates the empty noun and its interpretable features (ex. 9a)), it still conforms to van Gelderen's definition of 'Feature Economy' as 'Minimize semantic/interpretable features' (see footnote 13).

<sup>29</sup> Tense (T) and subject-agreement (AgrS) features are commonly subsumed under T (Chomsky (1993:6-9, 1995:172ff, 340ff)), and auxiliary verbs are generally assumed to undergo have a *Move/Agree* relation with T (Pollock (1989), Chomsky (1991)). Copula verbs, therefore, can be argued to be T elements.



As identity is implied, *shi* can be re-analysed as a copula verb in Pred linking the topic (> subject) and the predicate: ‘to see the king after travelling a thousand miles, this (*shi*) what I want’ > ‘to see the king after travelling a thousand miles is (*shi*) what I want’ (Li and Thompson (1976:423-426), Feng (1993:289-291, 301, 2003:30-35), Chang (2006:142ff), van Gelderen (2011a:130-131, 2015c)), and since copula verbs are assumed to check T features (see footnote 29), *shi* moves to T and causes the new subject to move to SpecT via EPP:

<sup>30</sup> Bowers (1993:595ff) posits a unique functional category called Pred(icate) for copular elements (cf Svenonius (1994), Adger and Ramchand (2003:325ff), den Dikken (2006:11-12, 15-20)), which strongly resembles little *v* as both introduce external arguments as their specifier (Bowers (1993:595-596), cf Bowers (2002:183ff), Hale and Keyser (1993), den Dikken (2006:11-12)). There is hence Spec-Head *Agree* between Pred and SpecPred which ensures labelling (van Gelderen (2015a, 2015b), cf Chomsky (2013, 2014)). In my analysis, I place Pred lower than T and postulate *Agree* between Pred and SpecPred. The alternative analysis of copula verbs as raising verbs (Bowers (2001:301ff)) probably does not make much difference to my proposed analysis.

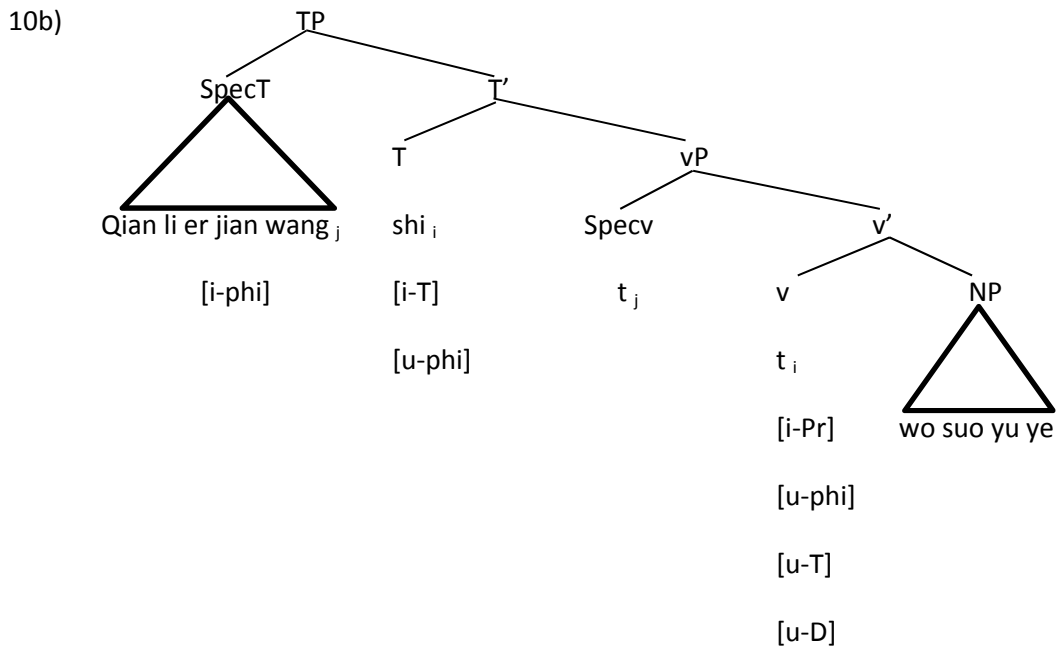
<sup>31</sup> As the comment of equational constructions consists of small clauses (Li and Thompson (1976:420), Feng (1993:289, 2003:32), Chang (2006:142)), Pred is empty here (cf Bowers (1993:595-596, 2001:301-302)).

<sup>32</sup> As it is assumed that demonstratives are lower than D and move to SpecD in order to check D features (Brugè (2001), cf Lyons (1999)), *shi* is base-generated in Dem (or SpecDem (Brugè (2001:32ff)) and moves to SpecD.

<sup>33</sup> Old Chinese *shi* is a demonstrative pronoun meaning ‘this’ and is attested with nominal complements (Wang (1958), Li and Thompson (1976:422-423), Chen (1995), Chang (2006:133)):

i) Zi yu shi ri ku  
Confucius at this day cry  
‘Confucius cried on this day.’ (Mencius, 5<sup>th</sup> century BC)

I therefore assume an empty nominal complement in the DP headed by *shi* (*shi* (∅) ‘this (thing)’).



10b) is ‘simpler’ than 10a), since the *Agree* relation between *shi* in SpecPred and Pred is lost (see footnote 30) and *shi* is re-analysed as a copula verb (SpecPred > Pred) (Lohndal (2009:218ff), van Gelderen (2011a:chapter 4, 2015c), cf Whitman (2000:233-238)). The internal DP structure of *shi* (see footnotes 32 and 33) is hence lost and the former topic (*qian li er jian wang*) is re-analysed as the new subject (Top > SpecPred).<sup>34</sup> Moreover, the interpretable D and phi-features of *shi* become uninterpretable when it is re-analysed as a copula verb ([i-D] > [u-D], [i-phi] > [u-phi]), which hence select the former topic as the new subject (cf van Gelderen (2011a:chapter 4)).<sup>35</sup> The grammaticalization of Chinese *shi*, therefore, conforms to R&R and van Gelderen’s ‘structural simplification’. However, while the shift of *shi* from SpecPred to Pred conforms to ‘F-attraction’ (cf section 1, ex. 6-8), see footnote 8), *shi* also acquires new T features ([i-T] in ex. 10b)) which are not in the original structure where there is no verb (ex. 10a), see footnote 31),<sup>36 37</sup> which comes under ‘L-

<sup>34</sup> The re-analysis of topics as subjects is cross-linguistically robust (Givón (1976:151-155, 1979:209)) and van Gelderen posits a ‘simplicity’ principle called ‘Specifier Incorporation Principle’ (SIP) (cf footnote 8):

i) Where possible, be a specifier rather than an adjunct (e.g. topic). (my brackets)  
(van Gelderen (2006b:17, 2006c:7-8, 2006d:15, 2008c:250, 2009d:105))

<sup>35</sup> Technically, demonstratives have uninterpretable D and phi-features which are checked by D and N respectively (van Gelderen (2011d:3ff), cf footnotes 32 and 33). Nonetheless, as the re-analysis of *shi* as a copula verb eliminates the subject DP and its interpretable features, it conforms to van Gelderen’s ‘Feature Economy’ (cf footnote 28).

<sup>36</sup> Interestingly, copulas verbs derived from subject determiners often display morphological distinctions of tense and subject agreement which correlate with their original deixes as determiners e.g. Panare *kěj* ([i-D:proximative] > [i-T:present]), *něj* ([i-D:distal] > [i-T:future/past]) (Gildea (1993)), Hebrew *hu* [i-phi:MASC.3SG] > [u-phi:MASC.3SG], *hi* [i-phi:FEM.3SG] > [u-phi:FEM.3SG], *hem* [i-phi:MASC.3PL] > [u-phi:MASC.3PL], *hen* [i-phi:FEM.3PL] > [u-phi:FEM.3PL] (Gilnert (1989)). More will be said about this in later chapters.

<sup>37</sup> A closely related change is the re-analysis of subject determiners (D) as subject agreement markers (T), which is categorially the same (D > T) and it also originates from constructions where the subject determiner shows co-reference/phi-agreement with the topic, and as the former is re-analysed as a subject agreement marker, the latter is re-analysed as the new subject (Fuss (2005:chapter 6), cf van Gelderen (2011a:chapter 2, 2011c, 2015a, b), R&R (2003:175-186), cf footnote 34) e.g. non-standard French subject-agreement markers:

i)        Moi            je            porte            la            table  
          Me            I            carry-PRES.1SG    DEF.ART    table  
          ‘As for me, I carry the table’ > ‘I carry (*je-porte*) the table’ (Gerlach (2002:224))

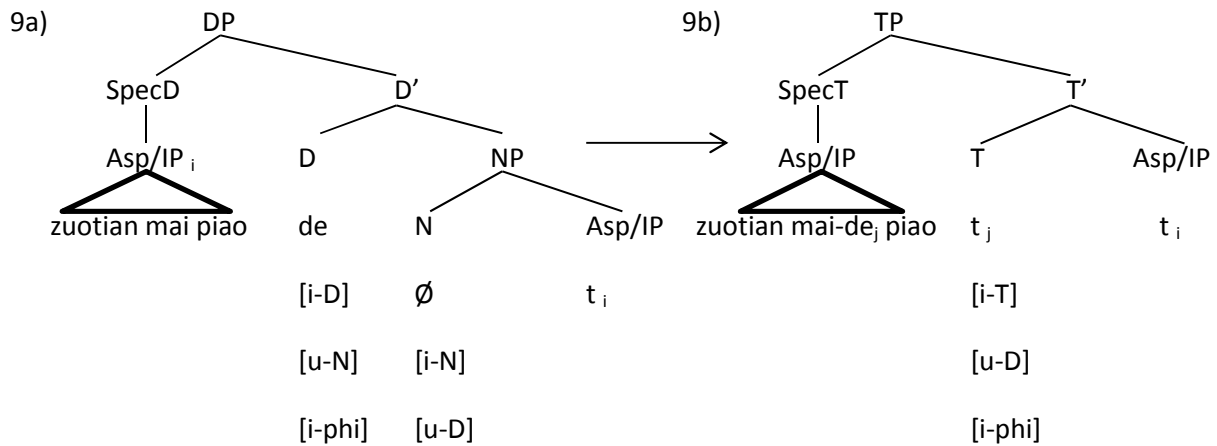
shift' in LG (see section 2.2). The grammaticalization of subject determiners (D) as copula verbs (T), therefore, seems to be a combination of SG ('F-attraction') and LG ('L-shift').<sup>38</sup>

The two examples of LG (Chinese *de* and *shi*), therefore, conform to R&R and van Gelderen's 'structural simplification' but differ from SG in that they display 'L-shift', namely the creation of a new functional category (e.g. T) which is not in the original structure. This may be taken as a diagnostic trait of LG.

#### Section 2.4: 'Lateral Shift':

The two examples of LG can hence be represented thus:

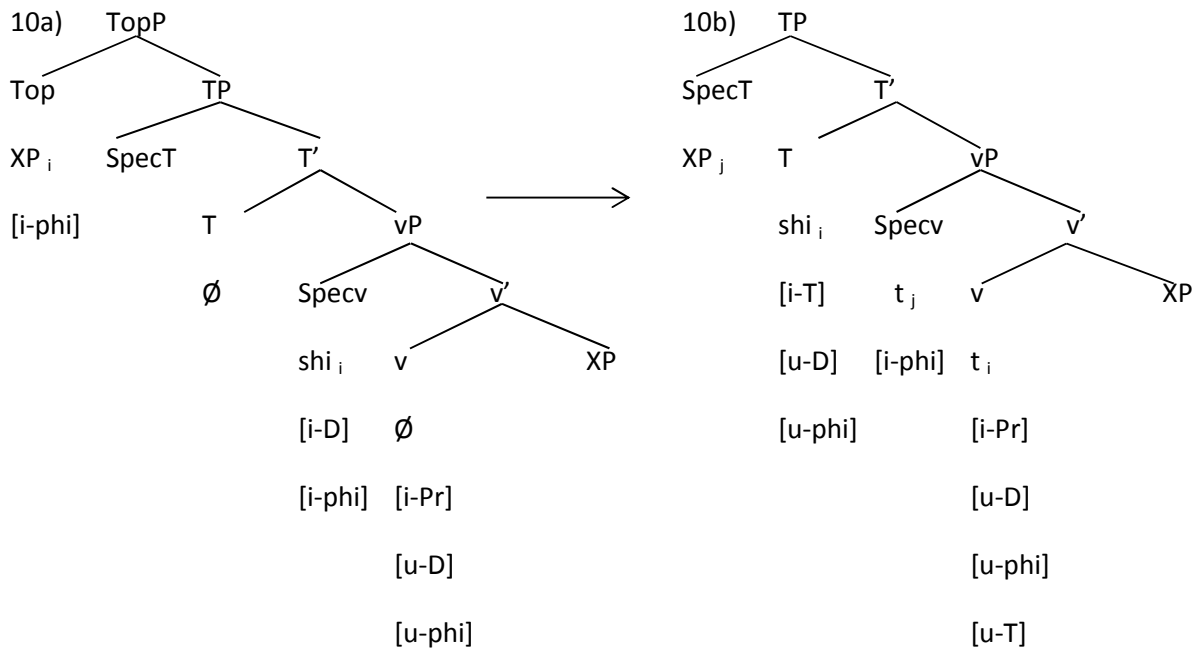
Chinese *de* (section 2.1, ex. 9)):



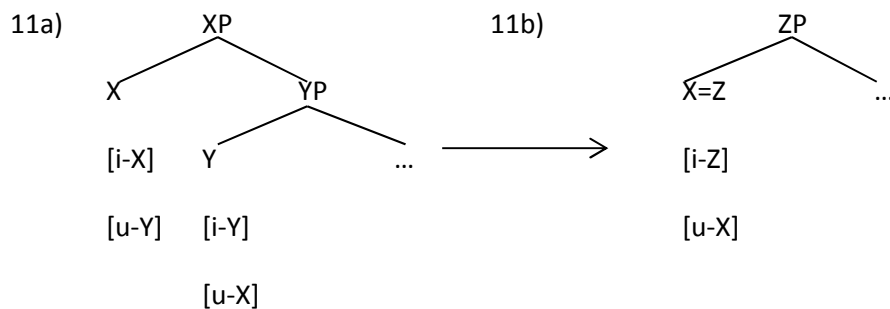
In contrast to equational constructions where there is no verb (ex. 10a), see footnote 31), there is a finite verb (here *porte*) and the grammaticalizing element (here *je*) is shifted to T as a subject-agreement marker (*je-  
porte*), which conforms to 'F-attraction' (SG) (R&R (1999:1026-1027, 2003:175-192)). The grammaticalization of subject-agreement markers (D > T) and the grammaticalization of copula verbs (D > T), therefore, form minimal pairs. More will be said about this in later chapters.

<sup>38</sup> It might be possible to term this change 'semi-lateral' grammaticalization, as it displays mixed effects of SG ('F-attraction') and LG ('L-shift'). More will be said about this in later chapters.

Chinese *shi* (section 2.2, ex. 10):



As both Chinese *de* and *shi* acquire new features ([i-T]) which are not in the original structure, 'L-shift' in LG can be generalised thus:



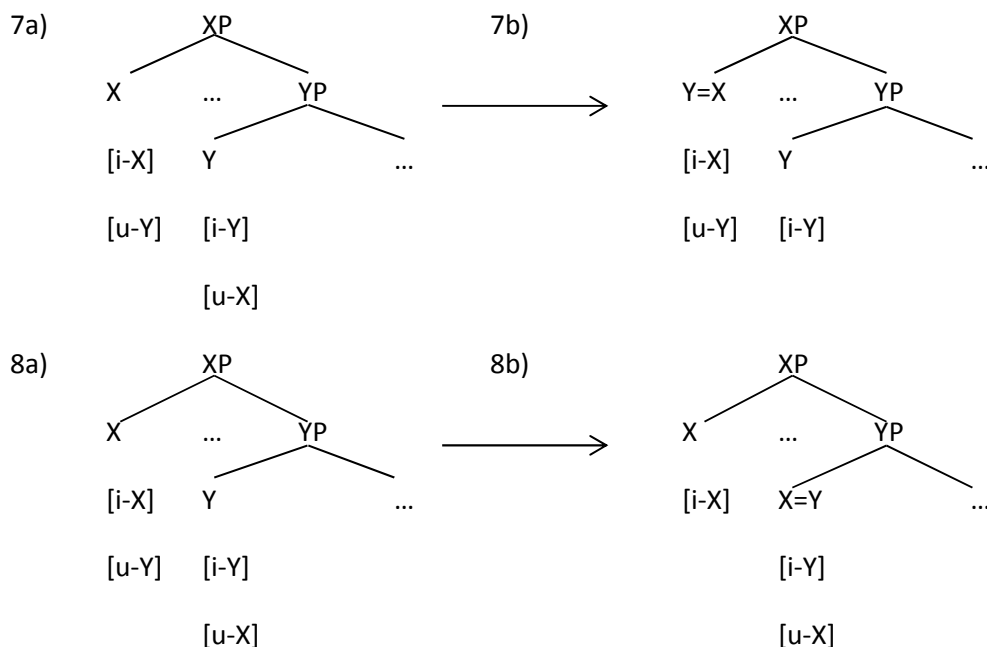
In LG, there is 'structural simplification' in that there is loss of *Agree* ([u-Y], [u-X] in 11a)), reduction of feature places (Y in 11a)) and 'Feature Economy' ([i-X] > [u-X]). However, as the grammaticalizing element is re-analysed as a new functional category entirely (X=Z in 11b)), it holds new formal features ([i-Z] in 11b)) which are not in the original structure. 'L-shift' in LG hence differs radically from 'F-attraction' in SG, the empirical consequences of which are explored in the next section.



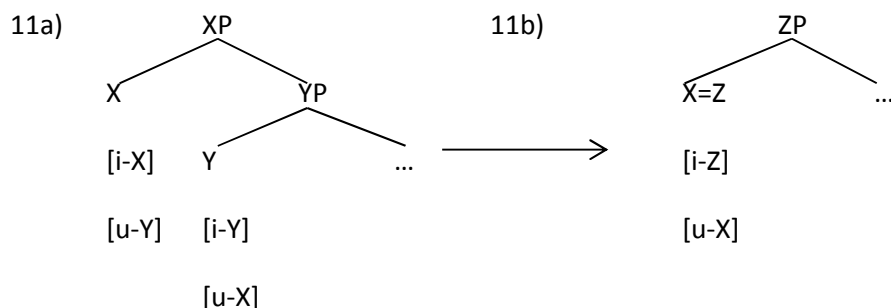
### Section 3: ‘standard’ grammaticalization (SG) vs ‘lateral’ grammaticalization (LG):

The formal representations of SG and LG are repeated here as follows:

SG (=section 1.2, ex. 7-8):



LG ((=section 2.4, ex. 11)):



As ‘F-attraction’ in SG entails that the grammaticalizing element is no longer base-generated in its original position (Y in ex. 7a), X in ex. 8a)) but shifted to its respective functional head (Y=X in ex. 7b), X=Y in ex. 8b)), this entails loss of lexical semantics, namely those associated with the original (lexical) base-position of the grammaticalizing element.<sup>39</sup> In LG, on the other hand, although there is also a reduction in feature-places (Y in ex. 11a)), ‘L-shift’ entails that the grammaticalizing element ends up holding new formal features which are not in the original structure ([i-Z] in ex. 11b)) but derived from pragmatic implicature, namely the past-time interpretation of sentence-final *de* in *shi-de* constructions (see section 2.2, especially footnote 26) and the implication of identity in the

<sup>39</sup> Cf R&R (2003:218-224) who define ‘semantic bleaching’ as the loss of lexical/descriptive content and the retention of functional/logical content in the grammaticalizing element (cf Roberts (2010:66-68, 2012:363-365)).

original equational construction of *shi* (see section 2.3), which entails a gain of semantics in the grammaticalizing element.<sup>40</sup> ‘Semantic bleaching’ is hence justified for SG but not for LG.

Furthermore, while morphophonological weakening to grammaticalizing elements is commonplace in SG (R&R (2003:224-229)), it is conspicuously absent in LG as the two Chinese examples do not seem to display any weakening in morphophonology: Chinese *de* is pronounced exactly the same (toneless and unstressed) both as a sentence-final particle (D) and as a verbal suffix (T) (see sections 2.1-2.2, ex. 9a-b)), and Chinese copula *shi* is still fully toned (tone 4) and stressed in modern Mandarin,<sup>41</sup> as are many cross-linguistic examples of copula verbs derived from subject determiners.<sup>42</sup> Although *de* as a past tense suffix (T) (e.g. *mai-de* in section 2.2, ex. 9b)) is more univerbated than as a clausal clitic (D) (e.g. *zuotian mai piao-de* in section 2.2, ex. 9a)) (cf Zwicky (1985), Traugott et al (1993:7, 2003:7)), this seems to be a case of post-syntactic movement rather than verbal affixation, since it is argued that *de* raises from sentence-final position to the verb rather than the other way round (see footnote 27), which is better understood as PF-movement (cf Embick and Noyer (2001)) rather than verbal affixation. There is, therefore, no weakening in morphology either in LG.

The empirical and interface effects of SG and LG are hence clear: weakening in phonology, morphology and semantics occurs to the grammaticalizing elements in SG but not in LG.<sup>43</sup> It can, therefore, be tentatively and preliminarily argued that ‘F-attraction’ in SG gives rise to morphophonological and semantic weakening whereas ‘L-shift’ in LG does not (cf Tse (2011:section 4, 2013b:section 3)). Such is the relationship between SG and LG.

### Conclusion:

In this chapter, I have provided the current Minimalist definitions of ‘simplicity’ and ‘structural simplification’ which have been argued to underlie grammaticalization (section 1). Furthermore, I have pointed out some formal (section 2) and empirical (section 3) differences between SG and LG which may be interrelated. In the next chapter, I analyse the mechanisms for

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<sup>40</sup> Although pragmatic inferencing is universal in grammaticalization (Eckhart (2006), cf Sweetser (1988), Traugott (1988, 1995:3-5), Traugott et al (1991, 1993:63-93, 2002, 2003:71-98)), it remains the case that ‘L-shift’ in LG creates a new functional category which, unlike ‘F-attraction’ in SG, is not in the original structure and hence entails a gain in semantic content (cf von Stechow (1995) who argues that functional categories do have semantic content, albeit of a different (higher) type from that of lexical categories). I am grateful to an anonymous reviewer of *Historical Syntax* for pointing this out to me.

<sup>41</sup> I am a native speaker of Mandarin Chinese and as far as I know *de* and *shi* have not undergone phonological weakening. I thank three speakers of northern dialects of Mandarin who inform me that *de* is pronounced the same both as a sentence-final particle (D) and as a past tense marker (T(past)).

<sup>42</sup> E.g. Hebrew *hu, hi, hem, hen* (Li and Thompson (1976:427-431)), Palestinian Arabic *huwwe, hiyye* (Li and Thompson (1976:431-433)), Panare *kěj, něj* (Gildea (1993)) (cf footnote 36), none of which are morphophonologically weakened as compared to their original determiner counterparts (Tse (2011:section 3.3, 2013a:111, 2013b:106-107)). A detailed typological survey will be conducted in chapter 4.

<sup>43</sup> It has been suggested to me that as Chinese *de* is already toneless and stressless as a determiner, it cannot undergo further morphophonological weakening (I am grateful to Dr Hendrik De Smet for this). However, the lack of morphophonological weakening in copula verbs derived from subject determiners is certainly striking and needs to be accounted for, since many of them are morphophonologically strong as determiners yet none of them show morphophonological weakening as copula verbs (see previous footnote, cf Tse (2011:section 3.3.1, 2012:sections 3.6, 4)).

weakening in grammaticalization and justify my claim that 'F-attraction', not 'L-shift', is the cause for weakening in grammaticalization.

## Chapter 2: Functional categories and weakening in grammaticalization:

Bybee (*passim*) argues that there is an inverse proportion between frequency and substance (cf Zipf's (1935, 1949)) and that when grammaticalizing elements gain frequency in grammaticalization, they can undergo morphophonological weakening (Bybee (2003a, 2011), Bybee et al (1994)). In this chapter, I analyse SG and LG in light of Bybee's arguments and propose refinements which can account for the differing weakening effects in SG and LG (see chapter 1, section 3).

### Section 1.1: Emergent Grammar and Exemplar Theory:

In contrast to generative grammar, Bybee subscribes to a view of language which does not assume an innate component of grammar but argues that grammar is constantly emerging from language use (Bybee (1998a:421-424, 1998b, 2001a:1ff, 14-21, 2010:1-2), Bybee et al (1994:1-2, 2001:1ff), cf Lindenblom et al (1984), Kemmer and Barlow (2000)).<sup>44</sup> In this model, grammar consists of exemplars which are stored memory representations of linguistic structures and analogical networks of exemplars which constitute phonological, morphological and syntactic patterns (Bybee (1998a:422-425, 1999:214-220, 2001a:chapter 2, 2006:716-719, 2010:chapter 2), cf Langacker (1987:chapters 2-3, 1988:22ff, 1991:2ff, 2000:3-5)). Furthermore, as exemplars are argued to be rich in detail, they are highly sensitive to the frequencies and contexts from which they are derived (Bybee (1994:295-298, 1998a:421-423, 1998b:253ff, 2001a:chapter 3, 2002b:220ff, 2006:716-718, 2010:20-22), Bybee et al (2008:399-402)). In this section, I outline Bybee's frequency effects which are argued to underlie morphophonological weakening in grammaticalization.

### Context 1.2: 'Ritualization':

It is commonly noted that repetition causes a loss of stimuli and hence an increase in the fluency of neuromotor mechanisms and a reduction of articulatory gestures (Bybee (2001a:8-10, 14-16, 2006:723-726, 2010:20ff), Bybee et al (2008), cf Haiman (1994, 1998), Boyland (1996)). This is known as 'ritualization' (Haiman (1994:4ff)),<sup>45</sup> which accounts for the fact that frequently used

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<sup>44</sup> In chapter 1, section 1.1, footnote 5, the following schema is provided for generative models of language acquisition and change:

3)	Trigger	+	genotype	+	extra-linguistic factors	—————>	phenotype
4)	PLD	+	UG	+	III	—————>	Grammar

As Bybee rejects UG and relies solely on language use (PLD) and domain-general cognitive abilities (III) in accounting for the creation of grammar (Bybee (2001a:7, 2007:6-7, 2010:1-2, 6-8)), her model of language acquisition and change may be schematised thus:

5)	Trigger	+	extra-linguistic factors	—————>	phenotype
6)	PLD	+	III	—————>	Grammar

The key difference, therefore, lies in the existence of UG and whether it plays a role in language acquisition and change (cf Hopper's (1987, 1988, 1998a) *a priori* grammar vs *a posteriori/emergent* grammar). Due to my lack of relevant expertise, I refrain from this debate (for which see Elman et al (1998)) and shall only note the empirical differences between these two alternatives.

