

### **3. Relative Clause *De*: Directionality, Clausal Raising and Sentence-final Particles**

#### **3.0 Introduction**

This chapter examines the structure of relative clauses in Chinese and aims to develop and defend an analysis of relativization which will be made critical use of in the examination of *shi-de* cleft structures in Chinese in chapter 4. Section 1 of the chapter considers certain very general properties of relative clauses cross-linguistically and how these have been modeled in Chinese by standard Government and Binding style analyses. Section two then goes on to examine the problem of directionality and headedness with regard to relative clause structures in Chinese, highlighting the fact that Chinese is an exceptional language which combines prenominal relative clauses with a basic V-O word order. Concerning the ‘relativizing’ element *de*, it is argued that GB analyses of *de* as a complementizer are at odds with the general directionality of Category-selection in Chinese and that there is evidence that elements in C in Chinese do indeed select for rightward complements. In section 3.3 I then attempt to show how adopting a Kaynean approach to relativization may resolve these problems, following in part a discussion of relative clauses in Simpson (1997). This Kaynean analysis is subsequently compared with an alternative approach to prenominal relative clauses suggested in Murasugi (1998) for Japanese. I