<sup>45</sup> Similar terms such as 'habituation', 'automatization', 'emancipation', 'entrenchment' and 'conventionalization' refer to the same phenomenon, namely the morphophonological weakening of frequently used items (Haiman (1994:5-6), Langacker (1987:59, 100, 2000:5ff), cf Bybee (1998b:261-263, 2003b, 2006:)). In this paper, 'ritualization' will be used as a cover-term.

words tend to be shorter than less frequent ones (cf Zipf (1935:chapters 2 and 3)) e.g. schwa deletion in American English (Bybee (2000:66ff, 2001a:40ff, 2007 [1976]:24-26)).<sup>46</sup>

Table 1 (from Bybee (2000:68), cf Bybee (2001:41), frequency figures from Francis and Kucera (1982)):

No schwa	Syllabic [r]	Schwa + [r]
Every (492)	Memory (91)	Mammary (0)
	Salary (51)	Artillery (11)
	Summary (21)	Summery (0)
	Nursery (14)	Cursory (4)
Evening (149) (noun)		Evening (0) (verb + <i>ing</i> )

There is phonetic gradience in schwa deletion here which seems to correlate with the frequency of the lexical items, since while it is most evident in the most frequent words (*every*, *evening* (noun)), it is less evident in less frequent words (*memory*, *salary*, *summary*, *nursery*) and unattested in the least frequent words (*mammary*, *artillery*, *summery*, *cursory*, *evening* (verb + *ing*)) (Bybee (2000:68-69)).<sup>47</sup> Frequency, therefore, does seem to have a catalytic effect on the reduction of lexical items, which attests to a slackening of articulatory gestures in frequently used elements (cf Pagliuca and Mowrey (1987, 1995), Browman and Goldstein (1990, 1992a, b)).<sup>48</sup>

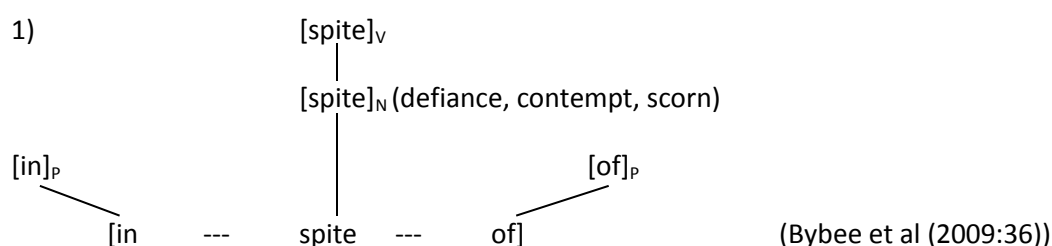
### Section 1.3: ‘chunking’:

Another effect of frequency is that frequently used word sequences may be processed as individual memory units (Bybee (1998a:424-426, 2002a:111-115, 2002b:215-219), cf Newell (1990), Boyland (1996), Ellis (1996), Ellis and Larsen-Freeman (2006)). This is known as ‘chunking’ (Bybee (2002a, 2010:chapter 3)), namely the creation of new constituents out of frequently used sequences of words (‘chunks’) e.g. English complex preposition *in spite of*, which has lost its original composite structure and come to be analysed as a single prepositional unit ([in [spite [of]]] > [in spite of]) (Bybee (2010:140ff, 2011:71-75), Bybee et al (2009:35-36), cf Hoffmann (2005)):

<sup>46</sup> This weakening effect has also been explained from the listener’s perspective, since it has been argued that the high predictability of frequently used words/phrases entails that they do not need to be fully articulated in order to be understood (Gregory et al (1999), Jurafsky et al (2001, 2002), cf Lindblom (1990)). High frequency, therefore, has a weakening effect both from speaker’s and from the listener’s perspectives.

<sup>47</sup> Similar frequency effects are also attested in the deletion of intervocalic *d* in Mexican Spanish, which is more evident in frequent words (e.g. *nada* ‘nothing’) than in less frequent ones (e.g. *cada* ‘each’) (Bybee (2001a:42ff, 2002c:265ff), Bybee et al (2008:400ff)), and in the deletion of word-final *t/d* in American English, which is more evident in frequent words (e.g. *told*, *felt*, *left*, *kept*, *sent*) than in less frequent ones (e.g. *lent*, *found*, *lost*, *meant*) (Bybee (1999:220ff, 2000:69ff, 2002c:268ff)).

<sup>48</sup> Browman and Goldstein (1990:342, 1992a:27, 1992b:160) propose a model of articulatory phonology (‘Gestural Computational Model’ (GCM)) which mediates between the intended utterance and output speech and produces overlapping (i.e. weakened) articulatory gestures in fluent (e.g. casual) speech (Browman and Goldstein (1990:345, 1992a:36-37, 1992b:171ff)).



Evidence for this ‘chunking’ is seen in examples where *in spite of* is co-ordinated with simple prepositions and hence functions as a single constituent (Bybee et al (2009:35-38), Bybee (2010:142, 2011:74)):

- 2) Scorsese’s strongest works are fictions of formation, in which a religious conviction comes *with* or *in spite of* a vocation. (Corpus of Contemporary American English, in Bybee et al (2009:41))

As *in spite of* is co-ordinated with a single preposition *with*, it is argued that *in spite of* has been re-analysed as a single constituent (Bybee et al (2009:41), cf Huddleston et al (2002: ‘Chunking’ can also cause morphophonological weakening to the previously separate component parts e.g. English *going to* + infinitive > *gonna* + infinitive, where *going to* is grammaticalized as a future tense marker and as it becomes a single constituent ([going [to]] > [gonna]), it undergoes morphophonological weakening ([gʊɪŋ tu] > [gənə]) (Bybee (1998b:260-261, 2003b:146-147, 2006:719-22), cf Krug (2000)).<sup>49</sup>

- 3) Bill’s gonna (< going to) go to college after all.  
(my brackets) (Hopper and Traugott (1993:1, 2003:1))

Furthermore, Bybee (1985:13-19) proposes that semantic relevance and generality give rise to verbal affixation, and she proposes the following types of verbal affixes based on cross-linguistic data (Bybee (1985:20ff)):

Table 2 (from Bybee (1985:24)):

Category	Inflectional	Lexical
Valence	X	X
Voice	X	X
Aspect	X	X
Tense	X	
Mood	X	
Number agreement	X	(X)
Person agreement	X	
Gender agreement	X	

<sup>49</sup> This kind of ‘chunking’ is very prevalent in the grammaticalization of English semi-modals (Krug (1998, 2000)) e.g. *have to* > *hafta*, *got to* > *gotta*, *used to* > *useda*, *want to* > *wanna*.

Furthermore, Bybee (1985:33-35) observes the following cross-linguistic ordering of verbal affixes (cf Bybee (1986:25)):

#### 4) Verbal stem-aspect-tense-mood-person

As grammaticalizing elements undergo semantic weakening, therefore, they may become affixed to their respective lexical stems (Bybee et al (1985:70, 1991:34ff)).

High frequency, therefore, can also affect the morphological and constituent boundaries of linguistic elements. Such is Bybee's account of morphophonological weakening. In the next section, I examine her analysis of the frequency effects of grammaticalization.

#### Section 1.4: 'Context expansion':

In order to account for the rise of frequency of grammaticalizing elements in grammaticalization, Bybee (2003a) analyses the grammaticalization of Old English (OE) lexical verb *cunnan* 'to know' as Modern Day English (MDE) modal verb *can* and argues that as the grammaticalizing element undergoes semantic weakening, it becomes semantically general and undergoes an analogical expansion in its range of complementation which entails a rise in type and token frequency (Bybee (2003a:611ff), cf Bybee (1988:254ff)).<sup>50 51 52</sup> As OE *cunnan* is originally a lexical verb meaning 'to know', it is only used with animate subjects and infinitival complements which denote intellectual states, activities, communication and skills (Bybee (2003a:607-608)):

5) He ne        con        ongitan        forhwy swylc    God        gepafad

He NEG     CAN     understand     why     such     God     allows

'He does not understand why God allows such as that.'

(950 Alfred's Boeth. Xxxix (Bybee (2003a:608))<sup>53</sup>

<sup>50</sup> Bybee (2001a:10-13, 2003a:604-605, 2007:9-14) makes a distinction between token and type frequency, the former referring to the total number of attestations of a particular linguistic element in a particular corpus while the latter to the total number of attestations of a particular grammatical pattern, which, in the case of OE *cunnan*, consists of the types of infinitives used with it. The fact that OE *cunnan* undergoes an expansion in its type frequency entails a rise in its token frequency (Bybee (2003a:605)).

<sup>51</sup> This form of 'context expansion' is very common in grammaticalization and has been classified as a diagnostic trait (Heine (2003:578-579), Himmelmann (2004:32-33), Brinton and Traugott (2005:99)).

<sup>52</sup> In this model, therefore, there is an intrinsic causal relationship between 'semantic bleaching' and 'phonological weakening'/'univerbation', as the former is prerequisite to the latter (cf Haspelmath (1999:1062), Campbell (2001:120-122) and semantics and morphophonology develop in parallel in grammaticalization ('Parallel Reduction Hypothesis'/'Co-evolution of Meaning and Form') (Bybee et al (1985:76, 1994:6, 19-21)).

<sup>53</sup> OE *cunnan* also takes nominal complements which denote mental stimulus (Bybee (2003a:606), cf Lightfoot (1979:101)) e.g.

i)        Ge dweliad        and        ne        cunnon halige        gewritu  
          You mistaken        and        NEG     know     holy        writings

'You are led into error and do not know the holy writings.' (Ags Gospel of Matthew xxii)

However, as grammaticalization is construction-specific (Lehmann (1995:vii), Bybee et al (1994:11), Traugott (2003), Himmelmann (2004:31)), examples of *cunnan* selecting non-infinitival complements are irrelevant to the grammaticalization of *cunnan* as a modal auxiliary and are hence excluded.

In Chaucer, there are the first attestations of *cunnan* selecting infinitival complements which do not necessarily denote knowledge or skills, which leads to the re-analysis of *cunnan* as a modal auxiliary expressing possibility (Bybee (2003a:612-613)):

6) Til            we    be    roten, kan    we    nat    be    rype  
       Until        we    be    rotten can    we    NEG   be    ripe

‘Until we are rotten, it is not possible for us to be ripe.’ (Chaucer, *A. Rv.* 3875)

The re-analysis is complete when *cunnan* is used with inanimate subjects (Bybee (2003a:614), cf Bybee et al (1991:23-25)):

7) No worldely            thyng    can    be    without styfe.

‘No worldly thing can be without strife.’ (1509 Hawes Past. Pleas. Xvi.xlix)

The ‘context expansion’ of OE *cunnan*, therefore, can be represented thus (cf Bybee (1988:255-256, 2003a:606)):

Table 3 (from Bybee (2003a:606)):

Stage	Meaning	Subject	Main Verb
Mental Ability	Mental	Human agents	Intellectual states and activities Communicating Skills
Ability	-	Human agents	All of the above Overt actions and activities
Root possibility	-	Human agents Passive subjects Inanimate subjects	All of the above

In the grammaticalization of OE *cunnan*, therefore, the following constructional schema is postulated (Bybee (2003a:613), cf Bybee (2010:128)):

8) SUBJ            CAN    INFINITIVE<sup>54</sup>

As there is an increase in the type and token frequency of the grammaticalizing element (here OE *cunnan*) (see footnote 53), the grammaticalizing element undergoes phonological weakening as MDE *can* ([kn])<sup>55 56 57</sup> (Bybee (2003a:615-618)).

<sup>54</sup> As Bybee subscribes to Emergent Grammar (see section 1.1, especially footnote 44), syntactic patterns consist of constructional schemata derived from language use (cf footnote 53, Bybee (2006, 2010, 2012:529ff, 2013:51ff), cf Construction Grammar (CG) (Croft (2000, 2001), Goldberg (1995, 2006)). Syntactic change, therefore, lies in the changes in constructional schemata (Traugott and Trousdale (2013), Trousdale (2010, 2012, 2014)), which, in the case of OE *cunnan* (and English (pre-)modals in general (Bybee (2010:128ff))), give rise to ‘context expansion’.



Such is Bybee's analysis of 'context expansion' in grammaticalization, which entails morphophonological weakening to the grammaticalizing element. In the next section, I examine Bybee's proposals in the context of Minimalism, which, despite some radical differences, need not be seen as mutually exclusive.

### Section 2.1: Minimalism and weakening:

Although Bybee's arguments for weakening in grammaticalization are well made and highly influential (cf Haspelmath (1999:1054-1059), Campbell (2001:121-123)), her model is too unconstrained (if not dangerously circular) in that she merely observes the relative frequencies of discourse patterns but does not account for them.<sup>58</sup> Without an independent explanation for the distribution of discourse patterns in language use, there is nothing in Bybee's account which can account for the differing frequency and weakening effects in grammaticalization, as seen in LG (see chapter 1, section 3). Furthermore, although Bybee's model differs radically from generative grammar in not assuming a universal component of language (see section 1.1, especially footnote 45), her frequency effects are by no means mutually exclusive with Minimalism, since generative models of syntax do include interface components of morphophonology (and semantics) which may well be sensitive to usage frequency.<sup>59</sup> In this section, I maintain the formal differences between SG and LG and examine their frequency and weakening effects in terms of Bybee's proposals.

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<sup>55</sup> The weakening of MDE *can* (and all modals) is subject to contextual factors, since they are only weakened when followed by a lexical verb and not elsewhere (Selkirk (1996:193-207, 2004:469-479), cf Anderson and Lightfoot (2002:18-19, 25-32)). Nonetheless, MDE modals are morphophonologically weak (cf R&R (2003:220-221)), and Bybee (2003a:615) notes that MDE *can* is further weakened as [n] when it is used with the first person singular subject pronoun.

<sup>56</sup> In certain dialects of English, the original lexical meaning of OE *cunnan* 'to know' is retained e.g. Scottish *ken* [kɛn], which is pronounced more strongly than MDE *can*. I am grateful to Drs Andrew Macfarlane and Marc Alexander for helping me on the Scottish data.

<sup>57</sup> Similar 'context expansion' has been argued for English *in spite of* and *going to* > *gonna* (see section 1.3): English *in spite of* is originally used with complements of the main noun *spite* which are compatible with its original lexical meaning 'defiance, contempt' and eventually *in spite of* comes to be used with a wider range of complements which are not necessarily compatible with the original meaning of *spite* (Bybee (2011:71-72), Bybee et al (2009:35-38)); English *going to* is originally used with animate subjects and infinitival complements that denote purpose of motion but eventually comes to be used with inanimate subjects and infinitival complements that do not denote purpose as well (Bybee (1988:254-256, 1998b:260-262, 2003b:147, 2006:719-721, 2010:30-31, 107-110)). Such 'context expansion' and consequent rise in frequency reinforce the effects of 'chunking' (see section 1.3).

<sup>58</sup> To be fair, Bybee does mention some discourse factors which seem to have differing frequency and weakening effects e.g. English *don't*, which is pronounced weakest when it is used with the first person singular pronoun (*I*) and some common verbs e.g. *I don't know* [aɪəŋə] (Bybee and Scheibman (1999), cf Scheibman (1997, 2000, 2001, 2002)); English *gonna*, which is further reduced when it is used with the first person singular pronoun e.g. *I'm gonna* [aɪməŋə] (Bybee (1998b:260, 2003b:146, cf section 1.2, ex. 3)). However, these observations are sporadic and without a principled explanation for the general distribution/frequency of linguistic structures in discourse it is impossible to account for the creation of grammar via discourse. This criticism extends to models of CG (see footnote 54) which assume constructions to be units of form-meaning pairings but do not account for them. In the rest of this chapter, I propose to derive the frequency/structure of constructions from Minimalist parameters (cf Roberts (2010, 2012)).

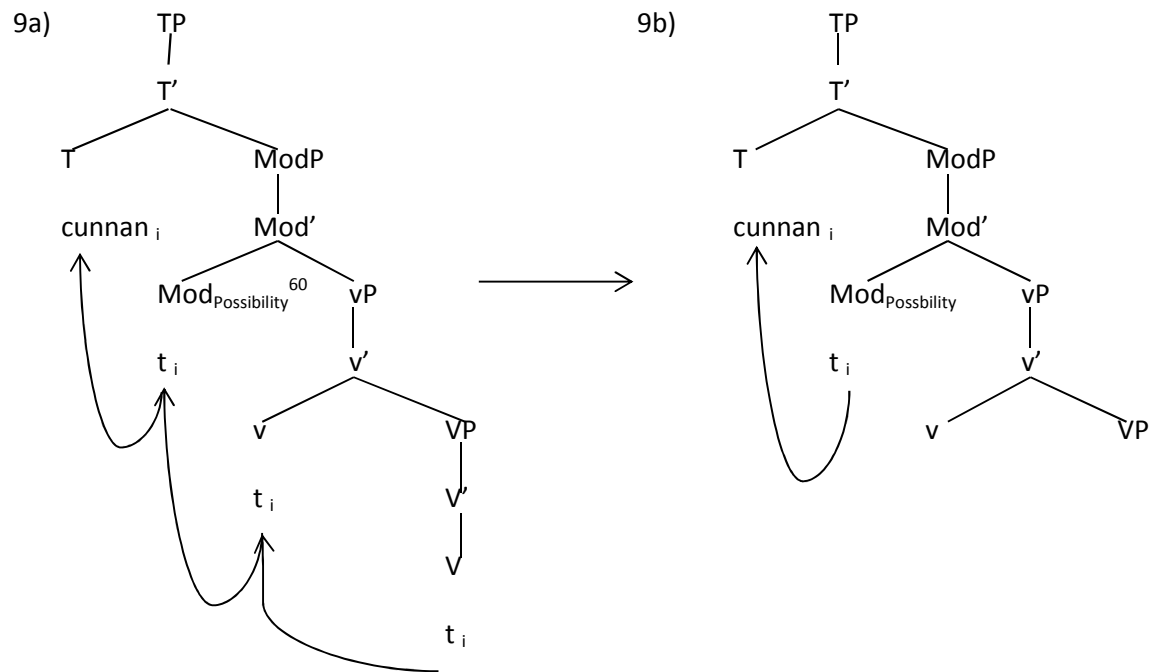
<sup>59</sup> Traditionally, syntactic structures are sent to phonology (Phonetic Form (PF)) and semantics (Logical Form (LF)) at the end of the derivation for interpretation ('Spell-Out') (Chomsky (1965:15ff, 1981:54ff, 1993:1-4, 1995:22, 168-169, 219-221)). In recent Minimalism, Spell-Out, PF and LF are renamed Transfer, PHON and SEM respectively and Transfer is now argued to take place at Phase boundaries where certain parts of the derivation (Narrow Syntax (NS)), namely the complement of the phase, are sent to PHON and SEM (Chomsky

## Section 2.2: ‘Functional Attraction’ and weakening (SG):

In the previous chapter, it is argued that the grammaticalizing element in SG loses its original *Agree/Move* relations and is shifted to its respective functional head via *Merge* (‘F-attraction’) (see chapter 1, section 1, ex. 6-8)). Functional categories play an important part in Minimalism, since they are assumed to be morphological and immune to theta-marking and argument structure (Ouhalla (1991:11ff), Chomsky (1993:6-10, 27-29, 1995:172ff, 192-199)). Moreover, recent research on cartography has established fixed universal orders of functional projections (Cinque (1999, 2001b), Rizzi (2004), Belletti (2004)). The grammaticalization of OE *cunnan* (V) as MDE *can* (Mod<sub>Possibility</sub>), therefore, can be represented thus (cf section 1.4):

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(2000:90-91, 2001:4), cf Seidl (2001), Dobashy (2003), Ishihara (2007), Samuels (2009, 2012)). Furthermore, models of Distributed Morphology (DM) have introduced a component called Morphological Structure (MS) which modifies the morphological structure of syntactic terminals prior to PHON/PF (Halle and Marantz (1993:114), Marantz (1997, 2001)). Although the exact nature and mechanisms of these interface options are notoriously mysterious (Chomsky (2000:90-91, 99-100), cf Scheer (2010:613ff)), it is uncontroversial that they should be sensitive to the frequency of the syntactic terminals and the constructions they entail (see footnotes 53 and 54, cf ‘cues’ in chapter 1, footnote 7). Frequency-induced articulatory weakening may hence be included as part of PF/PHON (cf Pak (2008:26ff) and Scheer (2010:621-622) who argue that PF/PHON includes phonetic processes which may well include Browman and Goldstein’s GCM (see footnote 48)). There is, therefore, no incompatibility between the interface options of minimalist syntax and Bybee’s frequency effects. Indeed, Bybee (2007:18-19) does recognise the possibility that frequency may be the effect, rather than the cause, of grammar, which may correspond to NS in Minimalism (see previous footnote, cf Bybee and McClelland (2005, 2007)).



As OE *cunnan* (and all English pre-modals) is a lexical verb (V) (Lightfoot (1979:98ff), Warner (1993:100-102)), it undergoes V-to-T Move (Roberts (1985:35ff, 1993b)), and when it is grammaticalized as a modal verb (Mod), V-to-Mod Move is lost and *cunnan* is merged directly in Mod (cf R&R (1999:1023, 2002:30-31, 2003:40-41), Roberts (2010:58)). The grammaticalization of OE *cunnan* (V) as MDE *can* (Mod), therefore, displays ‘structural simplification’ and ‘F-attraction’. Furthermore, as lexical verbs have argument structure, OE *cunnan* ‘to know’ imposes selectional restrictions on its complements, namely animate subjects (<agent>) and objects denoting mental activity (<stimulus>). As a modal verb (Mod), MDE *can* has no such selectional restrictions and may hence be used with a wider range of complements, namely inanimate subjects and objects which do not necessarily denote mental activity.<sup>61</sup> The ‘context expansion’ of OE *cunnan* > MDE *can*, therefore, can be explained by the structural differences between lexical (e.g. V) and functional (e.g. Mod) categories, as represented below:

<sup>60</sup> In Cinque’s (1999) cartography of T elements, the various modal heads are merged lower than tense, since modal verbs are cross-linguistically placed lower than tense markers (Cinque (1999:89)):

Italian:

- |     |          |      |            |                 |                 |       |        |       |
|-----|----------|------|------------|-----------------|-----------------|-------|--------|-------|
| i)  | Neanche  | loro | sar-a-nno  | allora          | necessariamente | dalla | vostra | parte |
|     | Not.even | they | be-FUT-3PL | then            | necessarily     | from  | your   | part  |
| ii) | *Neanche | loro | saranno    | necessariamente | allora          | dalla | vostra | parte |
|     | Not.even | they | be-FUT-3PL | necessarily     | then            | from  | your   | part  |
- ‘Not even they will then necessarily be on your side.’

As it is argued that the temporal adverb *allora* ‘then’ is merged in SpecT(future) and the adverb (*non*) *necessariamente* ‘(not) necessarily’ in SpecMod, the fact that *allora* can only precede (i) and not come after (ii) *necessariamente* entails that T(future) is merged higher than Mod. Assuming minimality in Head-to-Head Move (Travis (1984), Koopman (1984), Baker (1985, 1988), Rizzi (1990)), *cunnan* traverses all the functional heads in its V-to-T Move.

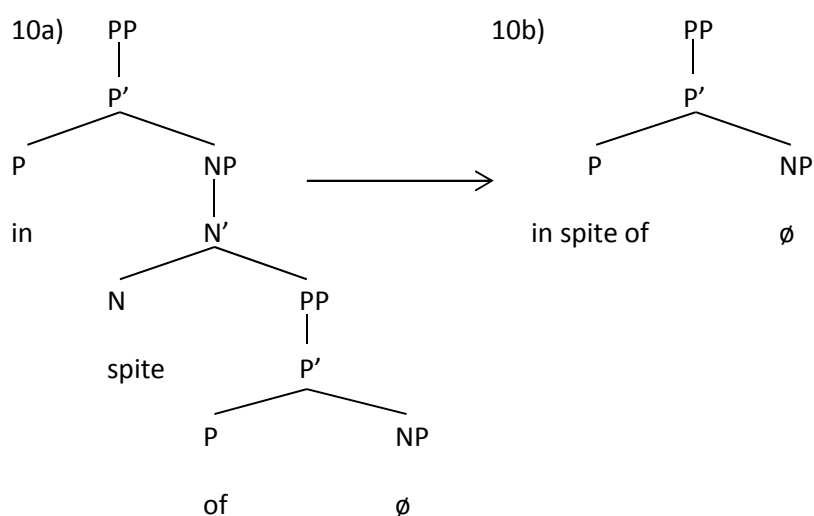
<sup>61</sup> This loss of argument structure can be accounted for structurally, since it has been argued that argument structure is configurationally determined, which, in the case of verbs, is projected within vP (Hale and Keyser (1993, 2002), cf Baker (1988)). When *cunnan* is merged in Mod, therefore, it is merged higher than little v and hence no longer possesses argument structure (cf R&R (2003:220)).

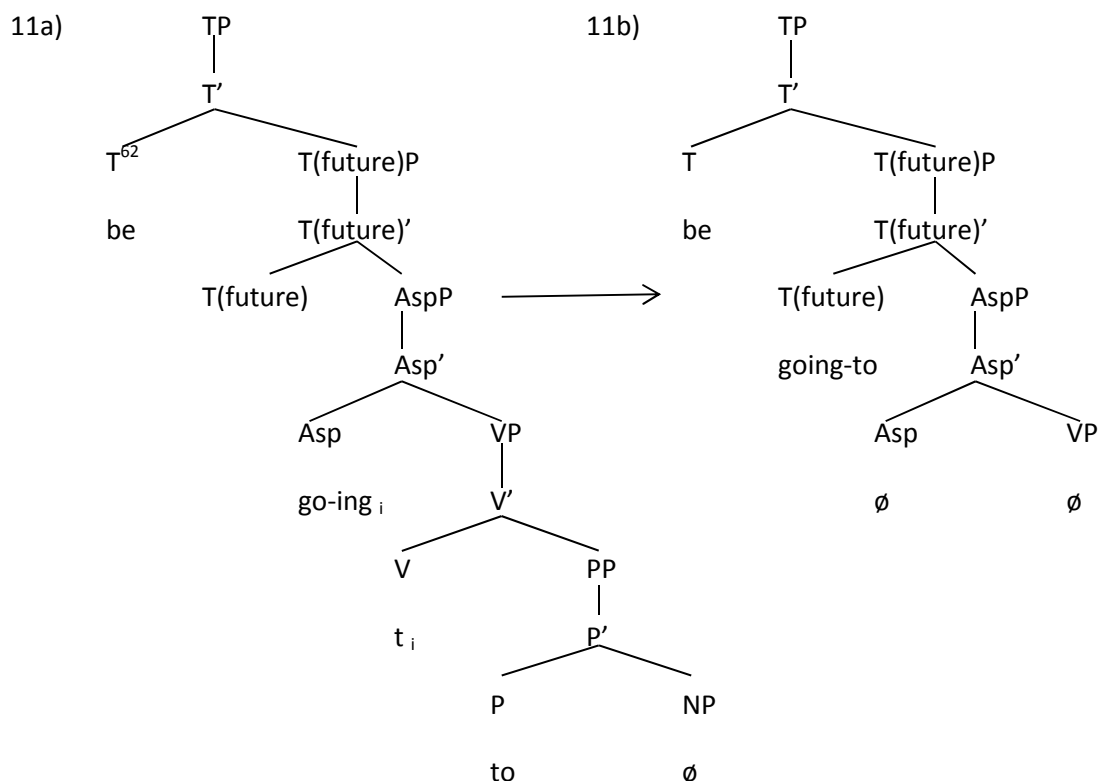
Table 4 (cf section 1.4, Table 3):

Stage	Meaning	Subject	Main Verb (complement)
Mental Ability (V)	Mental 'to know'	Human agents <agent>	Intellectual states and activities Communicating Skills <stimulus>
Ability (V)	-	Human agents <agent>	All of the above Overt actions and activities <->
Root possibility (Mod <sub>Possibility</sub> )	Possibility	Human agents Passive subjects Inanimate subjects <->	All of the above <->

The rise in frequency and consequent morphophonological weakening of MDE *can* [kn] hence follow (see section 1.4).

Similarly, 'chunking' in grammaticalization can be explained by readjustments in constituent boundaries e.g. English *in spite of*, *going to* > *gonna* (cf section 1.3, ex. 2-3)):





As English *in spite of* and *going to* are grammaticalized as a preposition (P) (ex. 10)) and future tense marker (T(future)) (ex. 11)) respectively, they display 'structural simplification' and 'F-attraction' as the grammaticalizing elements are shifted to a higher functional head (*spite* (N > P), *going* (V > T(future))). As they are no longer base-generated in their original lexical positions (N, V), they similarly lose their argument structure and hence no longer impose selectional restrictions on their complements (see footnote 57). 'Context expansion' and rise in frequency hence follow (see footnote 57), which reinforce the constituent readjustments in 'chunking' ([in *spite of*]] > [in spite of], [going [to]] > [gonna], cf section 1.3).

Furthermore, as functional categories are assumed to be morphological, they enter into feature-checking (*Move/Agree*) relations with their lexical complements in forming morphologically complex words (Baker (1985, 1988), Pollock (1989), Ouhalla (1991), Chomsky (1993:6-10, 27-29, 1995:172ff, 192-199)). When grammaticalizing elements are merged in functional heads, therefore, they undergo morphological affixation with their lexical complements within the cartographic structure of functional heads e.g. T elements (Cinque (1999:106)):

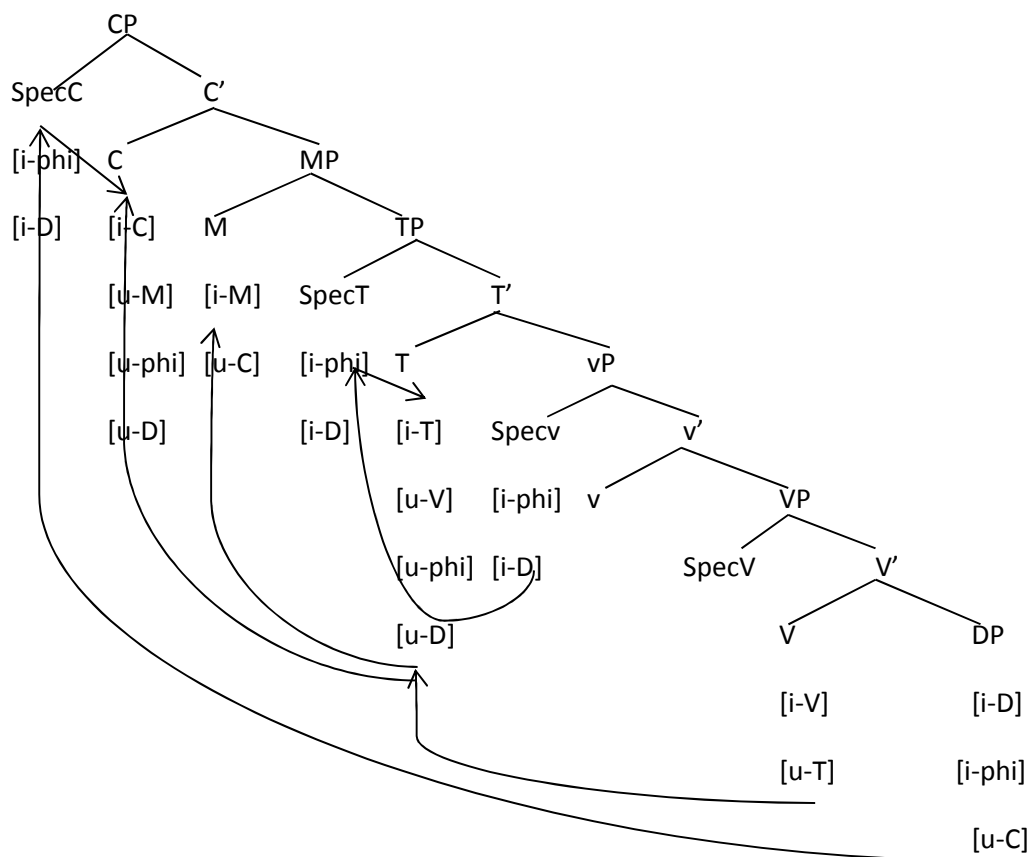
12) Mood <sub>speech act</sub>	Mood <sub>evaluative</sub>	Mood <sub>evidential</sub>	Mod <sub>epistemic</sub>	T(past)
T(future)	Mood <sub>irrealis</sub>	Mod <sub>necessity</sub>	Mod <sub>possibility</sub>	Asp <sub>habitual</sub>
Asp <sub>repetitive(I)</sub>	Asp <sub>frequentative(I)</sub>	Mod <sub>volitional</sub>	Asp <sub>celerative(I)</sub>	T(Anterior)
Asp <sub>terminative</sub>	Asp <sub>continuative</sub>	Asp <sub>perfect</sub>	Asp <sub>retrospective</sub>	Asp <sub>proximative</sub>
Asp <sub>durative</sub>	Asp <sub>generic/progressive</sub>	Asp <sub>prospective</sub>	Asp <sub>SgCompetive(I)</sub>	Asp <sub>PlCompetitive</sub>
Voice	Asp <sub>celerative(II)</sub>	Asp <sub>repetitive(II)</sub>	Asp <sub>frequentative(II)</sub>	Asp <sub>SgCompetive(II)</sub>

<sup>62</sup> In Cinque's (1999:87-88) hierarchy of T elements, T(past) is above T(future) which makes it possible to denote past tense within the future tense paradigm (e.g. English *is/was going to* + infinitive). Furthermore, as *go-ing* inflects for progressive aspect, it undergoes *Move* to Asp<sub>Progressive</sub> which is lost when *going to* is re-analysed as a future tense marker in (T(future)).

As lexical verbs traverse all of these functional projections in *V-to-T Move* (Cinque (1999:58ff)), cf footnote 60), they display Bybee's cross-linguistic sequence of verbal affixes (aspect-tense-mood-person) (see section 1.3, ex. 4)).<sup>63</sup>

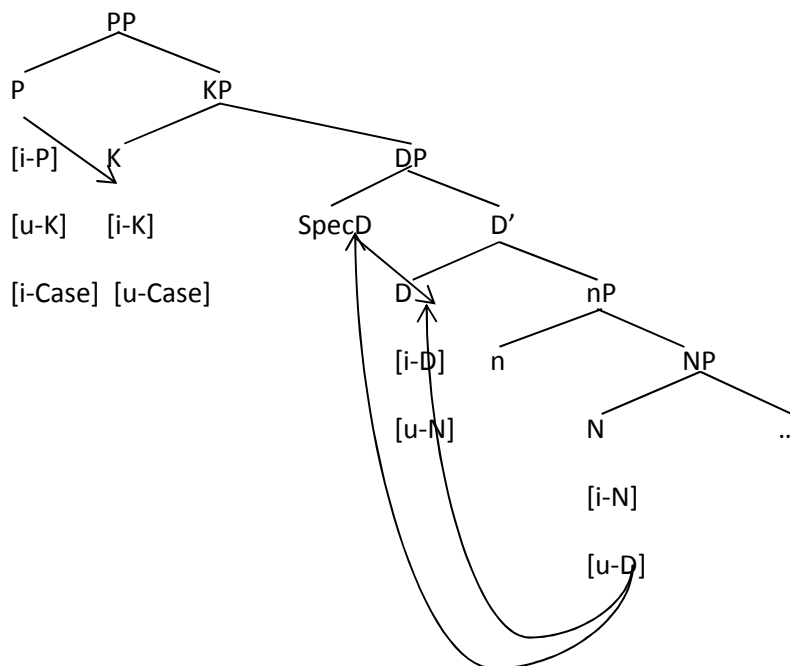
The empirical properties of functional categories in SG can hence be represented thus:

13a) (=chapter 1, section 1.1, ex. 6a))



<sup>63</sup> Subject-agreement (Person) is not mentioned in Cinque's (1999) hierarchy but is commonly assumed to be higher than T (Chomsky (1991:434, 1993:7)), which explains why subject agreement markers tend to come last in the sequence of verbal affixes (Bybee (1985:35)).

13b) (=chapter 1, section 1.1, ex. 6b))

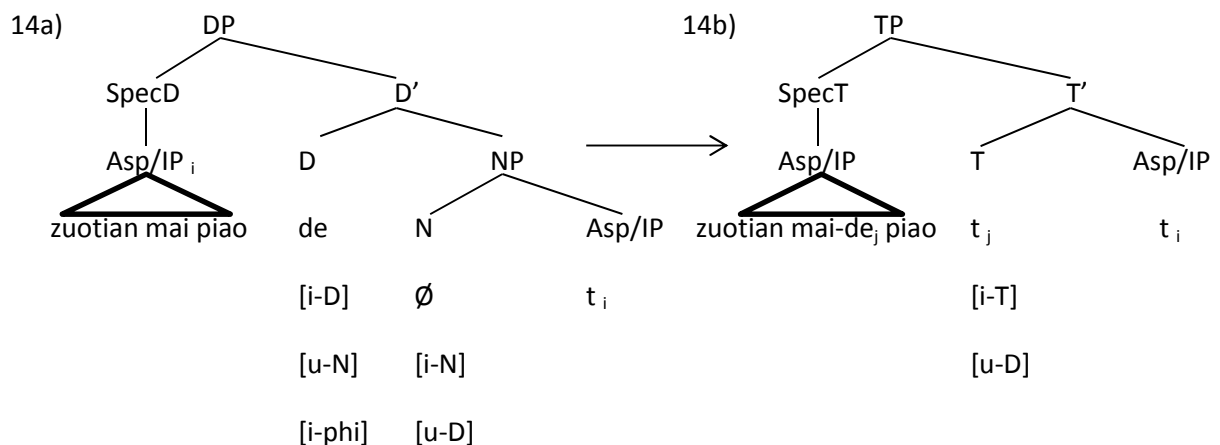


As functional categories (C, M, T in ex. 13a), K and D in ex. 13b)) are universally projected, morphological and lack argument structure, grammaticalizing elements which undergo 'F-attraction' in SG display 'context expansion', rise in frequency and morphophonological weakening. Such are the interface effects of 'F-attraction' (SG). In the next section, I examine those of 'L-shift' (LG).

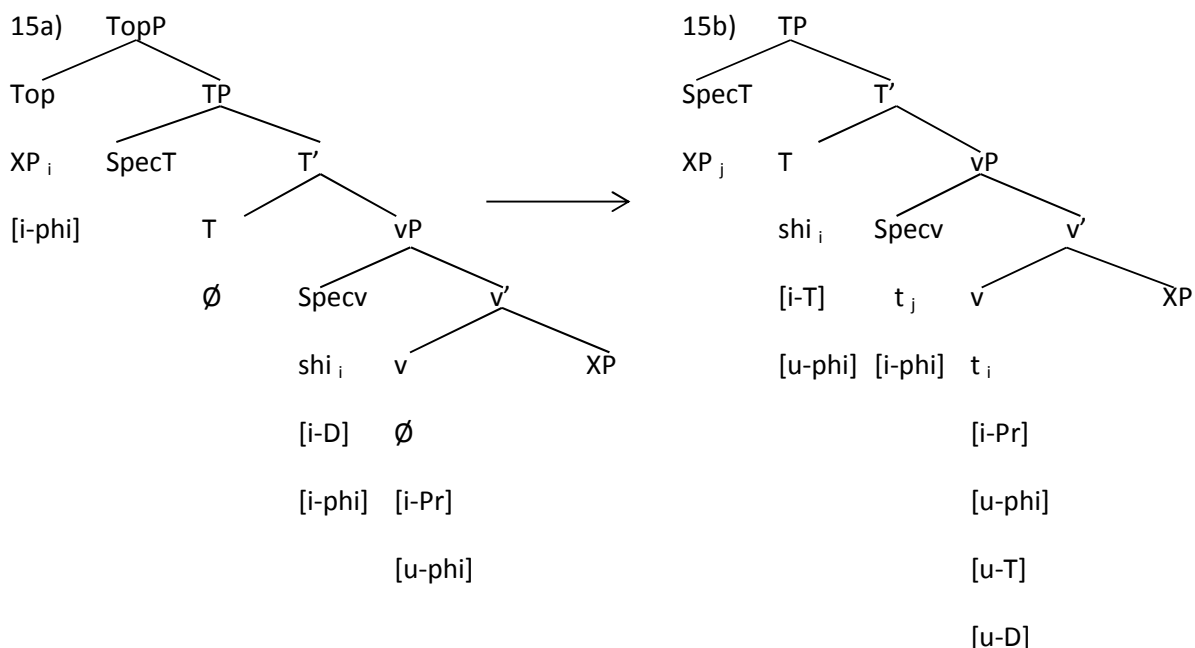
### Section 2.3: 'Lateral shift' and weakening (LG):

In contrast to 'F-attraction' in SG, 'L-shift' in LG creates new functional categories which are not in the original structure:

Chinese *de* (=chapter 1, section 2.4, ex. 9)):



Chinese *shi* (=chapter 1, section 2.4, ex. 10)):



The new functional category (here T) is not part of the universal hierarchy of functional categories and hence imposes very strict restrictions on the distribution of the grammaticalizing elements, which can only be used in certain very specific contexts. In the case of Chinese *de* (ex. 14), the fact that it is re-analysed as a past tense marker ([i-T:past]) entails that it can only be used in cleft sentences which describe past events:

- 16a) wo shi zuotian mai de piao  
I be yesterday buy DE ticket

'It was yesterday that I bought the ticket.' (S&W (2002a:169), Wu (2004:120))

- 16b) \*Ta shi mingtian cai hui qu de Beijing  
He BE tomorrow only-then will go DE Beijing

'It is tomorrow that he will go to Beijing.'

(S&W (2002a:169, 176-177, 190), Wu (2004:126-128, 141))

As *de* can only be used as a verbal suffix (T(past)) in cleft sentences that denote past events (e.g. *zuotian mai-de piao* 'yesterday I bought ticket', ex. 16a)) and not otherwise (e.g. *\*mingtian cai hui qu de Beijing* 'tomorrow I go to Beijing', ex. 16b), cf Lee (2005a: Hole (2011:1713)). There is, therefore, no rise in frequency, since *de* (T(past)) only occurs in a limited number of contexts and cannot be more frequent than the generalised sentence-final *de* (D).<sup>64 65</sup>

<sup>64</sup> Lee (2005a, 2005b) points out some further constraints, namely the fact that *de* (T(past)) can only be used with common compound verbs (ia-b)), indefinite objects (iia-b)), and prosodically 'simple' objects (iiia-b)):



Similarly, although copula verbs derived from subject determiners display ‘F-attraction’ (SpecPred > Pred, ex. 15)), the new T features which are the results of ‘L-shift’ creates subsets of copular constructions which may be morphologically distinct for tense and/or subject agreement (see chapter 1, section 2.3, especially footnote 36) e.g. Hebrew *hu* ‘he’ (i-phi: MASC.3<sup>rd</sup>.SG) > (u-phi:MASC.3<sup>rd</sup>.SG), *hi* ‘she’ (i-phi: FEM.3<sup>rd</sup>.SG) > (u-phi: FEM.3<sup>rd</sup>.SG), *hem* ‘they’ (i-phi:MASC.3<sup>rd</sup>.PL) > (u-phi:MASC.3<sup>rd</sup>.PL), *hen* ‘they’ (i-phi:FEM.3<sup>rd</sup>.PL) > (u-phi:FEM.3<sup>rd</sup>.PL), which show subject-agreement with their respective subjects and are hence only used with the relevant subjects (Gilnert (1989:188-189)):

17a)    ha-sha’on                      hu                      matana

clock.MASC.SG                      COP.MASC.SG    present

‘The clock is a present.’

17b)    ma            hi                      Herut?

What    COP.FEM.SG    freedom.FEM.SG

‘What is freedom?’

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ia)	Ta	shi	zuowan	da	de	jia		
	He	SHI	last.night	beat	DE	fight		
	‘It was last night that he got into a fight.’							
ib)	Ta	shi	zuowan	da	de	ren		
	He	SHI	last.night	beat	DE	person		
	‘It was last night that he beat someone.’							
ic)	*Ta	shi	zuowan	da	de	gou		
	He	SHI	last.night	beat	DE	dog		
	‘It was last night that he beat a dog.’							
iiia)	Ta	shi	zuowan	mai	de	shu		
	He	SHI	last.night	buy	DE	book		
	‘It was last night that he bought a book.’							
iiib)	*Ta	shi	zuowan	mai	de	na	ben	yuyanxue
	He	SHI	last.night	buy	DE	that	CL	linguistics
	‘It was last night that he bought the book ‘Introduction to Linguistics.’							
iiia)	Ta	shi	zai	yushi	li	chang	de	ge
	He	SHI	in	shower	LOC	sing	DE	song
	‘It was in the shower that he sang songs.’							
iiib)	*Ta	shi	zai	yushi	li	chang	de	yi      shou      ge
	It was in the shower that he sang a song.’							
iiic)	*Ta	shi	zai	yushi	li	chang	de	liuxing   ge
	He	SHI	in	shower	LOC	sing	DE	popular song
	‘It was in the shower that he sang popular songs.’							
iiid)	*Ta	shi	zai	yushi	li	chang	de	ABBA   de      dancing queen
	It was in the shower that he sang ABBA’s ‘Dancing Queen’.							

Chinese *de* (T(past)), therefore, has a very limited distribution and is only used in a very small subset of cleft sentences, which severely restricts its frequency (cf Hole (2011:1710ff)).

<sup>65</sup> Although it has been noted that sentence-final *de* (D) is omissible (Lee (2005a:132-138, 2005b:136-137), cf Teng (1979), Tang (1983), Chiu (1993)), it remains the case that *de* (T(past)) is only used in a very small subset of cleft sentences (see previous footnote) and is very unlikely to be more frequent than the generalised *de* (D).

17c)   ma       hem               nimusim?  
          What   COP.MASC.PL   manner.MASC.PL  
          ‘What are manners?’

17d)   éyfo     hen               ha-bahurot?  
          Where   COP.FEM.PL     girl.FEM.PL  
          ‘Where are the girls?’

In addition to subject agreement (ex. 18a-b)), Panare copula forms *kěj*, *něj* also denote tense which correlates with their original deixis as determiners (proximal > present, distal > past, ex. 18c-d)) (Gildea (1993:56-60)):

18a)   maestro        kěj                               měj  
          Teacher       COP.ANIMATE.PROXIMAL       PRO.ANIMATE.PROXIMAL  
          ‘He (animate/proximal) is a teacher.’

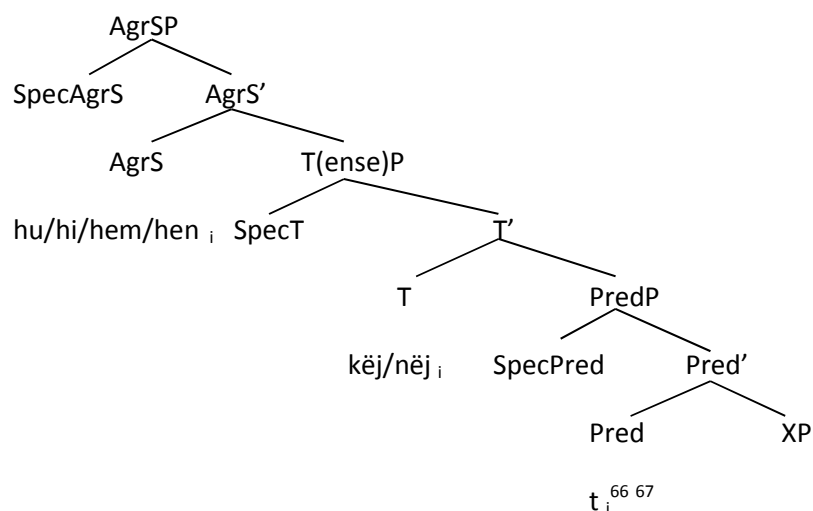
18b)   maestro        něj                               kěn  
          Teacher       COP.ANIMATE.DISTAL        PRO.ANIMATE.DISTAL  
          ‘He (animate/distal) is a teacher.’

18c)   maestro        něj                               měj  
          Teacher       COP.ANIMATE.DISTAL   PRO.ANIMATE.PROXIMAL  
          ‘He (animate/proximal) was a teacher.’

18d)   maestro        kěj                               kěn  
          Teacher       COP.ANIMATE.PROXIMAL       PRO.ANIMATE.DISTAL  
          ‘He (animate/distal) is being a teacher right now.’

These copula forms, therefore, form subsets of copular constructions, which may be represented thus (cf chapter 1, footnotes 36 and 42):

19)



The contexts in which the grammaticalizing elements can occur in LG can be represented thus:

Table 5 (Chinese *de*):

Stage	Meaning	Occurrences
Chinese <i>de</i> (D)	Determiner	All cleft-sentences
Chinese <i>de</i> (T)	Past tense marker	Cleft-sentences which refer to the past (see footnote 64)

<sup>66</sup> In contrast to Hebrew and Panare copulas, Chinese *shi* does not show morphological distinctions of tense or subject agreement and is invariant in all its copular uses. Chinese *shi*, therefore, does undergo 'context expansion' in that it is generalised to all copular constructions, which reflects 'F-attraction' (SpecPred > Pred). This typology of copula verbs derived from subject determiners will be explored in future chapters.

<sup>67</sup> In contrast to copula verbs derived from subject determiners, subject agreement markers derived from subject determiners display 'F-attraction' as they are re-analysed as T (AgrS) elements and hence coalesce with the main finite verb which is already present in the original construction (see chapter 1, section 2.2, footnote 37). They hence undergo 'context expansion', since they are generalised to all finite verbs rather than just to copula verbs (Fuss (2005:chapter 6), and display morphophonological weakening as well e.g. non-standard French subject-agreement markers:

	Standard French		Non-standard French	
	Pre-consonantal	Pre-vocalic	Pre-consonantal	Pre-vocalic
MASC.SG	Il	Il	I	Il
FEM.SG	El	El	E	El
MASC.PL	Il	Ilz	I	Iz
FEM.PL	El	Elz	E	Ez

(Lambrecht (1981:19), cf Ashby (1977:70ff))

- i) Il mang-e et boi-t comme un cochon (standard Fr)  
PRO-3SG eat-PRES.3SG and drink-PRES.3SG like a pig
- ii) I-mange et i-boit comme un cochon (Non-standard French)  
3SG-eat and 3SG-drink like a pig
- 'He eats and drinks like a pig.' (Lambrecht (1981:24))

In ii), the subject-agreement marker is morphophonologically weakened as a prefix to the main verbs (*i-mange et i-boit*), which differs from copula verbs derived from subject determiners.

Table 6 (Hebrew copulas *hu*, *hi*, *hem*, *hen*):

Stage	Meaning	Occurrences
<i>Hu</i> (D)	Personal pronoun (masculine singular) 'he'	Equational constructions with phi-agreeing topic (M.SG)
<i>Hi</i> (D)	Personal pronoun (feminine singular) 'she'	Equational constructions with phi-agreeing topic (F.SG)
<i>Hem</i> (D)	Personal pronoun (masculine plural) 'they'	Equational constructions with phi-agreeing topic (M.PL)
<i>Hen</i> (D)	Personal pronoun (feminine plural) 'they'	Equational constructions with phi-agreeing topic (F.PL)
<i>Hu</i> (T)	Copula	Copular constructions with masculine singular subject
<i>Hi</i> (T)	Copula	Copular constructions with feminine singular subject
<i>Hem</i> (T)	Copula	Copular constructions with masculine plural subject
<i>Hen</i> (T)	Copula	Copular constructions with feminine plural subject

Table 7 (Panare copulas *kěj*, *něj*):

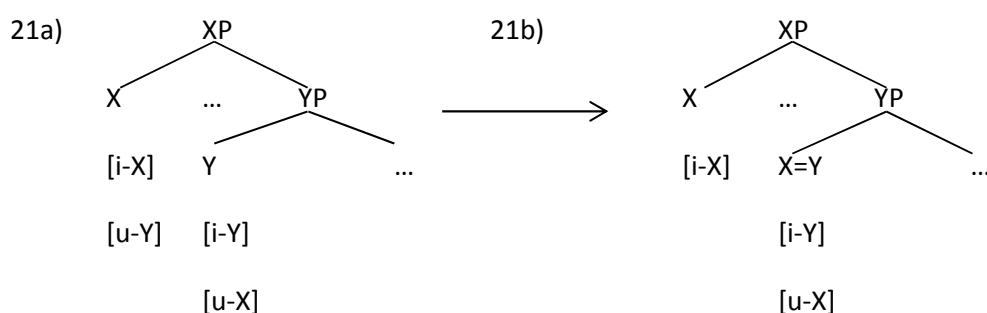
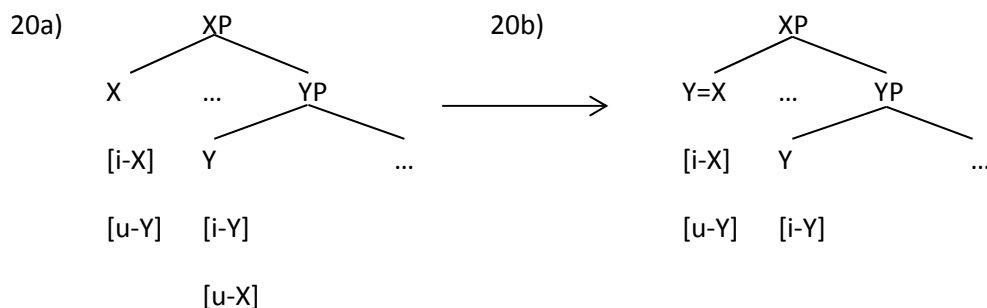
Stage	Meaning	Occurrences
<i>Kěj</i> (D)	Demonstrative (proximal)	Equational constructions with phi-agreeing topic (proximal)
<i>Něj</i> (D)	Demonstrative (distal)	Equational constructions with phi-agreeing topic (distal)
<i>Kěj</i> (T)	Copula	Copula constructions with present time reference
<i>Něj</i> (T)	Copula	Copula constructions with past time reference

'L-shift' in LG, therefore, creates subsets of the original constructions and thereby restricts the number of contexts in which the grammaticalizing element may occur and hence lowers its frequency, which is a sharp contrast to 'context expansion' in SG (see previous section). This will be known as 'context reduction'.

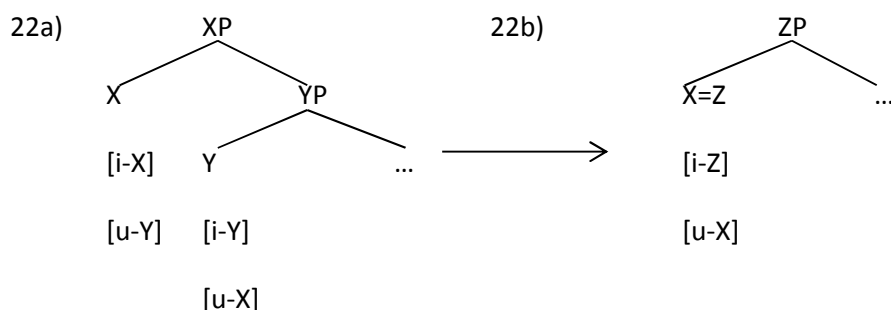
## Section 2.4: 'Functional Spell-Out':

The differences between SG and LG may hence be outlined thus:

SG (=chapter 1, section 1.2, ex. 7-8)):



LG (=chapter 1, section 2.4, ex. 11))



As 'F-attraction' in SG (X=Y in ex. 20b), Y=X in ex. 21b)) entails 'context expansion' (section 2.2) while 'L-shift' in LG (X=Z in ex. 22b)) entails 'context reduction' (section 2.3), the grammaticalizing element can conceivably undergo rise in frequency in the former but not in the latter. Assuming that the interface options of generative syntax are sensitive to usage frequencies (see footnote 59), 'F-attraction' in SG can hence entail morphophonological weakening to the grammaticalizing element whereas 'L-shift' in LG cannot. This will be known as 'Functional Spell-Out', which derives the different frequency and weakening effects of functional categories from their grammaticalization processes (SG/LG).<sup>68</sup> These differences will be explored in later chapters.

<sup>68</sup> This is a significant improvement over simplistic assumptions that functional categories are necessarily weak and are hence not transferred to Spell-Out (Selkirk and Kratzer (2007:125), cf introduction, footnote 2).

### Conclusion:

Bybee's influential theory of weakening in grammaticalization takes frequency to be the underlying cause (section 1), and under her assumptions the formal differences between SG and LG do seem to entail different frequency effects, since while 'F-attraction' in SG entails 'context expansion' (section 2.2), 'L-shift' in LG entails 'context reduction' (section 2.3), which may explain why morphophonological weakening occurs in SG but not in LG (see chapter 1, section 3). The correlation between 'semantic bleaching' and 'phonological weakening'/'univerbation' is hence explained (see footnote 52), and a new model of syntax-phonology interface ('Functional Spell-Out') is proposed (see section 3). In the next chapter, I explore the different frequency and weakening effects of SG and LG by comparing two case studies, namely the grammaticalization of Latin *habere* as the Romance future (SG) and the grammaticalization of Chinese copula *shi* (LG).

### Chapter 3: SG vs LG: the creation of T elements:

As LG (D > T) creates T elements (e.g. Chinese *de* and *shi*, see chapter 1, section 2), I propose to compare it with the grammaticalization of Latin *habere* (V) as the Romance future tense marker (T(future)), which is an example of SG (Roberts (1993a, 2010, 2012), R&R (2002, 2003:chapter 2), cf Tse (2011:introduction, section 3, 2013a:sections 1 and 3)).<sup>69</sup> Furthermore, as the grammaticalization of Latin *habere* goes through an intermediate stage of being a modal verb (V > Mod > T(future)) (Coleman (1971), Fleischman (1982), Pinskter (1985, 1987)), this is a good illustration of ‘primary’ grammaticalization (lexical > functional) and ‘secondary’ grammaticalization (functional > more functional), both of which have been shown to entail rise in frequency and morphophonological weakening to the grammaticalizing element (lexical and functional respectively) (Breban (2014a, 2014b)).<sup>70</sup> LG, in contrast, does not cause any significant rise in frequency or morphophonological weakening to the grammaticalizing element (see chapter 2, section 2.3), and I propose to analyse the grammaticalization of Chinese copula *shi* (D > T), which is a historically well documented change with many cross-linguistic parallels (see e.g. Li and Thompson (1976)).<sup>71</sup> In this chapter, I propose to compare the grammaticalization of Latin *habere* as the Romance future tense marker (SG) and the grammaticalization of Chinese *shi* as a copula verb (LG) with close attention paid to their frequency and weakening effects.

#### Section 1.1: Romance future (SG):

Latin *habere* ‘to have’ is originally a lexical verb which has been re-analysed as a future tense suffix to infinitival stems in Romance (Harris (1978:136ff), Vincent (1988:57)).<sup>72</sup> Furthermore, as

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<sup>69</sup> Indeed, the grammaticalization of Latin *habere* as the Romance future is a famous and well-cited example of grammaticalization (see e.g. Traugott et al (1993:42-44, 2003:42-44)).

<sup>70</sup> Breban (2014a, 2014b) surveys all the definitions of ‘secondary’ grammaticalization and concludes that it, like ‘primary’ grammaticalization, entails (further) rise in frequency and (increased) morphophonological weakening to the (already functional) grammaticalizing element (Breban (2014a:493-498), cf Traugott (2010)). Indeed, formal analyses of ‘secondary’ grammaticalization reveal that the original functional element does undergo ‘F-attraction’ as it is shifted to its associated functional head e.g. French negator *pas* (D > Neg) (R&R (2003:154-161), van Gelderen (2008b:197ff), cf Detges and Waltereit (2002)), English *be*-progressives (Pred > Asp<sub>prog</sub>) (Kranich (2008, 2010a, b)), English determiners (*several* (Adj > Quant), *some* (Adj > Det) (Breban (2008, 2010a, 2010b, 2012)). ‘Primary’ and ‘secondary’ grammaticalization, therefore, can be unified as subtypes of SG, and degrees of functionality can be correlated with the relative levels of frequency and morphophonological weakening of functional elements (cf Kurylowicz (1965:52), Lehmann (1985:305ff, 1995:chapter 4), Hopper and Traugott (1993:7, 2003:7), Traugott and Brinton (2005:99), Norde (2009:20-21, 54-55, 2011:477, 2012:76)).

<sup>71</sup> The historical origins of Chinese *shi-de* constructions, in contrast, are still a matter of debate and the mechanisms which have led to the re-positioning of *de* are as yet unknown (see e.g. Liu (2008), Long (2013), Zhang (2015)). Furthermore, as Chinese *de* is already morphophonologically weak as a determiner (see chapter 1, footnote 43), it is impossible to trace its morphophonological weakening, even if it displays ‘context reduction’ (see chapter 2, section 2.3). Moreover, although the grammaticalization of copula verbs as focus markers is cross-linguistically attested (Heine and Kuteva (2002:95-96, 111-112), cf chapter 1, section 2.2), the categorial re-analysis of Chinese *de* (D > T, see chapter 1, section 2.2) seems to be a language-specific development, as I have yet found no cross-linguistic parallels. In the rest of this dissertation, Chinese copula *shi* will be taken as the representative example of LG, while the grammaticalization of Chinese *de* will be left for future research.

<sup>72</sup> The affixal endings of the Romance future tense paradigm are etymologically related to Latin *habere*, as the Romance future tense endings correspond to the present tense of Latin *habere* and the Romance conditional (future-in-the-past) to the perfect/imperfect tenses of Latin *habere* (Tara (2014:25), cf Coleman (1971:215), Ledgeway (2012:135)):

there is evidence that the Romance future is derived from certain modal uses of Latin *habere* (Benveniste (1968), Fleischman (1982), Raiskila (1990), Adams (1991)), this is a two-stage process (V > Mod > T(future)) which will be analysed in turn.

#### Section 1.2: V 'to have' > Mod:

The earliest example of Latin *habere* being construed with the infinitive occurs in late Republican Latin (1<sup>st</sup> century BC) where the object of *habere* 'to have' is modified by the infinitive denoting modality (Coleman (1971:215), Fleischman (1982:52), Pinkster (1987:205-206)):

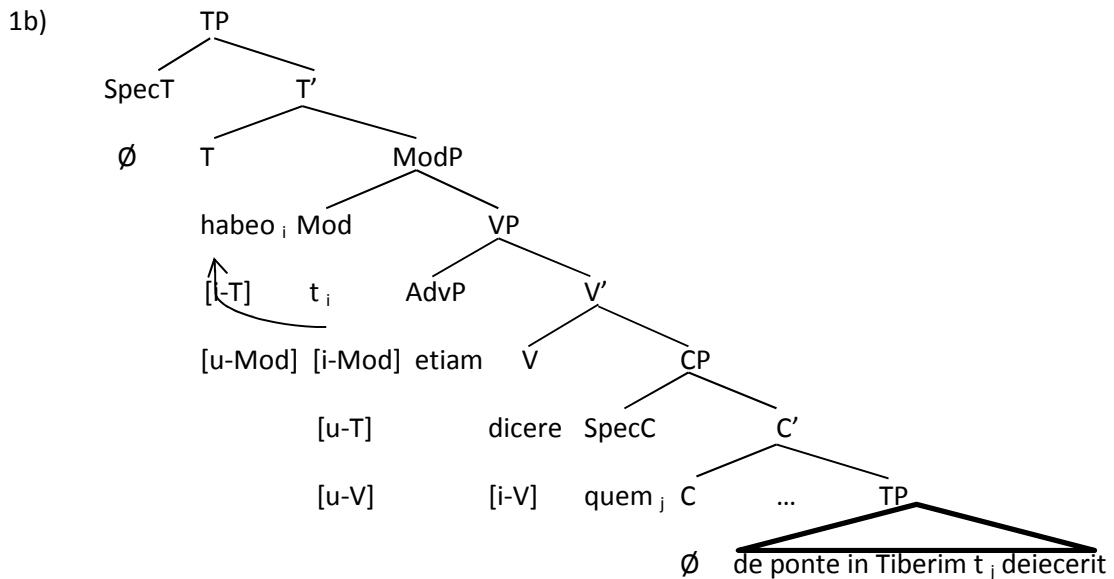
1) hab-eo            etiam   dic-ere            qu-em...            de    pont-e            in  
       have-1SG.PRES even   tell-INF            REL.PRO-ACC.SG from   bridge.ABL.SG   into  
       Tiber-im                    deic-erit.  
       Tiber-ACC.SG   throw.down-3SG.PERF.SUBJ

'I even have an example to say, namely the man whom he threw from the bridge into the Tiber.' (Cicero *Pro S. Roscio Amerino* 100, 80 BC)

Latin	Italian	Spanish	Portuguese	Provençal	French
<i>Cantare habeo</i> (present tense of <i>habere</i> > I shall sing)	<i>Canterò</i>	<i>Cantaré</i>	<i>Cantarei</i>	<i>Chantarai</i>	<i>Chanterai</i>
<i>Cantare habebam</i> (imperfect tense of <i>habere</i> > I would sing)	<i>Canteria</i>	<i>Cantaría</i>	<i>Cantaria</i>	<i>Chantaria</i>	<i>Chanterais</i>
<i>Cantare habui</i> (perfect tense of <i>habere</i> > I would sing)	<i>Canterei</i>	-	-	-	-







1b) is 'simpler' than 1a), since V-to-Mod *Move* is lost and *habere* is shifted upwards from V to Mod via *Merge* (Roberts (1993a:228-229), R&R (2002, 2003:53), cf chapter 2, section 2.1, ex. 9), especially footnote 60). Furthermore, as *habere* is re-analysed as a modal auxiliary verb, its interpretable verbal features become uninterpretable ([i-V] > [u-V]) which hence select the infinitive (*dicere*) as its complement (cf van Gelderen (2011a:chapter 7)).<sup>76</sup> The grammaticalization of Latin *habere*, therefore, displays 'structural simplification' and 'F-attraction' (V > Mod).<sup>77</sup> As Latin *habere* is grammaticalized as a modal verb, it can hence select a wider range of infinitival complements, some of which are previously impossible, namely intransitive and passive infinitives which are first attested in late classical Latin (Coleman (1971:217), Pinkster (1985:198, 1987:207)):

<sup>76</sup> Similar weakening of the object relation of *habere* is attested in the following examples (cf Coleman (1967:216)):

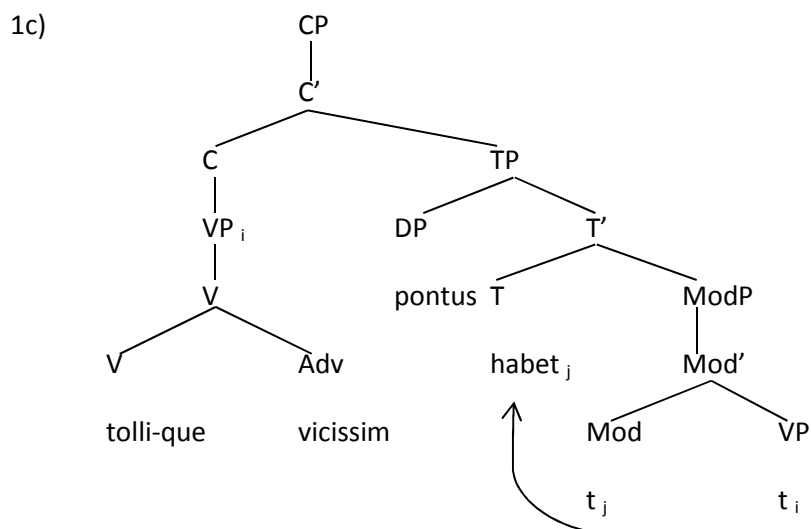
- i) De... somni-is quid hab-e-mus dic-ere?  
 About dream-ABL.PL what HABERE-PRES-1PL say-INF  
 'Regarding dreams, what do we have to say?' > 'Regarding dreams, what can we say?'  
 (Cicero *Academia* 2.136)
- ii) Tantum hab-e-o pollice-ri me tibi  
 so.much HABERE-PRES-1SG promise-INF PRO.1SG.ACC.SG you-DAT.SG  
 absenti tu-is-que praesentibus cumulate  
 absent-DAT.SG your-DAT.PL-and present-DAT.PL absolutely  
 satis facturum  
 enough do- FUT.PART-ACC.SG  
 'I have so much to promise, namely that I shall do absolutely enough for you in your absence and for your people in their presence.' > 'I can so much promise that I shall do absolutely enough for you in your absence and for your people in their presence.' (Cicero *Ad familiares* 1.5.3.1)

As the object of *habere* is either fronted (*quid* in i) or re-analysed (*tantum* in ii)), the object relation of *habere* is weakened, which yields the re-analysis of *habere* as a modal verb.

<sup>77</sup> Two main types of modality have been proposed for Latin *habere*, namely possibility (Mod<sub>Possibility</sub>) and obligation/necessity (Mod<sub>obligation/necessity</sub>) (Thielmann (1885), Bulhart (1926), Coleman (1967:217ff), Pinkster (1985:198-199)). In ex. 1), it is likely that Latin *habere* denotes Mod<sub>Possibility</sub> (*habeo etiam dicere quem...* 'I can even tell you an example...') (Pinkster (1987:206), Tara (2014:237-238)).

1c) toll-i-que                      vicissim                      pont-us                      hab-e-t  
 lift-INF.PASS-and                      repeatedly                      sea-NOM.SG                      HABERE-PRES.3SG

‘... and the sea has to be lifted repeatedly.’ (Valerius Flaccus 1.671-2)



The grammaticalization of Latin *habere* (V > Mod), therefore, can be represented thus (cf chapter 2, tables 3 and 4):

Table 1:

Stage	Meaning	Infinitival complement
Latin <i>habere</i> (V)	‘To have’	Two place predicates with direct object assumed
Latin <i>habere</i> (Mod)	Possibility or Obligation/Necessity (see footnote 77)	All infinitives, including one place predicates like passive and intransitive verbs

Such is the first stage in the grammaticalization of Latin *habere* (V > Mod), which involves ‘structural simplification’, ‘F-attraction’ and ‘context expansion’. This lays the background for the grammaticalization of Latin *habere* as a future tense marker (Mod > T(future)), as will be explored in the next section.

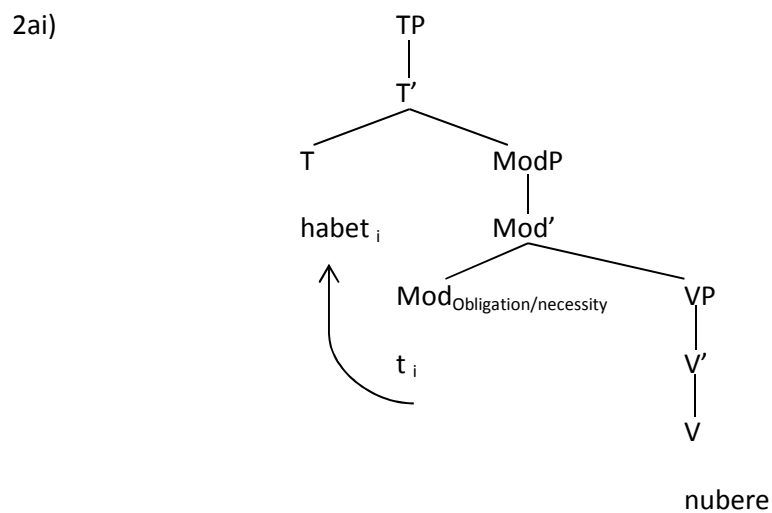
### Section 1.3: Mod > T(future):

The first attestations of Latin *habere* displaying meanings of futurity occur in Tertullian (160-220AD) (Thielmann (1885), Bulhart (1926)) where there are two variants, namely pre-infinitival *habere* (*habere* + infinitive) and post-infinitival *habere* (infinitive + *habere*), and futurity is most evident in examples where *habere* denotes a particular type of obligation/necessity (see footnote 77), namely ‘predestination’ in (Christian) prophecy (Benveniste (1968:89-90), Fleischman (1982:57-58), Raiskila (1990:213)).<sup>78</sup>

<sup>78</sup> It has been argued that post-infinitival *habere* (infinitive + *habere*) is the direct precursor of the Romance future, not only because reflexes of Latin *habere* become verbal suffixes in the Romance future paradigm (see

2a) et ill-a nup-tur-a in domin-o  
 and DEM.PRO-FEM.SG marry-FUT.PART-FEM.SG in lord-ABL.SG  
 hab-e-t nubere  
 have-PRES-3SG marry-INF  
 ‘and she who is about to marry is to marry in the lord.’ (Tertullian, *De monogamia* 7.5)

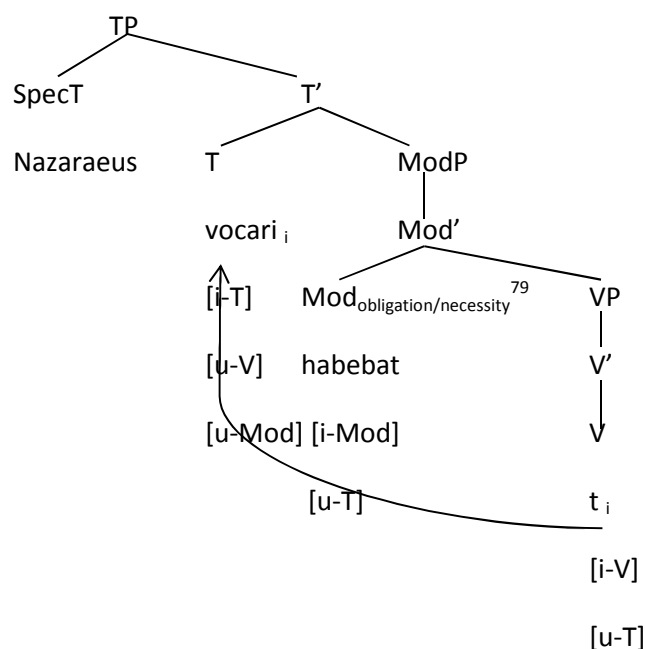
2b) Nazaraeus voca-r-i habe-ba-t  
 Nazaraeus.NOM summon-INF-PASS have-IMPERF-3SG  
 secundum prophetia-m Christus creator-is.  
 According prophesy-ACC Christ creator-GEN.SG  
 ‘Nazaraeus was to be summoned, according to the prophesy of Christ the creator.’  
 (Tertullian, *ad Marcionem* 4.8.1)




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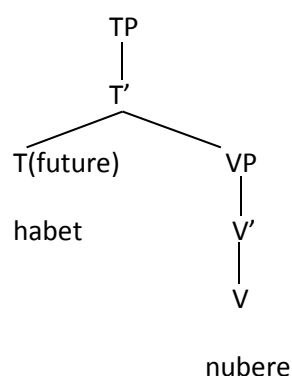
footnote 72), but also because post-infinitival *habere* is particularly associated with ‘predestination’ (Thielmann (1885), Raiskila (1990:213), cf Adams (1991)). Nonetheless, as pre-infinitival *habere* does express futurity in late Latin and medieval Romance, it will be included in my analysis as well.

2bi)



As ‘predestination’ implies no intention or volition on the subject (here *illa* ‘she’ in ex. 2a), *Nazaraeus* in ex. 2b)) and ‘obligation/necessity’ is often predicated on animate/wilful subjects (Fleischman (1982:57-58), cf Bybee et al (1985:63ff)), it is possible to re-analyse these as future tense constructions i.e. ‘she is to marry’ > ‘she will marry’ (ex. 2a)), ‘Nazaraeus was to be called’ > ‘Nazaraeus would be called’ (ex. 2b)):<sup>80</sup>

2a ii)



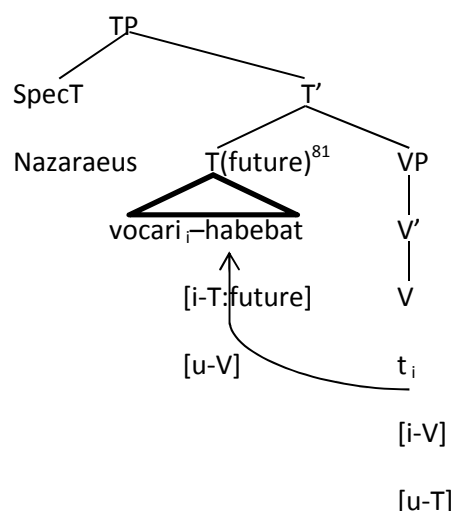
<sup>79</sup> In deriving post-infinitival *habere*, I follow R&R (2002:2003:54-55) in postulating V-to-T *Move* for the infinitive (*vocari* ‘to be called’ in ex. 2b)) which bypasses *habere* in Mod via Long Head Movement (cf Lema and Rivero (1991)). This is supported by the fact that from Tertullian onwards post-infinitival *habere* seems to be a verbal clitic as it is more than often adjacent to the preceding infinitive and is only separated from it by unstressed words (Raiskila (1990:213), cf Adams (1991:161-162)), which suggests that the infinitive is already re-analysed as the main verb and hence undergoes V-to-T *Move*.

<sup>80</sup> This re-analysis can be seen most clearly in examples where *habere* is used in sentences with strict temporal sequences:

- i)      qu-i                      confite-bu-ntur      autem                      in                      Christ-o  
          REL.PRO-NOM.PL      trust-FUT-3PL      however                      in                      Christ-ABL.SG  
          occid-i                      habe-bu-nt                      coram                      hominibus  
          Kill-PASS.INF              HABERE-FUT-3PL                      in.the.presence.of                      man-ABL.PL  
          ‘Those who confide in Christ, however, will be killed openly in the presence of men.’ (Tertullian, *ad Marcionem* 4.28.4)

As the verb in the relative clause has future reference (*confitebuntur* in ex. i)), the verb in the main clause (*occidi-habebunt* in ex. i)) must be interpreted as future (cf Adams (1991:162-163)).

2bii)



2aii) and 2bii) are ‘simpler’ than 2ai) and 2bi) respectively, since while modal *habere* holds an *Agree/Move* relation with T (ex. 2ai), ex. 2bi)), this relation is lost when *habere* is merged in T(future) (ex. 2aii), ex. 2bii)) (R&R (2003:50, 210-211), Roberts (1993a:233-235, 2010:59, 2012:).

Mod<sub>obligation/necessity</sub> is hence eliminated and *habere* is shifted upwards to T(future) where it either becomes a future tense auxiliary verb (ex. 2aii)) or it becomes part of V-to-T *Move* and is hence suffixed onto the main infinitival stem as a future tense ending (ex. 2bii)).<sup>82 83</sup> Latin *habere*, therefore, displays further ‘structural simplification’ and ‘F-attraction’ in the hierarchy of T elements (Mod<sub>obligation/necessity</sub> > T(future)). As ‘predestination’ does not imply volition or intention on the subject, Latin *habere* can hence be used with a wider range of subjects, including inanimate ones:

3a)	ad	futur-am	gloria-m	qu-ae	in	nos
	to	future-FEM.ACC.SG	glory-FEM.ACC.SG	REL.PRO-NOM.SG	into	PRO.1PL

<sup>81</sup> As the Romance conditional (future-in-the-past) also denotes futurity (see footnote 72), past tense reflexes of Latin *habere* are also base-generated in T(future)) and move to a higher functional head (T(past)) where they check past tense features (cf English *is/was going to* + infinitive in chapter 2, ex. 11), especially footnote 62). In my analysis, all reflexes of *habere* as a future tense marker are base-generated in T(future).

<sup>82</sup> Technically, post-infinitival *habere* is the subject agreement marker (AgrS) for the Romance future tense paradigm, since it marks person endings rather than the tense ending of the Romance future (Fleischman (1982:71), cf Belletti and Rizzi (1996:6), R&R (2002:42, 2003:52)):

French:

- i) chante-r-ai  
sing-FUT-HABERE.1SG  
‘I shall sing’

Italian:

- ii) ame-r-ò  
love-FUT-HABERE.1SG  
‘I shall love’

Nonetheless, as *habere* is part of the Romance future tense paradigm, it is marked as T(future) here for clarity.

<sup>83</sup> As *habere* as a future tense marker can be used with modal verbs, its original interpretable Mod features may have become uninterpretable ([i-Mod] > [u-Mod]), which conforms to van Gelderen’s ‘Feature Economy’ (cf chapter 1, section 1.1, ex. 5)). As there is no modal verb in ex. 2), [u-Mod] is subsumed within [u-V] as part of the selectional property of *habere* in T(future).

hab-e-t            revel-ar-i

have-PRES-3SG reveal-INF-PASS

‘to the future glory which will be revealed (*habet revelari*) to us.’

(Tertullian, *de resurrectione carnis* 40.86.16)

3b)    in        nation-ibus        a        qui-bus                    magis

in        nation-ABL.PL    by        REL.PRO-ABL.PL        most

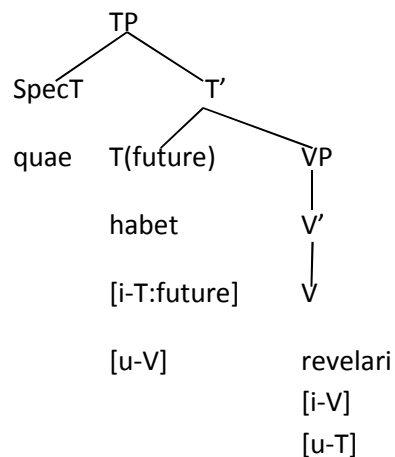
suscip-i                    habe-bat

accept-INF.PASS        HABERE-IMPF.3SG

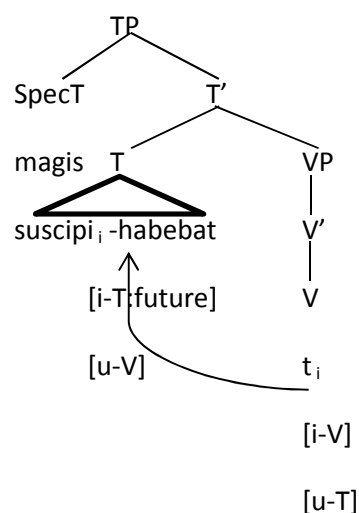
‘Among the nations by which most would be accepted (*suscipi-habebat*).’

(Tertullian *Adversus Marcionem* 9.9)

3a)



3b)



The grammaticalisation of Latin *habere* as a future tense marker (Mod<sub>Obligation/Necessity</sub> > T(future)), therefore, entails further ‘context expansion’ as it is used with a wider range of subjects. Furthermore, while the use of Latin *habere* as a future tense marker has a limited distribution in late

Latin (Coleman (1967:222)),<sup>84</sup> it becomes fully generalised in Romance as the default future tense paradigm:

Medieval Spanish:

3c)      yr-emos            a            Valencia,            ser-emos            a            las            bodas  
             Go-FUT.1PL      to            Valencia            be-FUT.1PL      at            the            wedding

‘We shall go to Valencia and we shall be at the wedding.’ (*El Poema del Mio Cid* 2161)

The final stages in the grammaticalization of Latin *habere* (Mod<sub>obligation/necessity</sub> > T(future)), therefore, can be represented thus:

Table 2:

Stage (type frequency)	Meaning	Subject	Infinitival complement
Latin <i>habere</i> (Mod)	Obligation/Necessity	Animate/human agents	All lexical verbs
Latin <i>habere</i> (T(future))	Future	All subjects	All lexical verbs in certain morphosyntactic contexts (see footnote 84)
Medieval Romance (T(future))	Future	All subjects	All lexical verbs

The grammaticalization of Latin *habere* as the Romance future, therefore, shows successive instances of ‘structural simplification’ and ‘F-attraction’ in the cartographic hierarchy of T elements (V > Mod<sub>Obligation/Necessity</sub> > T(future)), which has given rise to progressive ‘context expansion’ and rise in frequency to the grammaticalizing element (Latin *habere*) (see tables 1 and 2). This entails morphophonological weakening to Latin *habere*, which will be explored in the next section.

#### Section 1.4: morphophonological weakening of Latin *habere*:

Morphophonological weakening is apparent in the grammaticalization of Latin *habere* as the Romance future, since while Latin *habere* (V) ‘to have’ is an autonomous word, it becomes a verbal suffix in the Romance future tense paradigm (see footnote 72), the earliest evidence for which is attested in the 6<sup>th</sup> century AD (Fleischman (1982:68)):

<sup>84</sup> It has been observed that the use of Latin *habere* as a future tense marker is mainly restricted to morphosyntactic contexts where the classical Latin tense paradigm is defective, namely passive infinitives and future-in-the-past (Coleman (1971:221-224), Fleischman (1982:36-40, 55-56)). Latin *habere* is hence not fully generalised as the default future tense marker until medieval Romance where the Latin morphological future becomes obsolete (Fleischman (1982:40-43)).



- 4a)      ill-e                      responde-ba-t:              non      da-b-o  
             PRO-MASC.SG.NOM      reply-IMPERF-3SG              NEG      give-FUT-1SG  
             Iustinian-us              dice-ba-t:              dar-a-s  
             Iustinianus-NOM.SG      say-IMPERF-3SG              give-FUT-2SG
- ‘He used to reply: I shan’t give it. Iustinianus used to say: you will give it.’
- (*Fredegar’s Chronicle*, c. 613 AD).

Latin *habere* is here fused with the infinitival stem in forming the future tense (*dar-as* ‘you will give’) and is used in correspondence with the Latin morphological future (*dabo* ‘I shall give’) (Coleman (1971:230), Fleischman (1982:68), Adams (1991:160-161)). Furthermore, there is evidence for an intermediate stage where *habere* is a post-infinitival clitic, since from Tertullian onwards post-infinitival modal *habere* is more than often adjacent to the preceding infinitive and is only separated from it by unstressed words (Raiskila (1990:213), cf footnote 79).<sup>85 86</sup>

- 4b)      dar-i              enim      ha-be-bat              circumcisio  
             Give-PASS.INF      for      HABERE-IMPERF-3SG      circumcision
- ‘For circumcision would be given...’ (Tertullian *Adversus Iudaeos* 3.4)

The various stages in the grammaticalization of Latin *habere* as the Romance future can, therefore, be summarised thus:

<sup>85</sup> This anticipates ‘mesoclitization’ in certain dialects of medieval Romance and contemporary European Portuguese where reflexes of Latin *habere* are also only separated from the main infinitival stem by unstressed pronouns (Beardsley (1921:26ff)):

Medieval Spanish:

- i)      el rey      quere-r-me-ha              por      amigo  
             the king      want-INF-me-HABERE      for      friend  
             ‘The king will want me for a friend.’ (*El Poema del Mio Cid* 76)

<sup>86</sup> Cf Hopper and Traugott (1993:7, 2003:7) and Norde (2009:8, 2011:477, 2012:76) who postulate the following morphological cline for the grammaticalization of verbs (cf Zwicky (1985), Zwicky and Pullum (1983), Ramat (1987:8-13)):

- i)      lexical verb > grammatical auxiliary > clitic auxiliary > inflectional tense affix

It is a cross-linguistic trend that tense markers tend to be affixal while modal auxiliaries periphrastic (Bybee et al (1987, 1989, 1991, 1994)). More will be said about this in the next chapter.

Table 3:

Stage (type frequency)	Meaning	Subject	Infinitival complement
Latin <i>habere</i> (V) (word)	‘To have’	Animate/human agents	Two place predicates with direct object assumed
Latin <i>habere</i> (Mod) (pre-infinitival auxiliary, post-infinitival clitic) <sup>87</sup>	Possibility, Obligation/Necessity	Animate/human agents	All lexical verbs
Latin <i>habere</i> (T(future)) (verbal suffix)	Future	All subjects	All lexical verbs in certain morphosyntactic contexts (see footnote 84)
Medieval Romance (T(future)) (verbal suffix)	Future	All subjects	All lexical verbs

Such is the grammaticalization of Latin *habere* as the Romance future (SG), which shows a gradation of frequency levels and morphophonological weakening. In the next section, I analyse the grammaticalization of Chinese copula *shi* (LG).

#### Section 2.1: Chinese *shi* (LG):

In chapter 1, section 2.3, I argue that the grammaticalization of Chinese copula *shi* displays ‘structural simplification’ and ‘F-attraction’ in that the *Agree* relation between the subject determiner *shi* in SpecPred and Pred is lost and the subject determiner is re-analysed as a copula in Pred (see chapter 1, section 2.3, especially footnote 30). Furthermore, it is argued that as Chinese *shi* is grammaticalized as a copula verb, it gains new T features which are previously absent and hence qualify as ‘L-shift’ (see chapter 1, section 2.3, especially footnotes 29 and 36):

<sup>87</sup> There is evidence from Ibero-Romance that post-infinitival *habere* is morphophonologically weakened whereas pre-infinitival *habere* is not:

- i)        quando        Coymbria        a-v-ie        se-er        presa  
               when        Coimbra        HABERE-IMPERF-3SG        be-INF        taken  
               ‘When Coimbra was about to be taken...’ (*La Primera Crónica General* 487b47)
- ii)        busca-r        nos        ie        el        rey        Alfonsso  
               search-INF        us        HABERE-IMPERF-3SG        the        king        Alfonsso  
               ‘King Alfonso would look for us.’ (*El Poema del Mio Cid* 528)

'To see the king after travelling a thousand miles, this (is) what I want.' (5a) >

'To see the king after travelling a thousand miles is what I want.' (5b))

(Mencius, 4<sup>th</sup> century BC) (=chapter 1, section 2.3, ex.10)



5b)

Qian li er jian wang j

[i-phi]

shi i

[i-T]

[u-phi]

Specv

t j

v

t i

[i-Pr]

[u-phi]

[u-T]

[u-D]

NP

wo suo yu ye

Section 2.2: SpecPred &gt; Pred:

<sup>88</sup> The topics used with Chinese *shi* in Old Chinese are invariably 3<sup>rd</sup>-person but may vary in number (singular/plural), since both singular and plural topics are attested in equational constructions (Feng (1993, 2003)):

In i), as there are more than one element in the topic (*fu yu gui* 'wealth and nobility'), it must be analysed as plural (*shi* 'these (things)'). This number distinction also applies to clausal topics, which can also be plural (Feng (1993:290, 2003:33)):

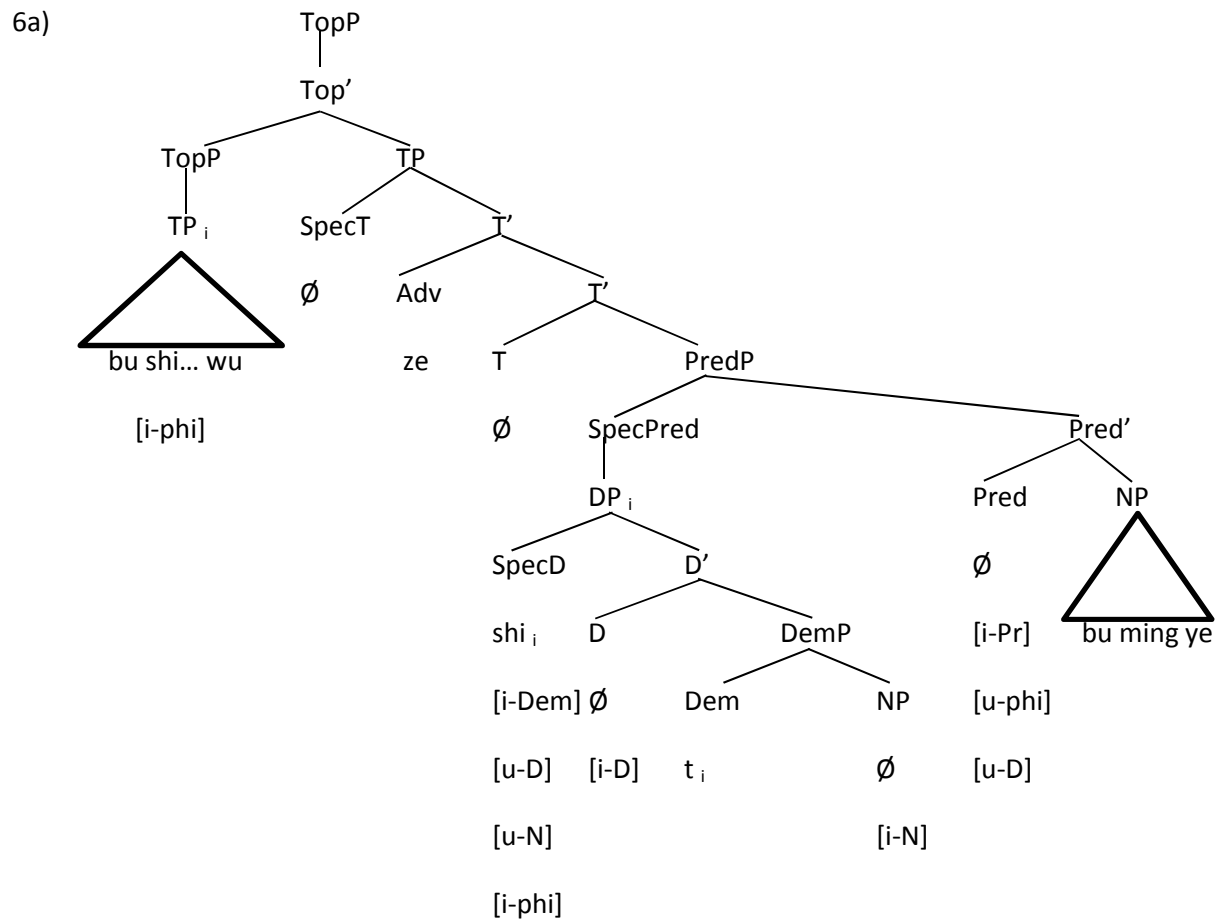
Old Chinese *shi*, therefore, shows number distinctions in its phi-agreement with its topic. More will be said about this below.

6)      bu      shi      wang   zhi      bu      keyi   wei   tang   wu  
          NEG   know   king   DET   NEG   can   with   Tang   fight  
          Ze      shi      bu      ming   ye  
          ADV   this   NEG   clear   DECLARATIVE.PARTICLE

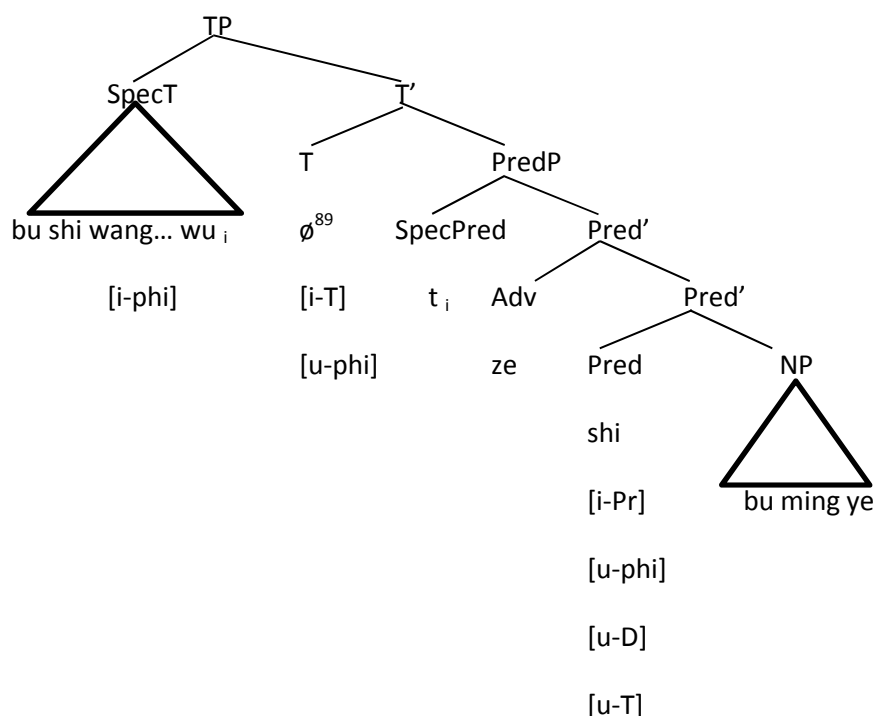
‘Not knowing the king and so not being able to fight with Tang, this (is) not clear indeed.’ (6a))

>

‘Not knowing the king and so not being able to fight with Tang is not clear indeed.’ (6b)) (Mencius)



6b)



As Old Chinese *ze* is ambiguous between being a conjunction (6a)) and an adverb (6b)) (Feng (1993:282-283, 2003:31)), Chinese *shi* can either be analysed as a subject (6a)) or a copula verb (6b)).<sup>90</sup> Furthermore, as Chinese *shi* is not clause-initial in ex. 6), it is better analysed as a copula verb in Pred (6b)).<sup>91</sup> As Chinese *shi* is re-analysed as a copula verb (Pred), it selects a wider range of subjects, some of which are previously impossible, namely demonstrative pronouns and non-3<sup>rd</sup> person subjects (Li and Thompson (1976:425-426), Peyraube and Wiebusch (1994:396-397), Feng (1993:, 2003:31-35), see footnote 88)).<sup>92</sup>

<sup>89</sup> As the adverb *ze* precedes *shi*, *shi* should not undergo overt movement to T but remain in Pred. Nonetheless, the *Agree* relation between *shi* in Pred and T remains undisputed (cf chapter 1, section 2.3, footnote 36).

<sup>90</sup> Indeed, Ancient Chinese *shi* can precede *ze*, in which case *shi* must be analysed as the subject in SpecPred and *ze* an adverb within PredP (Feng (1993:283, 2003:28-29)):

i)      Xun        wei        fa        yu        tianxia    ke        chuan    yu  
           Xun        use        law        in        world    can        spread   to  
           Houshi    wo        you        weimian        wei        xiang    ren    ye  
           Posterity   I        but        unfortunately   be        country   man   DECLARATIVE.PARTICLE  
           Shi        ze        ke        you        ye  
           This        ADV    can        worrying        DECLARATIVE.PARTICLE  
           'The fact that Xun is imposing the law on the world, it can spread to posterity, but I am  
           lamentably still a countryman, this (is) worrying indeed.' (Mencius, 5<sup>th</sup> century BC)

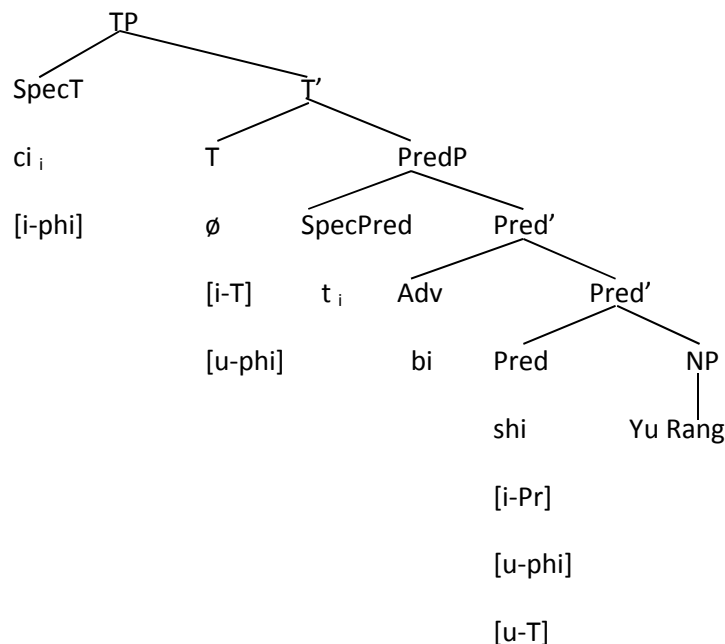
<sup>91</sup> This analysis is supported by the fact that in later Chinese Adv-*shi*-Predicate order becomes increasingly frequent and eventually ousts *shi*-Adv-Predicate order entirely (Feng (1993:283ff, 2003:31ff), Peyraube and Wiebusch (1996:397), cf previous footnote).

<sup>92</sup> It has been suggested that *shi* has already been grammaticalized as a copula verb by the time of Mencius, since it already shows predicate inversion and hence must be analysed as copula verbs (Chang (2006:148ff)):

8a) Ci bi shi yu rang ye  
 This definitely SHI Yu Rang DECLARATIVE.PARTICLE

‘This must be YuRang.’ (*Shi Ji: Ci Ke Liezhuan*, Yu Rang, c. 1<sup>st</sup> BC)

8a)



- 
- i) De xing Wu di, sheng zi yi ren,  
 Obtain favour Wu emperor bear son one person  
 Zhao di shi ye  
 Zhao emperor SHI PRT  
 ‘She won the favour of the Wu emperor, and gave birth to a son, who is the Zhao emperor (*Zhao di shi ye*).’ (*Shi Ji* 1<sup>st</sup> BC)

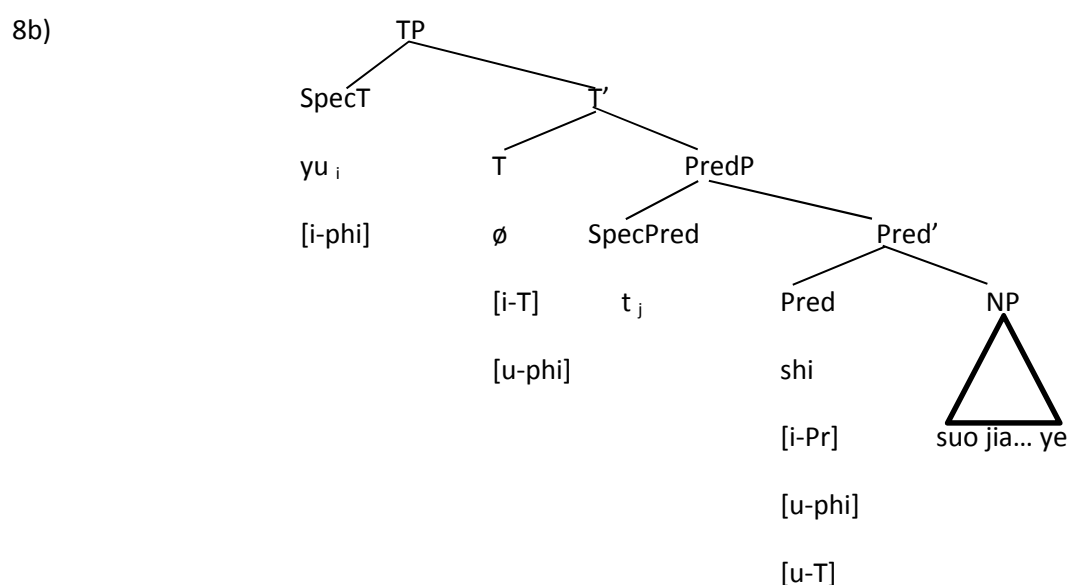
In fact, the *terminus ante quem* may even be pushed back to the Qin Dynasty (3<sup>rd</sup> century BC), since there are non-literary examples of *shi* that are unambiguously copular (Peyraube and Wiesbusch (1996:397-398), Feng (2003:35), cf Xi (1978), Qiu (1979)):

- i) shi shi lie gui  
 SHI SHI fierce ghost  
 ‘This is a fierce ghost.’ (*Shuihudi Qin my zhujian*, 180-170 BC)

As *shi* is doubled here and it selects itself as the subject, it must be analysed as a copula verb, which suggests that the grammaticalization of *shi* has already happened, at least in the contemporary vernacular (Peyraube and Wiesbusch (1994:398), Feng (2003:35 footnote 1)). The retention of clause-initial *shi* in later literary texts is hence argued to be literary conservatism (Feng (2003:35 footnote 1)). The co-existence of old and new forms in grammaticalization will be discussed in future chapters.

8b)      yu      shi      suo              jia      fu              ren  
             I        SHI      RELATIVISER   marry female        person  
             zhi                      fu      ye  
             POSSESSIVE.PARTICLE   father   DECLARATIVE.PARTLCE

'I am the father of the bride to be.' (*Lunheng*, p. 427, c. 100 AD)



'F-attraction' in the grammaticalization of Chinese copula *shi* (SpecPred > Pred), therefore, entails 'context expansion', since *shi* comes to be used with a wider range of subjects (ex. 12)), which can be represented thus:

Table 4:

Stage	Meaning	Complement
Subject determiner (D in SpecPred)	Demonstrative pronoun 'this' in subject position	Topics which show phi-agreement (3 <sup>rd</sup> -person) (see footnote 88)
Copula verb (Pred)	Copula verb	All subjects

As Chinese copula *shi* shows movement/agreement with T (see chapter 1, section 2.3, especially footnote 36), it displays 'L-shift' and is hence used with different types of subjects and tenses, which creates subsets of copular constructions, as will be seen in the next section.

### Section 2.3: Pred > T:

The uses of Chinese *shi* as a copula verb is most evident in Medieval Chinese where it becomes increasingly obligatory in copular constructions and begins to show tense and subject-agreement distinctions (cf Wang (1958:35, 347ff)), as it is used with subjects of different persons and different temporal adverbs which denote different tenses:



9a) wo shi ni de fang zhuren

I SHI you POSSESSIVE.MARKER room master

'I am your housemaster.'

(Yulin waishi, Bing jiaren qinglou suanming dai mingshi jiguan xianshi)

9b) ci yu shi xiri xia he

this jade SHI formerly name CONJ

yu jingshang zhi xia

at mountain.jing POSSESSIVE.MARKER below

Jian fenghuang qi yu shi shang,

See phoenix rest at rock above

Dai er jin zhi zhuwenwang

Bring CONJ bestow PRO name

'This jade is the thing which formerly Xia, when he, below the Mountain Jing, saw a phoenix on a rock, and brought it as a gift for Zhuwenwang.' (Sanguo yanyi)<sup>93</sup>

These tense/subject-agreement distinctions denote T features which are new to the construction and hence qualify for 'L-shift' (see chapter 1, section 2.3), and since these denote subsets of all copular constructions, they restrict the distribution of the copula verb, which, in other languages, shows morphological distinctions of subject-agreement and tense (e.g. Panare and Hebrew, see chapter 2, section 2.3, exs. 17-19)). 'L-shift', therefore, creates subsets of copular constructions and hence entails 'context reduction', which may be represented thus:

Table 5:

Stage	Meaning	Complement
Copula verb (Pred)	Copula verb	All subjects
Subject agreement (T)	Copula verb	Subjects of different persons
Tense (T)	Copula verb	Tenses of copula verb

<sup>93</sup> As Chinese has very few tense markers, tense is pragmatically inferred from context, which, in the case of ex. 9b), is indicated by the adverb *xiri* 'formerly' (T(past)).

The diachronic distribution of Chinese *shi*, therefore, can be represented thus (cf Tables 4 and 5):

Table 6:

Stage	Meaning	Complement
Subject determiner (D in SpecPred)	Demonstrative pronoun ‘this’ in subject position	Topics which show phi-agreement (3 <sup>rd</sup> -person)
Copula verb (Pred)	Copula verb	All subjects
Subject agreement (T)	Copula verb	Subjects of different persons
Tense (T)	Copula verb	Tenses of copula verb

The grammaticalization of Chinese copula *shi*, therefore, entails both ‘context expansion’ (table 4) and ‘context reduction’ (table 5), since although ‘F-attraction’ (SpecPred > Pred) entails that *shi* is used with a wider range of subjects and hence raises its frequency (section 2.2), ‘L-shift’ (Pred > T) creates subsets of copular constructions (subject-agreement and/or tense) (section 2.3), which are morphologically distinguished in numerous languages (see chapter 2, section 2.3). ‘F-attraction’ (SpecPred > Pred), therefore, raises the frequency of Chinese *shi*, whereas ‘L-shift’ lowers the frequency of the various subsets of copular elements, which may have prevented the morphophonological weakening of the various copula forms in question. These frequency effects will be explored in later chapters.

#### Conclusion:

The differences between the grammaticalization of Latin *habere* as the Romance future (SG) and Chinese *shi* as a copula verb (LG), therefore, are that while ‘F-attraction’ in SG gives rise to ‘context expansion’, rise in frequency and morphophonological weakening to the grammaticalizing element (section 1), ‘L-shift’ in LG creates subsets of the original construction and hence gives rise to ‘context reduction’, lowering of frequency, and no morphophonological weakening to the grammaticalizing element (section 2.3). ‘Secondary’ grammaticalization and ‘lateral’ grammaticalization hence form minimal pairs (see introduction, especially footnote 70), since while the former involves ‘F-attraction’ and raises the frequency of an already functional element, the latter involves ‘L-shift’ and lowers it. In the next chapter, I shall analyse the cross-linguistic parallels to these two case-studies, since they both constitute strong cross-linguistic trends (see e.g. Heine and Kuteva (2002:108-109, 116, 218, 235, 242-244)).

#### Chapter 4: typological patterns of morphophonological weakening in SG and LG:

As morphophonological weakening in grammaticalization is noted to be probabilistic rather than absolute (Campbell (2001:121-122), cf Lessau (1994:263), Heine (1994:109)), it is important to analyse all the attested cross-linguistic examples of SG and LG and examine their typological patterns of morphophonological weakening statistically (cf Tse (2011:conclusion, 2012:conclusion)). As my case studies of SG (Latin *habere* as the Romance future (V > Mod<sub>Obligation/Necessity</sub> > T(future), see chapter 3, section 1) and LG (Chinese copula *shi* (D > Pred/T), see chapter 3, section 2) constitute cross-linguistically robust trends (Tse (2011:section 3.2, 2013a:104-110, 2013b:102-106)), I propose to present all the attested cross-linguistic parallels and analyse their degrees of morphophonological weakening individually.<sup>94</sup>

##### Section 1.1: V ‘to have’ > Mod<sub>Obligation/Necessity</sub> > T(future):<sup>95</sup>

As the grammaticalization of Latin *habere* as the Romance future is analysed in two stages (V ‘to have’ > Mod<sub>Obligation/Necessity</sub> > T(future), see chapter 3, section 1), I propose to analyse them separately and present cross-linguistic examples for each stage.

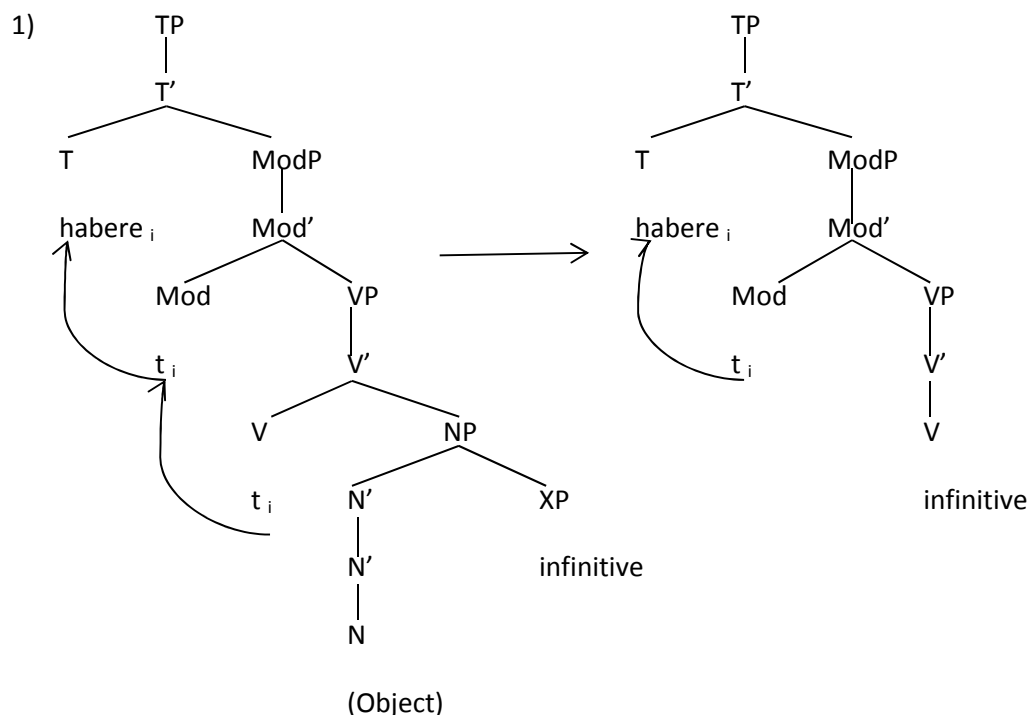
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<sup>94</sup> In Tse (2011:section 5.2, 2012:section 2.4, 2013a:113-114, 2014:96-97), I argue that while cross-linguistic examples of grammaticalization undergo ‘structural simplification’ (cf chapter 1, footnote 5), their discourse and communicative patterns (i.e. ‘cues’, see chapter 1, footnote 7) are also strikingly similar, which leads to the conclusion that formalism (‘structural simplification’) and functionalism (‘discourse/communicative patterns’) are not only not mutually exclusive but also mutually complementary in the cross-linguistic distribution of grammaticalization (Tse (2011:section 5.2, 2013a:113-114, 2014:96-97)). In analyzing cross-linguistic parallels of SG and LG, therefore, I propose to present typological examples that can be shown to have undergone the same mechanisms of re-analysis as my case-studies. This is important, since it has been argued that the same categorial changes in syntactic change need not involve the same mechanisms of re-analysis (van Kemenade and Vincent (1997:20)) e.g. Germanic demonstratives (Dem) > articles (D) (Philippi (1997)), which have been argued to involve different mechanisms of re-analysis from the grammaticalization of Latin demonstratives (Dem) as Romance articles (D) (Vincent (1997)), despite being categorically the same (Dem > D) (cf Tse (2011:section 2.8) where I similarly argue that the grammaticalization of prepositional complementisers can involve different mechanisms of re-analysis). It is hence important to even out the differences between my cross-linguistic parallels by ensuring that they have undergone the same mechanisms of re-analysis and are hence likely to display similar frequency and weakening effects. Furthermore, in my collection of cross-linguistic examples, I have followed Bybee’s methodology of using reference grammars and published sources and have communicated with native speakers wherever possible (Bybee et al (1989:54, 1990:4, 1994:27ff)). Moreover, as it has been argued that in order to be typologically significant and representative, cross-linguistic surveys should be typologically and phylogenetically unbiased (cf Perkins (1980), who collects an unbiased cross-linguistic sample of fifty languages (cf Voegelin and Voegelin (1966)), I have endeavoured to present as many cross-linguistic examples as possible, though given the nature of the cross-linguistic trends, it is not always possible to present more than a dozen (see sections 2-3 below).

<sup>95</sup> This is by no means the only cross-linguistic pathway which leads to the genesis of future tense markers, as there are other well-attested cross-linguistic pathways as well e.g. verb ‘to go’ (Bybee et al (1987:110ff, 1991:29ff, 1994:266-268)), verb ‘to want’ (Bybee et al (1987:110ff, 1994:254-257)), temporal adverbs (Bybee et al (1994:270-271), Heine and Kuteva (2002:299)). In this section, I focus solely on cross-linguistic examples which directly parallel the grammaticalization of Latin *habere* as the Romance future, namely V ‘to have’ > Mod<sub>Obligation/necessity</sub> > T(future) (see chapter 3, section 1), which is a cross-linguistically robust trend (Bybee et al (1987:110-112, 114-116, 1991:22-29, 1994:181-187, 258-264))

### Section 1.2.1: V 'to have' > Mod:<sup>96</sup>

In chapter 3, section 1.2, I argue that the grammaticalization of Latin *habere* 'to have' (V) as a modal verb (Mod) originates from constructions where *habere* selects an object modified by an infinitive implying modality (see chapter 3, section 1.2, ex. 1a), especially footnote 73), and *habere* is re-analysed as a modal verb when its object relation is omitted/weakened and it comes to select the infinitive as its complement (see chapter 3, section 1.2, ex. 1b), especially footnotes 74-76):



This re-analysis entails 'context expansion' and consequent rise in frequency, since Latin *habere* comes to select a wider range of infinitives which are previously impossible, namely passive/intransitive infinitives (see chapter 3, section 1.3, ex. 1c)). In this section, I present cross-linguistic examples which have undergone the same re-analysis and analyse their patterns of morphophonological weakening.

### Section 1.2.2: cross-linguistic examples (V 'to have' > Mod):

#### 2) English *have to* + infinitive:

English *have to* + infinitive originates from constructions where *have* selects an object modified by the *to*-infinitive implying modality (Denison (1993:316-317), Fischer (1994:140ff, 1997), in Fischer (1994:142)):

<sup>96</sup> Lexical verb 'to have' is not the only lexical source for the grammaticalization of modal verbs, as there are other lexical sources as well (e.g. lexical verb 'to owe' (Bybee et al (1994:181-187))), and modal verbs are not the only outcome of the grammaticalization of lexical verb 'to have' (e.g. *Asp<sub>Perfect</sub>* (Heine and Kuteva (2002:245))). In this section, I focus solely on this particular cross-linguistic pathway (V 'to have' > Mod), which directly parallels the first stage in the grammaticalization of Latin *habere* as the Romance future (cf chapter 3, section 1.2).

2a) þu hefdest clað to weri-en  
 You had clothes to wear.INF

‘You had clothes to wear.’ (Lamb. Hom. 33)

Re-analysis occurs when the object of the verb ‘to have’ is postposed to after the infinitive, which gives rise to modal interpretations of *have to*, namely obligation/necessity (Fisher (1994:146ff)):

2b) Þat he hefde to iwiten; seouen hundred scipen  
 So.that he had to guard-INF seven hundred ships

‘... so that he had to guard seven hundred ships.’ (M1 NN HIST LAYBR I, in Fischer (1994:149))

Re-analysis is confirmed by examples where *have to* selects an intransitive/passive infinitive (Denison (1993:317)), which entails ‘context expansion’:

2c) Gramaire ferste hath forto teche to speke upon congruite  
 Grammar first has to teach to speak about congruity

‘Grammar has first to teach how to speak about congruity.’

(Gower, CA 7.1530, in Denison (1993:317))

In modern English, *have to* is primarily used forms of *have to* + infinitive are morphophonologically weakened as *hafta*, *hasda* (Fleischman (1982:58-59), Krug (2000:53ff)).

### 3) German *haben zu*:

German *haben zu* ‘have to’ + infinitive has been reanalysed as a modal periphrasis expressing obligation and is compatible with all verbs, including intransitive and passive ones (Heine and Kuteva (2002:244), cf Jager (2010)):

3a) er hat ein Auto.

He has one car

‘He has a car.’

3b) er hat zu gehorchen

He has to obey

‘He has to obey.’ (Heine and Kuteva (2002:244))

As far as I can find, there is no morphophonological weakening.<sup>97</sup>

<sup>97</sup> I am grateful to one German native speaker for confirming the lack of morphophonological weakening in German *haben zu* + infinitive.

#### 4) Latin *habere*:

Latin *habere* 'to have' + infinitive originates from constructions where *habere* selects an object modified by the infinitive implying modality, and re-analysis occurs when the object relation is either omitted or weakened and *habere* denotes either possibility or obligation/necessity (see chapter 3, section 1.2, especially footnotes 74-77):

- 4a)    hab-eo            etiam    dic-ere            qu-em...            de    pont-e            in  
          have-1SG.PRES even    tell-INF            REL.PRO-ACC.SG from    bridge.ABL.SG    into  
          Tiber-im                    deic-erit.  
          Tiber-ACC.SG    throw.down-3SG.PERF.SUBJ

'I even have an example to say, namely the man whom he threw from the bridge into the Tiber. > 'I even have to say whom he threw from the bridge into the Tiber.' (Cicero *Pro S. Roscio Amerino* 100, 80 BC)

Re-analysis is confirmed when *habere* selects intransitive/passive infinitives, which entails 'context expansion' (see chapter 3, section 1.2, ex. 1c)):

- 4b)    toll-i-que                    vicissim            pont-us            hab-e-t  
          lift-INF.PASS-and            repeatedly            sea-NOM.SG    HABERE-PRES-3SG

'... and the sea has to be lifted repeatedly.' (Valerius Flaccus 1.671-2)

There is morphophonological weakening here, as Latin *habere* is a clitic in post-infinitival contexts (infinitive + *habere*) and continues to be so in Medieval Ibero-Romance and modern European Portuguese (see chapter 3, section 1.4, especially footnotes 79 and 85):

Medieval Spanish:

- 4c)    dez-ir            vos    he                    la    verdad  
          tell-INF            you.PL    HABERE.PRES.1SG            the    truth

'I shall tell you the truth.' (*El Poema del Mio Cid* 947)

Modern European Portuguese:

- 4d)    dar-me-as  
          give-me-have.PRES.2SG  
          'You will give it to me.' (Modern European Portuguese, in Adams (1991:163))

#### 5) Netherhollands CD *ha fo*:

Netherhollands CD *ha fo* 'have' + infinitive is re-analysed as a modal periphrasis expressing obligation and is compatible with all verbs, including intransitive and passive ones (Stolz (1987:175)):

5a)    Mi        sa        ha        fo        loo  
        I         FUT     have    PART   go

‘I will have to go.’ (Stolz (1987:175))

There is morphophonological weakening here, as in the present tense Negerhollands CD *ha fo* + infinitive can be shortened as *fo* + infinitive (Stolz (1987:175)).

6) Nyabo *ble*:

Nyabo *ble* ‘to have’ also expresses obligation (Marchese (1986:138-140)):

6a)    ɔ         ble     ye        bo        tɔɔ     ni  
        He       have    ?        COMP   buy     fish

‘He must buy fish.’ (Marchese (1986:140))

As far as I can find, no morphophonological weakening is attested.

7) Romance *habere/tenere*:

In Western Romance languages, the lexical verb ‘to have’ (< Latin *habere* ‘to have’) is construed with prepositional infinitives to express obligation and is compatible with all lexical verbs, including intransitive and passive ones (Fleischman (1982:73)):

French *avoir a* + infinitive:

7a)    J’ai                    a        travaill-er  
        I-have.1GS        AD        work-INF  
        ‘I have to work.’

Italian *avere da* + infinitive:

7b)    H-o                    da        cant-are  
        have-PRES.1SG    DA        sing-INF  
        ‘I have to sing.’

Spanish *haber de* + infinitive:

7c)    H-e                                    de        cant-ar  
        Have-PRES.1SG                    DE        sing-INF  
        ‘I have to sing.’<sup>98</sup>

<sup>98</sup> Such a wide geographical distribution suggests proto-Romance origins, and Tara (2014:345-346)) proposes an example in late Latin of *habere* + *ad* + gerundive:

Furthermore, in Ibero-Romance, the two lexical verbs ‘to have’ (< Latin *tenere* ‘to hold’, *habere* ‘to have’) can also be construed with a complementiser + infinitive in denoting obligation:

Spanish *tener que* + infinitive:

7d)	Nin	ten-e-mos	pan	que	com-er
	Neither	have-PRES-1PL	bread	COMP	eat-INF
	Njn	otr-a	cosa		njngun-a
	Neither	other-FEM.SG	thing.FEM.SG		none-FEM.SG

‘We do not have bread or any other thing to eat.’

(12<sup>th</sup> century Spanish, in *General estoria, Primera Parte*)

7e)	Para	descargo	de	su	conciencia
	For	relief	of	POSS.3SG	conscience
	Tien-e	que	haz-er	una	denuncia
	Has-PRES.3SG	COMP	do-INF	a	report

‘To relieve his conscience he has to make a report.’

(18<sup>th</sup> century Spanish, *Documentos Lingüísticos de la Nueva España, Altiplano central*)

Spanish *hay que* + infinitive:

7f)	Hay	que	hac-er-lo	mañana
	HABERE	COMP	do-INF-it	tomorrow

‘We have to do it tomorrow.’ (Batllori et al (2009:445)).

As far as I can find, there is no morphophonological weakening here.

#### 8) Yoruba *ní*:

In Yoruba, the lexical verb *ní* ‘to have’ is construed with the infinitive to express obligation and is compatible with all lexical verbs, including intransitive and passive ones (Welmers (1973:341-342)):

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i)	Pet-ens	ut	sigrecius	quod
	Beg-PRES.PART	COMP	in.confidence	REL.PRO.N.SG
	Ad sugger-end-um		habe-ba-t	expon-ere-t
	AD add-GERUNDIVE-N.SG		HABERE-IMPERF-3SG	explain-IMPERF.SUBJ-3SG
	‘... asking him to explain in confidence what he had to add.’ (Fredegar, <i>Chronicle</i> 51)			



8a) Mo ni bata  
I have shoes  
'I have shoes.'

8b) Mo ni l'ati lo  
I have to go  
'I have to go.' (Welmers (1973:341-342))

As far as I can find, there is no morphophonological weakening here.

Such is the grammaticalization of lexical verb 'to have' (V) > obligative modal (Mod<sub>obligation/necessity</sub>), which may be summarised thus:

Table 1:

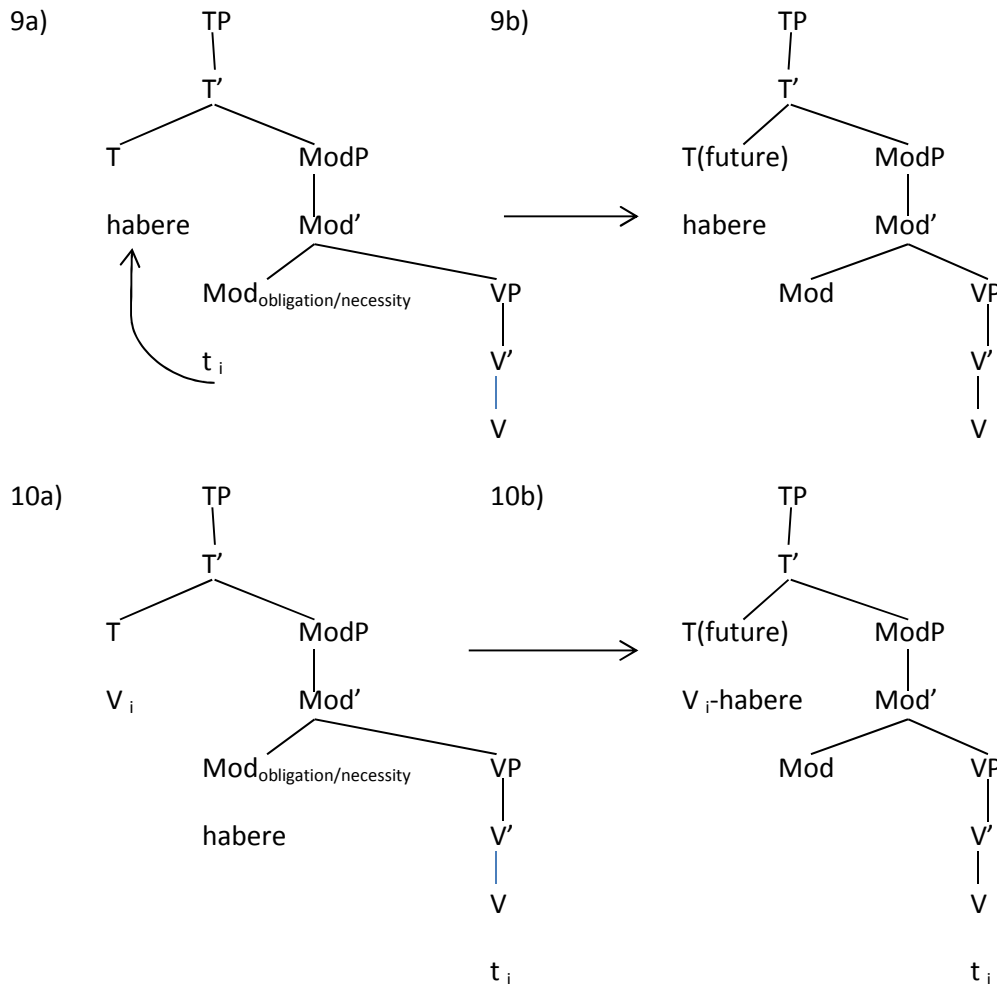
Language	Pre-grammaticalized category	Post-grammaticalized category	Morphophonological weakening
English <i>have to</i> + infinitive (ex. 2))	Lexical verb 'to have'	Mod <sub>obligation/necessity</sub>	<i>Hafta</i> (< <i>have to</i> ) <i>Hasda</i> (< <i>has to</i> )
German <i>haben zu</i> + infinitive (ex. 3))	Lexical verb 'to have'	Mod <sub>obligation/necessity</sub>	-
Latin <i>habere</i> + infinitive/infinite + <i>habere</i> (ex. 4))	Lexical verb 'to have'	Mod <sub>Possibility</sub> /Mod <sub>obligation/necessity</sub>	Infinitive + <i>habere</i> (clitic)
Negerholland <i>ha fo</i> + infinitive (ex. 5))	Lexical verb 'to have'	Mod <sub>obligation/necessity</sub>	<i>Fo</i> + infinitive
Nyabo <i>ble</i> + infinitive (ex. 6))	Lexical verb 'to have'	Mod <sub>obligation/necessity</sub>	-
Romance <i>habere/tenere</i> + prepositional infinitive (ex. 7))	Lexical verb 'to have'	Mod <sub>obligation/necessity</sub>	-
Yoruba <i>ni</i> + infinitive (ex. 8))	Lexical verb 'to have'	Mod <sub>obligation/necessity</sub>	-

Of all the cross-linguistic examples, the following show morphophonological weakening: English *hafta/hasda* + infinitive (ex. 1)), Latin *habere* (ex. 3)), and Negerholland CD (*ho*) *fa* + infinitive (ex. 4)). Such is the cross-linguistic distribution of verb 'to have' > Mod<sub>obligation/necessity</sub>. In the next section, I analyse the cross-linguistic distribution of Mod<sub>obligation/necessity</sub> > T(future).

### Section 1.3.1: Mod<sub>obligation/necessity</sub> > T(future):

In chapter 3, section 1.3, I argue that the grammaticalization of Latin *habere* as a future tense marker originates from its use as a modal verb denoting a particular type of obligative modality, namely 'predestination'/'prediction', and there are two variants of this construction,

namely pre-infinitival *habere* (*habere* + infinitive, see chapter 3, section 1.3, ex. 2ai)) and post-infinitival *habere* (infinitive + *habere*, see chapter 3, section 1.3, ex. 2bi)), the former of which becomes an auxiliary verb (see chapter 3, section 1.3, ex. 2aii)) while the latter becomes a verbal affix (see chapter 3, section 1.3, ex. 2bii)):



This re-analysis entails ‘context expansion’ and consequent rise in frequency, since Latin *habere* as a future tense marker selects a wider range of subjects, some of which are previously impossible, namely inanimate subjects (chapter 3, section 1.3, ex. 3)).<sup>99</sup> Furthermore, in Romance reflexes of Latin *habere* become the default future marker of the future tense paradigm (chapter 3, section 1.3, ex. 3c)). In this section, I present cross-linguistic examples which have undergone the same re-analysis and analyse their morphophonological weakening.

<sup>99</sup> This re-analysis and ‘context expansion’ from an agent-oriented meaning (e.g. Mod<sub>Obligation/Necessity</sub>) to a non-agentive meaning (e.g. T(future)) is indeed a cross-linguistic trend (Bybee et al (1985:66ff, 1987:109ff, 1991:19ff)).

### Section 1.3.2: cross-linguistic examples (Mod<sub>obligation/necessity</sub> > T(future)):

#### 11) Germanic *\*skal*:

In Germanic languages, the proto-Germanic obligative modal *\*skal* has been grammaticalized as future tense markers in modern Scandinavian and Germanic languages via an intermediate stage of ‘prediction’ (Bybee et al (1987:114-, 1991:26-27, 1994:258-259), Dahl (2000:319-320)).<sup>100</sup>

Danish *skal*:

- 11a) Du skal gå nu  
you AUX go now

‘You must go now.’ (Bybee et al (1994:259))

English *shall*:

- 11b) ... and I shall get to London as soon as I can

(Bybee et al (1987:114-1991:26-27), cf Visser (1969:1581-1582, 1601ff))

Swedish *skall*:

- 11c) Vart ska du åka?  
whither shal you.SG go.INF

‘Where will you go?’ (Dahl (2000:313))

Morphophonological weakening is attested, namely in Swedish *ska* (*skall* > *ska*) and English *shall*, which is often pronounced as [ʃə] (R&R (2003:226)).

#### 12) Icelandic *munu*:

Icelandic future tense marker *munu* is derived from an originally obligative modal verb *\*mun* (Thrainsson (2007:15-17)):

- 12a) María mun koma  
Mary FUT come.INF

‘Mary will come.’ (Thrainsson (2007:15))

As far as I can find, there is no morphophonological weakening here.

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<sup>100</sup> In contrast to Latin *habere*, Germanic obligative modal *\*skal* is derived from a lexical verb ‘to owe’, which is another common lexical source for obligative modals (Bybee (1994:182-187)).

### 13) Italian dialects:

In certain southern Italian dialects and Sardinian, *avere* 'to have' is construed with a prepositional infinitive to express future tense, which can be seen as an extension of the obligative use of this construction (Dahl (2000:325), cf section 2.1, ex. 6)):

- 13a)   av-em                               a           cantà  
           HABERE-PRES.1PL       AD       sing  
       'We shall sing.' (Abruzzesse, in Ledgeway (2012:135))

As far as I can find, there is no morphophonological weakening here.

### 14) Latin *habere*:

Latin *habere* expresses futurity in (proto-)Romance and it originates from a modal periphrasis which expresses obligative modality via an intermediary stage of 'prediction' (cf section 2.2.1, ex. 4)):

- 14a)   ad       futur-am                   gloria-m                   qu-ae                   in       nos  
           to       future-FEM.ACC.SG   glory-FEM.ACC.SG REL.PRO-NOM.SG   into   PRO.1PL  
           hab-e-t            revel-ar-i  
           have-PRES-3SG reveal-INF-PASS  
       'to the future glory which will be revealed (*habet revelari*) to us.'  
       (Tertullian, *de resurrectione carnis* 40.86.16) (cf chapter 3, section 1.2, ex. 3a))

- 14b)   in       nation-ibus       a       qui-bus                   magis  
           in       nation-ABL.PL   by   REL.PRO-ABL.PL       most  
           suscip-i                   habe-bat  
           accept-INF.PASS       HABERE-IMPF.3SG  
       'Among the nations by which most was to be accepted > would be accepted (*suscipi-habebat*).'  
       (Tertullian *Adversus Marcionem* 9.9) (cf chapter 3, section 1.2, ex. 3b)):

In all modern Romance languages, post-infinitival *habere* is morphophonologically weakened as a verbal suffix (see chapter 3, section 1, especially footnotes 72 and 87):<sup>101</sup>

<sup>101</sup> In contrast, pre-infinitival *habere* does not show any morphophonological weakening (see chapter 3, section 1.4, footnote 87).

Italian:

- 14c) cante-r-ò  
Sing-FUT-1SG  
'I shall sing.'

French:

- 14d) chante-r-ai  
Sing-FUT-1SG  
'I shall sing.'

Spanish:

- 14e) canta-r-é  
Sing-FUT-1SG  
'I shall sing.'

15) Slave *góʔo*:

Slave future tense marker *góʔo* is derived from its use as an obligative modal auxiliary (Bybee et al (1994:259)):

- 15a) kie ráyehdi goʔo  
shoes buy must  
'I must buy shoes.'

- 15b) wohje goʔo  
sing will  
'I will sing.'

As far as I can see, there is no morphophonological weakening here.

Such is the cross-linguistic distribution of the grammaticalization of modal auxiliaries as future tense markers, which may be tabulated thus:

Table 2:

Language	Pre-grammaticalized category	Post-grammaticalized category	Morphophonological weakening
Germanic * <i>skal</i> + infinitive (ex. 11))	Mod <sub>obligation/necessity</sub>	T(future)	English <i>shall</i> [ʃəl] Swedish <i>skall</i> > <i>ska</i>
Icelandic <i>munu</i> + infinitive (ex. 12))	Mod <sub>obligation/necessity</sub>	T(future)	-
Italian dialects <i>avere</i> + <i>a</i> + infinitive (ex. 13))	Mod <sub>obligation/necessity</sub>	T(future)	-
Latin <i>habere</i> + infinitive/infinitive + <i>habere</i> (ex. 14))	Mod <sub>obligation/necessity</sub>	T(future)	Infinitive- <i>habere</i> (affix)
Slave <i>go?o</i> + infinitive	Mod <sub>obligation/necessity</sub>	T(future)	-

Morphophonological weakening is hence attested in the following examples: English *shall*, Swedish *ska* and Latin *habere* (ex. 12)).

### Section 1.3.3: cross-linguistic examples (V > (Mod) > T(future)):

In addition to the examples in the previous sections, there are various cross-linguistic examples where the future tense marker is etymologically related to the lexical verb ‘to have’ and the intermediate stage of modality has been putatively reconstructed:

#### 16) Bulgarian *ima da* + infinitive:

Bulgarian future tense marker *ima da* + infinitive is etymological related to *ima* ‘to have’ (Heine and Kuteva (2002:243)):

16a)    *toj*        *ima*                      *kniga*

He        have.PRES.3SG book

‘He has a book.’

16b)    *ima*                                      *da*        *xodja*

Have.PRES/3SG                      PART    go.IMPERF.PRES.1SG

‘I will go.’ (Heine and Kuteva (2002:243))

There is morphophonological weakening in the negative *njamam* ‘have not’ + *da* > *njama da*:

16c)    *njama*                      *da*        *dades*

Have.not                      PART    give.PERF.PRES.2SG

‘You will not give.’ (Heine and Kuteva (2002:243))

17) Kru *ka/ka*:

In Eastern Kru languages, the future tense marker is etymologically related to the lexical verb 'to have' (Marchese (1979, 1986:133ff)).<sup>102 103</sup>

Godié:

17a)   ɔ           kʌ       monfi

He       have   money

'He has money.' (Marchese (1986:76))

17b)   ɔ           kʌ       sʌ       pi

He       have   down   lie

'He will lie down.' (Marchese (1986:76))

There is morphophonological weakening here, as these future auxiliary forms all undergo tone change (Marchese (1986:141-142)).

18) Ukrainian *-im-*:

The Ukrainian future tense inflection *-im-* is etymologically related to *imati* 'to have' (Dahl (2000:319)):

18a)   pisatime

write.FUT.3SG

'He will write.' (Dahl (2000:319))

There is morphophonological weakening here, as reflexes of *imati* are suffixed onto the main verbal stem.

Such is the cross-linguistic distribution of lexical verb 'to have' > (Mod<sub>obligation/necessity</sub>) > future tense marker:

<sup>102</sup> A list of such etymological correspondences is given as such (Marchese (1986:76, 133)):

	Neyo	Godié	Lakota Dida	Vata	Bété	Koyo
Lexical verb 'to have'	Ka	kʌ	Ká	Ká	kʌ	Ka
Future tense marker	Ka	kʌ	Ká	Ka	kʌ	ka

<sup>103</sup> An intermediate obligative stage is reconstructed since in one particular language (Neyo), *ka* can be used to denote obligation, as is the case in numerous other Kru languages (Marchese (1986:76)):

Table 3:

Language	Pre-grammaticalized category (lexical verb (V) 'to have')	Post-grammaticalized category (future tense marker (T(future)))	Morphophonological weakening
Bulgarian (ex. 16))	<i>Ima da</i> + infinitive	<i>Ima da</i> + infinitive	<i>Njama</i> (< <i>njamam</i> ) <i>da</i> + infinitive
Kru * <i>ka</i> (ex. 17))	Lexical verb 'to have'	Future tense marker	<i>Ka</i> (tone change)
Ukrainian <i>imati</i> (ex. 18))	Lexical verb 'to have'	Future tense marker	- <i>im</i> -

Morphophonological weakening is attested in Bulgarian *njama da* (14)) and Ukranian –*im*- (15)).

#### Section 1.4: V 'to have' > Mod > T(future):

In sum, all the cross-linguistic examples of V 'to have' > Mod > T(future) surveyed in this section can be summarised thus (cf Tables 1, 2, 3):

Table 4:

Language/example	Lexical verb (V) 'to have'	Modal verb (Mod)	Future tense marker (T(future))	Morphophonological weakening
English <i>have to</i> + infinitive (ex. 2))	<i>Have</i>	<i>Have to</i> + infinitive	-	<i>Hafta/hasda</i> + infinitive
German <i>haben zu</i> + infinitive (ex. 3))	<i>Haben</i>	<i>Haben zu</i> + infinitive	-	-
Latin <i>habere</i> + infinitive/infinitive + <i>habere</i> (exs. 4, 14))	<i>Habere</i>	<i>Habere</i> + infinitive/infinitive + <i>habere</i>	<i>Habere</i> + infinitive/infinitive + <i>habere</i>	Infinitive + <i>habere</i> (modal clitic) Infinitive + <i>habere</i> (future affix)
Negerholland <i>ha fo</i> + infinitive (ex. 5))	<i>Ha</i>	<i>Ha fo</i> + infinitive	-	<i>Fo</i> + infinitive
Nyabo <i>ble</i> + infinitive (ex. 6))	<i>Ble</i>	<i>Ble</i> + infinitive	-	-
Romance <i>habere/tenere</i> + prepositional infinitive (ex. 7))	French <i>avoir</i> Italian <i>avere</i> Spanish <i>tener</i> , <i>hay</i> Portuguese <i>ter</i>	<i>Avoir</i> + <i>a</i> + infinitive <i>Avere</i> + <i>da</i> + infinitive <i>Tener/hay</i> + <i>que</i> + infinitive	-	-
Yoruba <i>ni</i> (ex. 8))	<i>Ni</i>	<i>Ni</i> + infinitive	-	-
Germanic * <i>skal</i> (ex. 11))	-	English <i>shall</i> + infinitive Danish <i>skol</i> + infinitive Swedish <i>skall</i> + infinitive	English <i>shall</i> + infinitive Danish <i>skol</i> + infinitive Swedish <i>skall</i> + infinitive	English <i>shall</i> [ʃəl] Swedish <i>ska</i>
Icelandic <i>munu</i> (ex. 12))	-	<i>Munu</i> + infinitive	<i>Munu</i> + infinitive	-



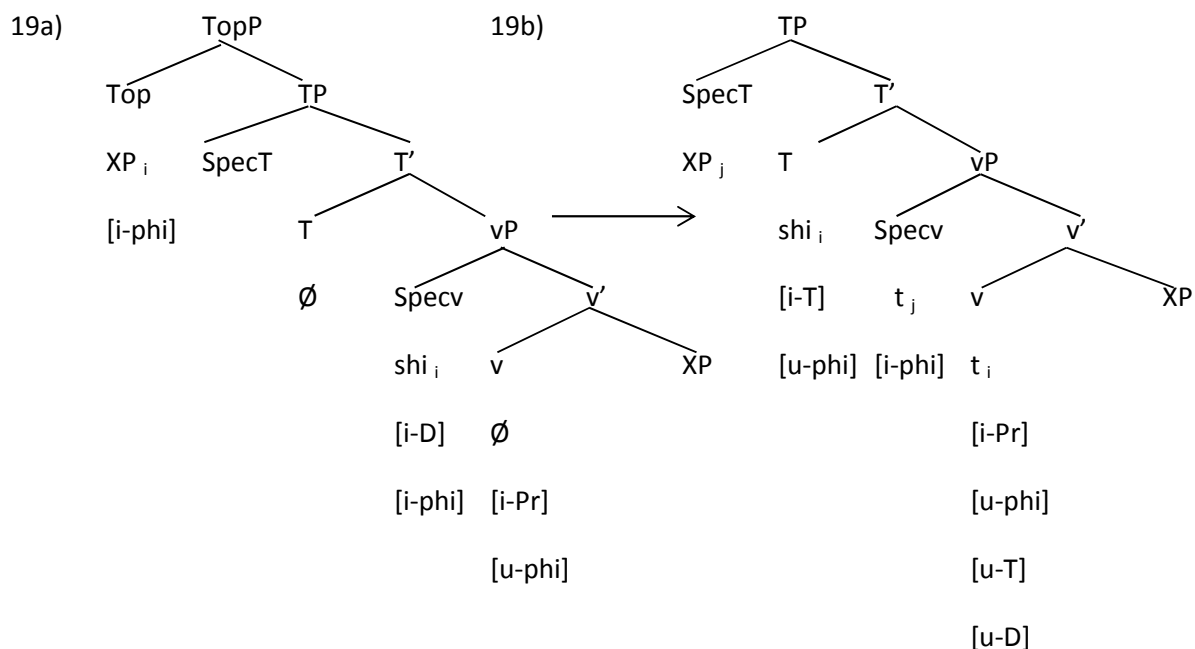
Italian dialects (ex. 13))	-	<i>Avere + a + infinitive</i>	<i>Avere + a + infinitive</i>	-
Slave (ex. 15))	-	<i>Go?o + infinitive</i>	<i>Go?o + infinitive</i>	-
Bulgarian <i>ima da + infinitive</i> (ex. 16))	<i>ima</i>	-	<i>Ima da + infinitive</i>	<i>Njama (&lt;njamam) da + infinitive</i>
Kru <i>*ka</i> (ex. 17))	<i>Ka/kɛ</i>	-	<i>Ka/kɛ + infinitive</i>	<i>Ka/kɛ</i> (tone change)
Ukrainian <i>-im-</i> (ex. 18))	<i>Imati</i>	-	<i>infinitive-im-</i>	<i>-im-</i> (< <i>imati</i> )

Of all the examples, morphophonological weakening is attested in English *hafta/hasda* (ex. 2)), Latin *habere* (exs. 4, 14)), Netherland *fo* (ex. 5)), English *shall*/Swedish *ska* (ex. 11)), Bulgarian *njama da* (ex. 16)), Kru *ka/kɛ* (ex. 17)), Ukrainian *-im-* (ex. 18)). Such is the typological distribution of morphophonological weakening in this cross-linguistic pathway (lexical verb (V) 'to have' > modal verb (Mod) > future tense marker (T(future))). In this next section, I analyse the typological distribution of morphophonological weakening of copula verbs.

#### Section 2.1: determiner (D) > copula verbs (Pred/T):<sup>104</sup>

In chapter 3, section 2, I argue that the grammaticalization of Chinese *shi* as a copula verb originates from equational constructions in which *shi* is the subject determiner (SpecPred) and has an anaphoric phi-agreeing relation with the topic (see chapter 3, section 2, ex. 7a)), and when it is re-analysed as a copula verb (Pred), it selects the former topic as its subject and undergoes Pred-to-T *Move/Agree* (see chapter 3, section 2, ex. 7b)):

<sup>104</sup> Subject determiners are by no means the only lexical source for copula verbs, as stative lexical verbs are also grammaticalized as copula verbs (Devitt (1990, 1994:), Stassen (1997), Pustet (2003:54)). Even among copulas that are derived from subject determiners, there are subject determiners which show cataphoric relation with the predicate rather than anaphoric relation with the topic (e.g. Hebrew *ze, zot* (Diessel (1999:145-147)). Also, there are copulas derived from subject determiners which select locative complements rather than predicational ones (e.g. Bari *lu* (Devitt (1994:55)). In this section, I focus solely on anaphoric subject determiners which are re-analysed as copula verbs and select predicational complements, which directly parallel Chinese *shi* (cf Li and Thompson (1976), van Gelderen (2011a:chapter 4, 2015)).



There is a typology of such copula verbs, since while some show morphological distinctions of tense/subject-agreement (i.e. T features), others, like Chinese *shi*, do not (see chapter 2, section 2.3, especially footnote 66). There is, therefore, ‘context reduction’ in the former but ‘context expansion’ in the latter (see chapter 3, section 2). In this section, I present all such copula verbs and analyse their morphophonological weakening accordingly.

## Section 2.2: copula verbs (Pred/T):

### 19) Arabic *huwwa/hiyye*:

Arabic copulas *huwwa/hiyye* are derived from personal pronouns *huwwa* ‘he’ and *hiyye* ‘she’ respectively and show subject-agreement of gender and number with their respective subjects (Li and Thompson (1976:431-433), Eid (1983), Alsaeedi (2015)):

- 19a)    il                    rozzal    huwwe                    il                    usta:z  
          DEF.ART           man    MASC.SG.PRO    DEF.ART           teacher.MASC

‘The man, he, the teacher.’ > ‘The man is the teacher.’

(Palestinian Arabic, in Li and Thompson (1976:432))

- 19b)    il                    bint    hiyye                    le                    mʕalme  
          DEF.ART           girl    FEM.SG.PRO    DEF.ART           teacher.FEM

‘The girl, she, the teacher.’ OR ‘The girl is the teacher.’

(Palestinian Arabic, in Li and Thompson (1976:431))

Furthermore, Arabic *huwwe* is also generalised with non-3<sup>rd</sup> person subjects in certain dialects too (Li and Thompson (1976:432-433)):

- 19c) Ana/inta huwwe il usta:z alli Far:d ʕallak ʕanno  
 I/you COP DEF.ART teacher REL.PRO Fari:d talk.PAST about.him  
 'I am/you are the teacher that Fareed talked about.'  
 (Palestinian Arabic, in Li and Thompson (1976:432))

Morphophonological weakening is attested in Hejazi Arabic where *huwa* is often shortened as *hu* and *ma* (negator) + *huwa/hiya* is shortened as *mu/mi* respectively (Alsaeedi (2015)).

#### 20) Chinese *shi*:

Chinese copula *shi* is derived from Ancient Chinese demonstrative pronoun *shi* 'this' (cf chapter 1, section 2.3, chapter 3, section 2)):

- 20a) qian li er jian wang  
 thousand mile then see king  
 shi wo suo yu ye  
 SHI I NOMINALISER desire DECLARATIVE.PARTICLE  
 'To see the king after travelling a thousand miles, this (is) what I want.' 22a) >  
 'To see the king after travelling a thousand miles is what I want.' (22b))  
 (Mencius, 4<sup>th</sup> century BC) (=chapter 1, section 2.3, ex.10)

As a copula verb, *shi* is generalised to all subjects in all tenses (cf chapter 3, section 2):

- 20b) yu shi suo jia fu-ren zhi fu ye  
 I SHI RELATIVISER marry woman POSSESSIVE.MARKER father PARTICLE  
 'I am the father of the married woman.' (Li and Thompson (1976:426))

As far as I can find, no morphophonological weakening is attested.

#### 21) Egyptian *pw*:

Old Egyptian copula *pw* is derived from the demonstrative pronoun *pw* 'that' and is used with a wide range of subjects (Stassen (1997:30-35), Heine and Kuteva (2002:46)):

- 21a) tmjt pw jmnt  
 City that west  
 'The West, that, a city' > 'The west is a city.' (Stassen (1997:31)).

As far as I can find, no morphophonological weakening is attested.

22) Finnish *on*:

Finnish copula *on* is derived from the third person pronominal form *on* 'he' and it shows subject-agreement as it is only used with third person singular subjects (Katz (1996:105)):

22a) Ivan on bolen

Ivan he sick

'Ivan, he, sick' > 'Ivan is sick.' (Katz (1996:105))

As far as I can see, no morphophonological weakening is attested.

23) Hausa *ne/ce*:

Hausa copulas *ne* and *ce* are derived from personal pronouns *ne* and *ce* respectively and show subject-agreement of gender and number with their respective subjects (Schuh (1983:312-313)):

23a) Audu manomi ne

Audu.MASC.SG farmer COP.MASC.SG

'Audu is a farmer.'

23b) tunkiya ce

sheep.FEM.SG COP.FEM.SG

'It is a sheep.'

23c) tumaki ne

sheep.PLURAL COP.PLURAL

'They are sheep.'

As far as I can find, no morphophonological weakening is attested.

24) Hebrew *hu/hi/hem/hen*:

Hebrew copulas are derived from personal pronouns (*hu* 'he', *hi* 'she', *hem* 'they (masculine plural)', *hen* 'they' (feminine plural)) and show subject-agreement of gender and number with their respective subjects (Li and Thompson (1976:427-431), Berman and Grosu (1976:270-271), Doron (1986), Gilnert (1989:188-189)):

24a) Ha-sha'on hu matana

The-clock.MASC.SG PRO.MASC.SG clock

'The clock, it (MASC.SG), a present.' > 'The clock is a present.'

24b) Hevrat bóing hi taagid anaki  
 Company.FEM.SG Boeing PRO.FEM.SG corporation giant  
 ‘The Boeing company, it (FEM.SG), a giant corporation.’ > ‘The Boeing company is a giant corporation.’

24c) ma hem nimusim?  
 What COP.MASC.PL manner.MASC.PL  
 ‘What are manners?’

24d) éyfo hen ha-bahurot?  
 Where COP.FEM.PL girl.FEM.PL  
 ‘Where are the girls?’

Hebrew *hu* has also been generalised to other persons (Berman and Grosu (1976:271), Li and Thompson (1976:430)):

24e) Ani/ata/hu hu hasoter  
 I/you/he COP.MASC.SG the.policeman  
 ‘I am/you are/he is the policeman.’

As far as I can find, no morphophonological weakening is attested.<sup>105</sup>

25) Kenya Luo *e’n*:

Kenya Luo copula *e’n* is derived from the third person pronoun *e’n* ‘she’ and shows subject-agreement of gender and number with the subject:

25a) dhákó en bé^r  
 Woman COP.3SG.FEM goodness  
 ‘Woman, she, goodness’ > ‘Woman is goodness.’

While Kenyan Luo *e’n* is only used with third person subjects (Tucker (1993:308)), Lango *én*, which is a closely related dialect (Putset (2003:56)), is generalised to all subjects (Noonan (1982:45)):

25b) án én a-dáktal  
 I.SG COP 1SG-doctor.HAB  
 ‘I am the doctor.’ (Noonan (1992:146))

As far as I can see, no morphophonological weakening is observed.

<sup>105</sup> I am grateful to several native Hebrew speakers for confirming this to me.

26) Kilba *yá/ká/cá/má*

Kilba copulas *yá/ká/cá/má* are derived from personal pronouns *yá/ká/cá/má* respectively and show subject-agreement with their respective subjects (Schuh (1983:314ff)):

26a) *həbà yá*

Kilba COP.1SG

‘I am a Kilba.’

26b) *həbà ká*

Kilba COP.2SG

‘You are a Kilba.’

26c) *həbà cá*

Kilba COP.3SG

‘He is a farmer.’

26d) *həbà má*

Kilba COP.1PL

‘We are Kilbas.’

Furthermore, demonstrative pronouns with different deixes are grammaticalized as copula forms which denote tense (*nà* (proximal > present), *ndà, ngà* (distal > past)) (Schuh (1983:319ff)):

26e) *ùsmân həbà ná*

Usman Kilba COP.PRES

‘Usman is a Kilba.’

26f) *ùsmân həbà ndá*

Usman Kilba COP.PAST

‘Usman was a Kilba.’

26g) *ùsmân həbà ngá*

Usman Kilba COP.PAST

‘Usman was a Kilba.’

As far as I can find, there is no morphophonological weakening here.<sup>106</sup>

27) Nuer *e/ke*:

Nuer copulas *e* and *ke* are derived from personal pronouns *en* ‘he’ and *ken* ‘they’ respectively (Crazzolara (1933:89)):

27a)    *jen*        *e*                      *kaal*  
           He        COP.3SG        farmer  
           ‘He is a farmer.’ (Crazzolara (1933:89))

27b)    *ke*                      *haki*  
           COP.3PL        cups  
           ‘They are cups.’ (Crazolara (1933:89))

There is morphophonological weakening here (*en* > *e*, *ken* > *ke*) (Crazzolara (1933:89)).

28) Panare *kěj, něj, mën*:

Panare copulas *kěj*, *nej* and *mën* are derived from demonstrative pronouns *kën* (animate/proximal), *nej* (animate/distal) and *mën* (inanimate/distal) respectively (Gildea (1993:54-56)), and they show subject-agreement of deixis and animacy with their respective subjects:

28a)    Maestro        *kěj*                      *měj*  
           Teacher        ANIMATE.PROXIMAL    ANIMATE.VISIBLE  
           ‘This guy here (*měj*), he here (*kěj*), a teacher.’ > ‘This guy here is (*kěj*) a teacher.’

28b)    Maestro        *nej*                      *kën*  
           Teacher        ANIMATE.DISTAL        ANIMATE.INVISIBLE  
           ‘That guy there (*kën*), he there (*nej*), a teacher.’ > ‘That guy there is (*nej*) a teacher.’

28c)    E’chipen        *mën*                      *manko*  
           Fruit            INAN                      mango.INANIMATE  
           ‘Mango, this, a fruit.’ > ‘Mango is a fruit.’<sup>107</sup>

<sup>106</sup> It has been suggested that the demonstrative copular forms may have undergone phonological weakening if they are derived from complex demonstratives (*ná* < *nənanənnà* ‘this’ (proximal), *ndá* < *nàndándà* ‘that’ (distal), *ngá* < *ngəngəngà* ‘that’ (removed) (Diessel (1999:147)), but this is far from certain, since there exists a set of simple demonstratives which may well be the origins of these copular forms (*nà* ‘this’ (proximal), *ndà* ‘that’ (distal), *ngà* ‘that’ (removed) (Schuh (1983:315)).

<sup>107</sup> As Panare is head-final, Gildea (1993:56-60) argues for a right-dislocated Topic (e.g. *měj* in *kën* in ) and subjects (e.g. *kěj* in *nej* in ) that occur to the right of the predicate (*maestro* ).

Furthermore, these copulas denote tense when they do not show subject-agreement (Gildea (1993:59-61)):

- 28d) Maestro          něj                                  měj  
Teacher          ANIMATE.DISTAL          ANIMATE.VISIBLE  
'This guy here (*měj*) was (*něj*) a teacher.'
- 28e) Maestro          kěj                                  kěn  
Teacher          ANIMATE.PROXIMAL          ANIMATE.INVISIBLE  
'That guy there (*kěn*) is being (*kěj*) a teacher right now.'
- 28f) Maestro          něj                                  chu  
Teacher          ANIMATE.DISTAL          1SG  
'I (*chu*) was (*něj*) a teacher.'
- 28g) Maestro          něj                                  aměn  
Teacher          ANIMATE.DISTAL          2SG  
'You (*aměn*) were (*něj*) a teacher.'

As far as I can find, no morphophonological weakening is attested.<sup>108</sup>

#### 29) Saramaccan *da/de*:

Saramaccan copular forms *da* and *de* are derived from the demonstrative pronouns *da* 'that' and *de* 'there' respectively (McWhorter (1997:93ff)).<sup>109</sup>

- 29a) Granman          da          Kofi  
Leader          COP          Kofi  
'The leader, that, Kofi' > 'The leader is Kofi.' (McWhorter (1997:97))
- 29b) a          de          wan          gaán          dāgu  
It          COP          a          big          dog  
'It, there', a big dog' > 'It is a big dog.' (McWhorter (1997:87))

These copular forms are also generalised to all persons:

<sup>108</sup> Although the copula form *kěj* differs phonologically from its original pronominal form *kěn* (Gildea (1993:56)), there is no loss of phoneme and so this cannot be qualified as phonological weakening.

<sup>109</sup> There is a rough division of labor between *da* and *de* in that while the former is used mainly for equative predicates, the latter is used for locative ones (McWhorter (1997:86)), though this is far from clear as *de* is used in equative sentences too (see ex. 26b)).



29c) mi da i tatá  
 I COP your father  
 'I am your father.' (McWhorter (1997:87))

29d) mi de wan muffin  
 I COP a wretch  
 'I am a wretch.' (McWhorter (1997:108))

As far as I can find, no morphophonological weakening is attested.

### 30) Tigre *hetu*:

Tigre copula forms are derived from personal pronouns, and they show subject agreement with their respective subjects (Devitt (1994:39)):

30a) sab mansaṣ mən badirom kəstan tom  
 People Mansa from long.ago Christians are  
 'The people of Mansa are Christians from long ago.' (Devitt (1994:39))

The third person copula forms can be used with non-third persons as well (Devitt (1994:39)). Morphophonological weakening is attested, as the third person copula forms are shorter than their original pronominal forms (*hetu* 3SG.MASC > *tu*) (Devitt (1994:39)).

### 31) Tok Pisin *em*:

Tok Pisin copula *em* is derived from the personal pronoun *em* 'he' and shows subject-agreement (Verhaar (1995:81-83)):

31a) em Prait Minista  
 COP Prime Minister  
 'That is the Prime Minister.' (Verhaar (1995:83))

As far as I can find, there is no morphophonological weakening here.

### 32) Wappo *ce?*:

Wappo copula *ce?* is derived from the demonstrative pronoun *ce?e?* 'that' (Li and Thompson (1976: 433-434)):

32a) Ce?e? teme? ?eka  
 This his child  
 'This, his child' > 'This is (*ce?e?*) his child.'

Furthermore, the use of copula *ce?e?* is generalised to all persons (Li and Thompson (1976:433-434)):

32b) ?i ce?e? teme? ?eka

I COP his child

‘I am his child.’

32c) Te ce?e? kanitucma

He COP chief

‘He is the/a chief.’

32d) Mi ce?e? ?i-nokh

You COP my-friend

‘You are my friend.’

Morphophonological weakening is attested, since the second syllable of the original copula *ce?e?* is optional (> *ce?*).<sup>110</sup>

33) West Greenlandic Eskimo *tassa*:

The West Greenlandic Eskimo copula *tassa* is derived from the demonstrative pronoun *tassa* ‘that’ (Devitt (1994:38)):

33a) Hansi tassa pisurtaq

Hansi that the.leader

‘Hansi, that, the leader.’ > ‘Hansi is the leader.’

As far as I can find, no morphophonological weakening is attested.

34) Zoque

The Zoque copula *-te* is etymologically related to the demonstrative pronoun *te* (Faarlund (2007)):<sup>111</sup>

34a) te xka;e che’bü te’

The girl small she

‘The girl, that, small’ > ‘The girl is small.’ (Faarlund (2007:233))

As a copula, *-te* is also generalised to all persons:

<sup>110</sup> Although Li and Thompson (1976:434) argue that *ce?e?* is an amalgam of *ce* and an original copula form *e?* and the Wappo demonstrative is actually *ce*, it remains the case that the original form *ce?e?* is shortened as *ce*.

<sup>111</sup> I am grateful to Professor Jan Terje Faarlund for pointing this example out to me.

34b) y-‘anmayobyabü-te

2SG-teacher-COP

‘You are a teacher.’ (Faarlund (2007:233))

34c) ø-anmayobyabü-‘tsi-te

1SG-teacher-1ABS-COP

‘I am a teacher.’ (Faarlund (2007:233))

34d) ø-anmayabyabü-te

3SG-teacher-COP

‘S/he is a teacher.’ (Faarlund (2007:233))

There is morphophonological weakening here, as the original demonstrative pronoun is weakened as a clitic (Faarlund (2012:233-234)).

The grammaticalization of subject determiners (D) as copula verbs (Pred/T), therefore, can be represented thus:

Table 5:

Language/example	Pre-grammaticalized category	Post-grammaticalized category	Morphophonological weakening
Arabic <i>huwwa</i> / <i>hiyye</i> (ex. 19))	Personal pronoun in subject position (SpecPred) with phi-agreeing topics ( <i>huwwa</i> ‘he’ (3SG.MASC)/ <i>hiyye</i> ‘she’ (3SG.FEM))	Copula with phi-agreeing subjects ( <i>huwwa</i> (3SG.MASC), <i>hiyye</i> (3SG.FEM); <i>huwwe</i> with all persons	<i>Huwwe</i> > <i>hu</i> (Hejazi Arabic)
Chinese <i>shi</i> (ex. 20))	Demonstrative pronoun in subject position (SpecPred) with phi-agreeing topics (3SG/3PL)	Copula with all subjects	-
Egyptian <i>pw</i> (ex. 21))	Demonstrative pronoun in subject position (SpecPred) with phi-agreeing topics (3SG/3PL)	Copula with all subjects	-
Finnish <i>on</i> (ex. 22))	Personal pronoun in subject position (SpecPred) with phi-agreeing topics ( <i>on</i> (3SG.MASC)	Copula with phi-agreeing subjects (3SG.MASC)	-
Hausa <i>ce/ne</i> (ex. 23))	Personal pronouns in subject position	Copula with phi-agreeing subjects ( <i>ne</i>	-

	(SpecPred) with phi-agreeing topics ( <i>ne</i> (3SG.MASC), <i>ce</i> (3SG.FEM))	(3SG.MASC), <i>ce</i> (3SG.FEM))	
Hebrew <i>hu/hi/hem/hen</i> (ex. 24))	Personal pronouns in subject position (SpecPred) with phi-agreeing topics ( <i>hu</i> (3SG.MASC), <i>hi</i> (3SG.FEM), <i>hem</i> (3PL.MASC), <i>hen</i> (3PL.FEM))	Copula with phi-agreeing subjects ( <i>hu</i> (3SG.MASC), <i>hi</i> (3SG.FEM), <i>hem</i> (3PL.MASC), <i>hen</i> (3PL.FEM)); <i>hu</i> with all persons	-
Kenyan <i>en</i> (ex. 25))	Personal pronoun in subject position (SpecPred) with phi-agreeing topics ( <i>en</i> (3SG.FEM))	Copula with phi-agreeing subjects (Kenyan Luo <i>en</i> (3SG.FEM)); Lango <i>en</i> with all persons	-
Kilba <i>yá/ká/cá/má, ná/ndá/ngá</i> (ex. 26))	Personal pronouns in subject position (SpecPred) with phi-agreeing topics ( <i>yá</i> (1SG), <i>ká</i> (2SG), <i>cá</i> (3SG), <i>má</i> (1PL); demonstrative pronouns with phi-agreeing topics ( <i>ná</i> (proximal), <i>ndá</i> (distal), <i>ngá</i> (distal))	Copula with phi-agreeing subjects ( <i>yá</i> (1SG), <i>ká</i> (2SG), <i>cá</i> (3SG), <i>má</i> (1PL); copula with tense ( <i>ná</i> (present), <i>ndá</i> (past), <i>ngá</i> (past))	-
Nuer <i>e/ke</i> (ex. 27))	Personal pronouns in subject position (SpecPred) with phi-agreeing topics ( <i>e</i> (3SG), <i>ke</i> (3PL))	Copula with phi-agreeing subjects ( <i>e</i> (3SG), <i>ke</i> (3PL))	<i>En</i> > <i>e</i> , <i>ken</i> > <i>ke</i>
Panare <i>kěj, něj, mën</i> (ex. 28))	Demonstrative pronouns in subject position (SpecPred) with phi-agreeing topics ( <i>kěj</i> (animate.proximal), <i>něj</i> (animate.invisible), <i>mën</i> (inanimate))	Copula with phi-agreeing subjects ( <i>kěj</i> (animate.proximal), <i>něj</i> (animate.invisible), <i>mën</i> (inanimate)); copula with tense ( <i>kěj</i> (present tense), <i>něj</i> (past))	-
Saramaccan <i>da/de</i> (ex. 29))	Demonstrative pronouns in subject position (SpecPred) with phi-agreeing topics ( <i>da</i> (3SG), <i>de</i> (3SG))	Copula with all subjects	-
Tigre <i>hetu</i> (ex. 30))	Personal pronouns in subject position (SpecPred) with phi-agreeing topics	Copula with phi-agreeing subjects; <i>hetu</i> (3SG) with all persons	<i>Hetu</i> > <i>tu</i>

Tok Pisin <i>em</i> (ex. 31))	Personal pronoun in subject position (SpecPred) with phi-agreeing topics	Copula with phi-agreeing subjects	-
Wappo <i>ce?</i> (ex. 32))	Demonstrative pronoun in subject position (SpecPred) with phi-agreeing topics	Copula with all subjects	<i>Ce?e?</i> > <i>ce?</i>
West Greelandic Eskimo <i>tassa</i> (ex. 33))	Demonstrative pronoun in subject position (SpecPred) with phi-agreeing topics	Copula with phi-agreeing topics (3SG/3PL)	-
Zoque <i>-te</i> (ex. 34))	Demonstrative pronoun in subject position (SpecPred) with phi-agreeing topics	Copula with all subjects	<i>Te</i> > <i>-te</i>

Of these examples, morphophonological weakening is only attested in Arabic (*huwwe* > *hu* (ex. 19)), Nuer (*en* > *e*, *ken* > *ke* (ex. 27)), Tigre (*hetu* > *tu* (ex. 30)), Wappo (*ce?e?* > *ce?* (ex. 32)), Zoque (*te* > *-te* (ex. 34)), all of which, with the exception of Nuer *e/ke* (ex. 27)), undergo ‘context expansion’ as these originally 3<sup>rd</sup> person pronouns are generalised to all pronouns (exs. 19c), 30), 32b-d), 34b-d)). The only exception is Nuer copulas *e/ke* which are only used with phi-agreeing subjects (i.e. ‘context reduction’) but show morphophonological weakening nonetheless. However, it remains the case that ‘L-shift’, which entails ‘context reduction’ (in this case, tense and/or subject-agreement features (T)), prevents morphophonological weakening. An explanation based on frequency effects will be given in the next chapter.

#### Conclusion:

A comparison between the grammaticalizing elements in SG (V > Mod<sub>Obligation/Necessity</sub> > T(future)) and LG (D > Pred/T) shows empirical differences, since while morphophonological weakening is common in the former (see section 2), it is much less so in the latter (see section 3), which speaks for a real empirical difference between SG and LG (see chapter 1, section 3, chapter 2, section 2). It now remains to analyse the diachronic frequencies of the grammaticalizing elements in my case studies of SG (e.g. Latin *habere* in the grammaticalization of the Romance future, see chapter 3, section 1) and LG (e.g. Chinese copula *shi*, see chapter 3, section 2) and correlate them with the degrees of morphophonological weakening in their cross-linguistic counterparts (see tables 4 and 5).

## Chapter 5: diachronic frequencies of SG and LG:

As SG and LG display ‘context expansion’ and ‘context reduction’ respectively (see chapters 2 and 3), they entail different frequency effects which seem to produce different degrees of morphophonological weakening in the grammaticalizing elements (see chapter 4). In this chapter, I propose to compare the diachronic frequencies of Latin *habere* in its grammaticalization as the Romance future (V > Mod<sub>Obligation/Necessity</sub> > T(future)) (SG) (see chapter 3, section 1) and those of Chinese copula *shi* (D > Pred/T) (LG) (see chapter 3, section 2) and correlate them with the degrees of morphophonological weakening in my cross-examples of SG (V ‘to have’ > Mod<sub>Obligation/Necessity</sub> > T(future)) and LG (D > Pred/T) (see chapter 4). In my analysis of the diachronic frequencies of the grammaticalizing elements, I propose to employ ‘Collostructional Analysis’ (CA) as proposed by Stefanowitsch and Gries (2003, 2004) and Hilpert (2008).

### Section 1: ‘Collostructional Analysis’:

Stefanowitsch and Gries (2003) introduce a new method of counting the frequencies of linguistic elements by analysing their statistical affinities within a particular construction. Within a construction, therefore, there are ‘collexemes’, namely the lexical items which occupy the various slots of the construction in question. This analysis has been applied to the grammaticalization of Germanic future tense markers by Hilpert (2008), who examines the diachrony frequencies of the grammaticalizing elements (English *shall*, Swedish *ska(II)*, Danish *skal*, cf chapter 4, section 1.3.2, ex. 11)) in relation to the number of ‘collexemes’ they are attested with. With these assumptions, I propose to analyse the frequencies of Latin *habere* + infinitive in the grammaticalization of the Romance future and Chinese *shi* in the grammaticalization of the Chinese copula. As grammaticalization often retains the original category of the grammaticalizing element, it creates a synchronic ‘layering’ between the original pre-grammaticalized category of the grammaticalizing element and its new grammaticalized category (Hopper (1991:22-31), Bybee et al (1994:19-22)), which makes it possible to compare directly the relative frequencies of the original pre-grammaticalized category and the new grammaticalized category of the grammaticalizing element.<sup>112</sup> In this chapter, I apply CA to Latin *habere* in its grammaticalization as the Romance future and Chinese *shi* in its grammaticalization as a copula verb and calculate their increase/decrease in frequency during their respective grammaticalization.

### Section 2.1: Romance future (Latin *habere*) (V > Mod<sub>Obligation/necessity</sub> > T(future)) (SG):

It has been pointed out that Latin *habere* + infinitive is only attested in significant quantities in Tertullian (140-220 AD) and Augustine (354-430 AD) (Tara (2014:268), cf Coleman (1971:226)). I have, therefore, collected examples of *habere* + infinitive in all the extant texts of Tertullian and Augustine.<sup>113 114</sup> Furthermore, as reflexes of Latin *habere* do not become fully generalised as the

<sup>112</sup> This ‘layering’ is widely known as a diagnostic trait of grammaticalization (Hopper (1991:22-31), Bybee et al (1994:19-22)). Roberts (2010, 2012) accounts for ‘layering’ in grammaticalization by postulating ‘lexical splits’, namely the synchronic co-existence of multiple syntactic categories for the grammaticalizing element e.g. English modals, some of which retain their original lexical verbal properties in certain dialects and are hence classified as V and T elements synchronically (cf chapter 2, sections 1.4, 2.2, especially footnote 56).

<sup>113</sup> All my Latin texts are extracted from online sources (<http://www.tertullian.org/latin/latin.htm> for Tertullian and <http://www.augustinus.it/latino/> for Augustine), a full list of which is given in the appendix. In discovering all the attested examples of Latin *habere* + infinitive in my Latin texts, I have processed all my texts in the

default future tense paradigm until Medieval Romance (see chapter 3, section 1.2), I have also collected examples of *habere* + infinitive in Medieval Spanish where modal uses of Latin *habere* are retained (see chapter 3, sections 1.2-1.3).<sup>115</sup> In this section, I compare the type and token frequencies of Latin *habere* + infinitive in my Latin and Romance corpora and trace the diachronic frequencies of Latin *habere* in its grammaticalization as the Romance future, which consist of the following stages: lexical verb ‘to have’ (V), modal verb denoting possibility and obligation/necessity (Mod<sub>Possibility</sub>/Mod<sub>Obligation/necessity</sub>), and future tense (T(future)) (see chapter 3, section 1):

Table 1 (cf chapter 3, tables 1-3):

Stage (type frequency)	Meaning	Subject	Infinitival complement
Latin <i>habere</i> (V)	To have	Animate	Two place predicates
Latin <i>habere</i> (Mod <sub>Possibility</sub> /Mod <sub>Obligation/necessity</sub> )	Modal verb denoting possibility and obligation/necessity	Animate/human agents	All lexical verbs, including one place predicates like passive and intransitive verbs
Late Latin <i>habere</i> (T(future))	Future tense	All subjects, including inanimate subjects	All lexical verbs, mainly in certain morphosyntactic slots, namely passive infinitive and future-in-the-past
Medieval Romance (T(future))	Future tense	All subjects	All verbs

Throughout the grammaticalization process, therefore, there is a gradual ‘context expansion’ of Latin *habere* in its infinitival complements and subjects. The number of attestations for each stage of grammaticalization is given in the following sub-sections.

### Section 1.2: Tertullian (160-220 AD):

In Tertullian, the first three stages in the grammaticalization of Latin *habere* as the Romance future are attested, namely lexical verb ‘to have’ (V), modal verb denoting possibility and

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concordance program in Antconc with the search term *hab-*, which is an invariant morpheme in the verbal paradigm of Latin *habere*. I thank Dr Ann Taylor for her advice on this.

<sup>114</sup> It is conjectured that as Christian fathers had a propensity to use spoken forms in their writings/speeches in order to be as comprehensible and accessible as possible to their vulgar audience (, proto-Romance forms which have evolved from Latin speech are more richly attested in certain registers like Christian writings ( In the case of the grammaticalization of Latin *habere* as the Romance future, it has been argued that its use as a future tense marker is particularly obvious in certain Christian authors like Tertullian and Augustine (Tara (2014).

<sup>115</sup> For Medieval Spanish, I have utilised Beardsley’s (1921) classic corpus of Medieval Spanish texts, a full list of which consists of the following: *el Poema del Mio Cid*, *el Libro de Alexandre*, the complete works of Gonzalo de Berceo (*Vida de Santo Domingo de Silos*, *El sacrificio de la Misa*, *La Vida del Sancto Domingo de Silos*, *Del Sacrificio de la Missa*, *La Estoria de Sennor Santo Millan*, *El Martyrio de Sant Laurencio*, *Loores de Nuestra Sennora*, *De los Signos que apresceran ante del Juicio*, *Milagros de Nuestra Senora*, *El Duelo que fizo la Virgen Maria el Dia de la Pasi3n de su Fijo Jesu Christo*, *Vida de Sancta Oria*, *Virgen*), and *La Primera Cr3nica General*.

obligation/necessity (Mod<sub>Possibility</sub>/Mod<sub>Obligation/necessity</sub>), and future tense maker (T(future)) (cf Raiskila (1990)):<sup>116</sup>

*Habere* (V) ‘to have’:

- 1a)    adhuc   mult-a                hab-e-o                loqu-i   ad        vos  
          still     many-N.PL        have-PRES-1SG say-INF to        you  
          ‘I still have (*habeo*) many things to say to you...’ (*De virginibus velandis* 1.5)

*Habere* (Mod<sub>Possibility</sub>):

- 1b)    corpus,                quod                solum   ab        homin-ibus  
          body.N.SG        REL.PRO.N.SG    only    by        men-ABL.PL  
          habet                        occid-i  
          HABERE-PRES.3SG    kill-PASS.INF  
          ‘his body, which can only be killed by men.’ (*de pudicitia* 9.10)

*Habere* (Mod<sub>Obligation/Necessity</sub>):

- 1c)    etiam   fili-us                dei                mor-I    hab-ui-t  
          Even   son-NOM.SG    God-GEN.SG    die-INF HABERE-PERF-3SG  
          ‘Even the son of God had to die.’ (*de feminarum cultu* 1.1.2)

*Habere* (T(future)):

- 1di)    ad        futur-am                gloria-m                qu-ae                in        nos  
          to        future-FEM.ACC.SG    glory-FEM.ACC.SG    REL.PRO-NOM.SG into    us  
          hab-e-t                revel-ar-i  
          have-PRES-3SG reveal-INF-PASS  
          ‘to the future glory which will be revealed (*habet revelari*) to us.’  
          (*De resurrectione carnis* 40.86.16)

- 1dii)    in        nation-ibus    a        qui-bus                magis  
          in        nation-ABL.PL    by        REL.PRO-ABL.PL        most

<sup>116</sup> The classification of Latin *habere*, especially of its modal nuances, is not always easy and clear-cut and may be subject to personal opinion (cf Raiskila (1990)).



suscip-i                      habe-bat  
 accept-INF.PASS            HABERE-IMPF.3SG

‘Among the nations by which most would be accepted (*suscipi-habebat*).’

(*Adversus Marcionem* 9.9)

The following collocations, therefore, have been collected:

Table 2 (*habere* + infinitive in Tertullian):

	Meaning	Token frequency
<i>Habere</i> (V)	To have	4
<i>Habere</i> (Mod <sub>Possibility</sub> )	Possibility	28
<i>Habere</i> (Mod <sub>Obligation/necessity</sub> )	Obligation/necessity	39
<i>Habere</i> (T(future))	Future tense	78

‘Context expansion’ has given rise to an increase in the number of Latin *habere* + infinitive, since while *habere* as a lexical verb (V) is only used with two place predicates and is only attested four times, as a modal verb (Mod<sub>Possibility</sub>/Mod<sub>Obligation/necessity</sub>), *habere* is attested 67 (28 + 39) times and as a future tense marker *habere* is attested 78 times. In Tertullian, therefore, there is a clear rise in frequency in the use of *habere* + infinitive which correlates the stages of its grammaticalization (V > Mod<sub>Obligation/necessity</sub> > T(future)). More will be said about this below.

### Section 1.3: Augustine (354-430 AD):

In Augustine, the same three stages of *habere* + infinitive are likewise attested, namely lexical verb ‘to have’ (V), modal verb denoting possibility and obligation/necessity (Mod<sub>Possibility</sub>/Mod<sub>Obligation/necessity</sub>), and future tense marker (T(future)):

*Habere* ‘to have’ (V):

2a)     Adhuc   mult-a            hab-e-o                      vobis                      dic-ere  
          Still     many-N.PL       have-PRES-1SG           PRO.2PL.DAT     say-INF

‘I still have many things to say to you.’ (Sermon 362)

*Habere* (Mod<sub>Possibility</sub>):

2b) quid enim voluptat-is habet vid-ere  
 INTERROGATIVE.PRONOUN for pleasure-GEN.SG HABERE-PRES.SG see-INF  
 in lani-at-o cadaver-e quod exhorreas?  
 In slaughter-PERF.PART-ABL.SG corpse-ABL.SG REL.PRO fear-PRES.SUBJ-2SG  
 ‘For what pleasure can he see in a slaughtered corpse which you abhor?’  
 (*Confessiones* 10.35.55)

*Habere* (Mod<sub>Obligation/necessity</sub>):

2c) qui-d hab-e-mus ador-are?  
 INTERROGATIVE.PRO-N.SG HABERE-PRES-1PL adore-INF  
 ‘What must we adore?’ (Psalm 98.9.2)

*Habere* (T(future)):

2di) Hab-e-s erubesc-ere,  
 Have-PRES-2SG blush-INF  
 cum ven-eri-t in glory-a su-a  
 when come-FUT.PERF-3SG in glory-FEM.SG.ABL POSS.ADJ-FEM.SG.ABL  
 ‘You will blush when he comes in his glory’ (Sermon 279)

2dii) et post haec omni-a  
 and after this.N.PL all-N.PL  
 fin-ire hab-e-s vitam  
 end-INF have-PRES.2SG life-ACC.SG  
 ‘and after all these things you will end your life.’ (Sermon 84)

The following collocations have been collected:

Table 3 (*habere* + infinitive in Augustine):

	Meaning	Token frequency
<i>Habere</i> (V)	To have	8
<i>Habere</i> (Mod <sub>Possibility</sub> )	Possibility	45
<i>Habere</i> (Mod <sub>Obligation/necessity</sub> )	Obligation/necessity	58
<i>Habere</i> (T(future))	Future tense	105

‘Context expansion’ has given rise to a rise in frequency to *habere* + infinitive, since while *habere* as a lexical verb (V) is only attested with two place predicates In Augustine, the number of future tense markers (105) also outnumbers the number of modal uses (58), which in turn outnumbers the number of lexical uses (8). ‘Context expansion’, therefore, has given rise to rise in frequency, which correlates with the

#### Section 1.4: Medieval Ibero-Romance:

In Ibero-Romance, only the final two stages are attested, namely modal verb denoting obligation/necessity (Mod<sub>Obligation/Necessity</sub>) and future tense marker (T(future)):

- 3a)      oyr-lo-an                      los              muertos  
             Hear-PRO-HABERE.3PL    the              dead  
             ‘The dead must hear it.’ (*De Los signos que aparesceran ante del Juicio* 22)
- 3b)      dexe-r-emos                      Burgos,              i-r-lo-hemos                      busca-r  
             Leave-INF-HABERE.1PL    Burgos              go-INF-it-HABERE.1PL    search-INF  
             ‘We shall leave Burgos, we shall look for him.’ (*El Poema del Mio Cid* 1438)

The following collocations have been collected:

Table 4 (*habere* + infinitive in Medieval Spanish):

	Meaning	Token frequency
Mod <sub>Obligation/Necessity</sub>	Obligation/necessity	24
T(future)	Future	198

In Medieval Ibero-Romance, the number of T(future) (198) far outnumbers the number of modal uses (Mod<sub>Obligation/Necessity</sub>) (24), which attests to the ‘context expansion’ in the final stage of the grammaticalization of Latin *habere* as a future tense marker (Mod<sub>Obligation/necessity</sub> > T(future)).

It is hence possible to trace the diachronic frequencies of Latin *habere* in the grammaticalization of the Romance future, which will be outlined in the next section.

#### Section 1.5: the diachronic frequencies of Latin *habere* as the Romance future (V > Mod<sub>Obligation/necessity</sub> > T(future)):

In Tertullian and Augustine, the number of modal *habere* (Mod) outnumbers lexical *habere* (V), while the number of future *habere* (T(future)) outnumbers the former even more (see sections 1.2-1.3). Furthermore, in Romance the number of future tense markers outnumbers that of modal uses of Latin *habere* even more, which accounts for the ‘context expansion’ of *habere* in its grammaticalization as the Romance future tense marker. Such rise in frequency correlates with the morphophonological weakening of V ‘to have’ > Mod > T(future) (see chapter 4, section 1).

Section 2.1: Chinese copula *shi*:

In chapter 3, section 2, I argued that Chinese copula *shi* undergo ‘context expansion’ and ‘context reduction’ simultaneously, since while its grammaticalization as a copular verb entails a wider range of subjects (see chapter 3, section 2.1), its subsequent tense/subject-agreement features (i.e. T features) creates subsets of copular constructions (see chapter 3, section 2.2), which are morphologically distinct in numerous cross-linguistic examples (see chapter 4, section 3). The diachronic frequencies of Chinese *shi*, therefore, may be represented thus:

Table 5 (cf chapter 3, section 2, tables 4-6):

Stage (type frequency)	Meaning	Complement
Subject determiner (D in SpecPred)	Demonstrative pronoun 'this' in subject position	Topics which show phi-agreement (3 <sup>rd</sup> -person) with <i>shi</i> 'this'
Copula verb (Pred)	Copula verb	All subjects
Subject agreement (AgrS)	Copula verb	Subjects of different persons and numbers
Tense (T)	Copula verb	Tenses of copula verb

There are, therefore, four stages in the grammaticalization of Chinese copula *shi*, namely subject determiner (D in SpecPred), copula verb (Pred), copula verb with subject agreement (AgrS) and copula verb with tense distinctions (T).<sup>117</sup> The frequency of the various constructions will be given in the next section.

Section 2.2: diachronic frequencies of Chinese copula *shi*:

As copular uses of Chinese *shi* become generalised and are hence statistically significant from Medieval Chinese onwards, I have collected examples of Chinese *shi* from the Tang Dynasty (7<sup>th</sup>-10<sup>th</sup> century AD) onwards (cf Wang (1958:35, 347ff)),<sup>118</sup> which display all four stages:

4a)	feng	shi	suo	gui,	shi	
	Historical	age	RELATIVISER	expensive	SHI	
	sai	lu	meng	long	jun	zhi jia
	carriage	camel	name	dragon	horse	POSSESSIVE.MARKER price
	'Historically expensive, this (is) the price for the dragon carriage horses.'					
	(Babuzi sishi juan) <sup>119</sup>					

<sup>117</sup> Technically, subject-agreement (AgrS) and tense (T) are sub-types of the copular functions of *shi* (Pred), as they are part of the Pred-to-T *Move/Agree* relation (cf chapter 2, section 2.3).

<sup>118</sup> I have utilized the online corpus of Chinese literary (mainly philosophical) texts (ctext.org), which consists of major authors in each dynasty. A full list of texts is given in the appendix. Furthermore, I have supplemented my historical corpus with the corpus of modern Chinese corpus compiled by the Peking University (CCL 2009). As these corpora are equipped with their own online search engines, I have entered the Chinese morpheme *shi* on them, which have automatically generated all the occurrences of *shi* in the online corpus.

4b) dedao sheng ren shi huanglao  
 Enlightened holy person SHI old.huang  
 zhi shi sheng ren Shi zhou kong er ren  
 heal world world person SHI Zhou Kong two people  
 ‘The enlightened saint is Old Huang, while the healing saint is Zhou and Kong.’  
 (Babuzi sishi jian)<sup>120</sup>

4c) wo shi ni de fang zhuren  
 I SHI you POSSESSIVE.MARKER room master  
 ‘I am your housemaster.’  
 (Yulin waishi, Bing jieren qinglou suanming dai mingshi jiguan xianshi)<sup>121</sup>

4d) ci yu shi xiri xia he  
 this jade SHI formerly name CONJ  
 yu jingshang zhi xia  
 at mountain.jing POSSESSIVE.MARKER below  
 Jian fenghuang qi yu shi shang,  
 See phoenix rest at rock above  
 Dai er jin zhi zhuwenwang  
 Bring CONJ bestow PRO name  
 ‘This jade is the thing which formerly Xia, when he, below the Mountain Jing, saw a phoenix on a rock, and brought it as a gift for Zhuwenwang.’ (Sanguo yanyi)<sup>122</sup>

<sup>119</sup> Topicalisation is clearly seen in Chinese where punctuation is used to separate the fronted topic (e.g. *feng shi suo gui* in ex. 4a)) and the main clause (e.g. *shi sail u meng long jun zhi jia* in ex. 4a)) (cf chapter 3, section 2.1). In these examples, *shi* has to be analysed as the subject of the main clause with an anaphoric binding relation with the topic. There are also examples where *shi* is used with a copular linking element (e.g. *wei*) which also forces *shi* to be analysed as a subject rather than copula (cf Peyraube and Wiebusch (1996)).

<sup>120</sup> Copula uses of *shi* are seen most clearly in examples where *shi* is not used with a topic and is hence not clause-initial (cf previous footnote). In such circumstances, *shi* is either preceded by a subject (e.g. *dedao shengren, zhishi shengren* in ex. 4a)) or an adverb (cf chapter 3, section 2.1). There are also examples where the copula *shi* and the predicate is inverted and *shi* must hence be analysed as a copula verb (cf chapter 3, section 2.1, footnote 92).

<sup>121</sup> As *shi* is used with non-3<sup>rd</sup> person subjects, there is no longer an anaphoric binding relation between them and *shi* must be analysed as a copular verb (cf chapter 3, section 2.1)). *Shi* is hence used with subjects of different persons here, which will be subdivided in my numerical analysis.

<sup>122</sup> As Chinese has very few tense markers, tense is pragmatically inferred from context, which, in the case of ex. 4d), is indicated by the adverb *xiri* ‘formerly’ (T(past)) (see chapter 3, footnote 93).

The following figures have been collected:

Sui/Tang dynasties (6<sup>th</sup>-10<sup>th</sup> century AD):

	Token frequency
<i>Shi</i> (D in SpecPred)	101
<i>Shi</i> (Pred)	55
<i>Shi</i> (T:1 <sup>st</sup> singular)	8
<i>Shi</i> (T:1 <sup>st</sup> plural)	0
<i>Shi</i> (T:2 <sup>nd</sup> singular)	5
<i>Shi</i> (T:2 <sup>nd</sup> plural)	0
<i>Shi</i> (T:3 <sup>rd</sup> singular)	29
<i>Shi</i> (T:3 <sup>rd</sup> plural)	13
<i>Shi</i> (T:present tense)	48
<i>Shi</i> (T:past tense)	7
<i>Shi</i> (T:future tense)	0

Song/Yuan/Ming dynasties (10<sup>th</sup>-17<sup>th</sup> century AD):

	Token frequency
<i>Shi</i> (D in SpecPred)	89
<i>Shi</i> (Pred)	112
<i>Shi</i> (T:1 <sup>st</sup> singular)	22
<i>Shi</i> (T:1 <sup>st</sup> plural)	19
<i>Shi</i> (T:2 <sup>nd</sup> singular)	18
<i>Shi</i> (T:2 <sup>nd</sup> plural)	3
<i>Shi</i> (T:3 <sup>rd</sup> singular)	30
<i>Shi</i> (T:3 <sup>rd</sup> plural)	20
<i>Shi</i> (T:present tense)	80
<i>Shi</i> (T:past tense)	27
<i>Shi</i> (T:future tense)	5

Qing dynasty (17<sup>th</sup>-20<sup>th</sup> century AD):

	Token frequency
<i>Shi</i> (D in SpecPred)	76
<i>Shi</i> (Pred)	235
<i>Shi</i> (T:1 <sup>st</sup> singular)	86
<i>Shi</i> (T:1 <sup>st</sup> plural)	26
<i>Shi</i> (T:2 <sup>nd</sup> singular)	46
<i>Shi</i> (T:2 <sup>nd</sup> plural)	20
<i>Shi</i> (T:3 <sup>rd</sup> singular)	41
<i>Shi</i> (T:3 <sup>rd</sup> plural)	16
<i>Shi</i> (T:present tense)	162
<i>Shi</i> (T:past tense)	53
<i>Shi</i> (T:future tense)	20

Modern period:

	Token frequency
<i>Shi</i> (D in SpecPred)	72
<i>Shi</i> (Pred)	367
<i>Shi</i> (T:1 <sup>st</sup> singular)	92
<i>Shi</i> (T:1 <sup>st</sup> plural)	46
<i>Shi</i> (T:2 <sup>nd</sup> singular)	62
<i>Shi</i> (T:2 <sup>nd</sup> plural)	34
<i>Shi</i> (T:3 <sup>rd</sup> singular)	73
<i>Shi</i> (T:3 <sup>rd</sup> plural)	60
<i>Shi</i> (T:present tense)	162
<i>Shi</i> (T:past tense)	107
<i>Shi</i> (T:future tense)	98

In the grammaticalization of Chinese copula *shi*, therefore, there is ‘context expansion’ in its use as a copula verb in that as it is generalised to all subjects, its frequency rises. However, the individual T features which represent tense and/or subject-agreement form subsets of copula constructions which lower the frequencies of copula verbs, the result of which is ‘context reduction’ in that the individual subject types and tenses do not outnumber the original use of *shi* as a subject determiner. The lack of morphophonological weakening in cross-linguistic examples which show morphological distinction of tense/subject-agreement is hence explained (see chapter 4, section 2).

#### Conclusion:

The diachronic frequencies between Latin *habere* (SG) and Chinese *shi* (LG) are, therefore, clear: while the former undergoes ‘context expansion’ and rises in frequency (see section 2), the latter does not (see section 3), which hence explains morphophonological weakening in the former (see chapter 4, section 1) and the lack of it in the latter (see chapter 4, section 2).

## Chapter 6: conclusions:

In this dissertation, it is proposed that formal analyses of grammaticalization distinguish between two types of grammaticalization, SG and LG, the former of which gives rise to a diachronic shift of grammaticalizing elements to their respective functional heads ('F-attraction') (see chapter 1, section 1) while the latter gives rise to a 'lateral' shift from one functional head to another ('L-shift') (see chapter 1, section 2). These formal differences seem to entail and correlate with their empirical differences, since while morphophonological and semantic weakening is common in SG, they are conspicuously absent in LG (see chapter 1, section 3), which receives a natural explanation under Bybee's model of weakening in grammaticalization (see chapter 2), which assumes an inverse proportion between frequency and morphophonological substance in grammaticalization (see chapter 2, section 1), since while 'F-attraction' (SG) gives rise to 'context expansion' and hence a rise in frequency to the grammaticalizing element (see chapter 2, section 2.2), 'L-shift' (LG) gives rise to 'context reduction' and hence a lowering of frequency to the grammaticalizing element (see chapter 2, section 2.3). I have, therefore, compared two famous case studies of SG and LG (see chapter 3), namely the grammaticalization of Latin *habere* as the Romance future tense marker (see chapter 3, section 1) and the grammaticalization of Chinese *shi* as a copula verb (see chapter 3, section 2), which displays 'context expansion' and 'context reduction' respectively (see chapter 3) and corresponding morphophonological weakening cross-linguistically (see chapter 4). The numerical analysis of the diachronic frequencies of the grammaticalizing element (Latin *habere* + infinitive, see chapter 5, section 1, and Chinese *shi*, see chapter 5, section 2) indeed shows a rise in frequency of the grammaticalizing element in SG, which corresponds to 'context expansion' (see chapter 5, section 1), and a drop in frequency of the grammaticalizing element in LG, which corresponds to 'context reduction' (see chapter 5, section 2), all of which corresponds to morphophonological weakening in SG (see chapter 4, section 1) and the lack of it in LG (see chapter 4, section 2). There is, therefore, a correlation between the frequency of the grammaticalizing element in SG and LG and their morphophonological weakening, which supports a new mechanism of syntax-phonology interface known as 'Functional Spell-Out' (see chapter 2, section 2.4). Minimalism is hence an elegant model for analysing historical syntax, since not only does it distinguish between two types of grammaticalization, it also makes seemingly correct predictions regarding their interface and empirical effects (see introduction). Much more evidence is needed to support 'Functional Spell-Out', which will be left for future research.



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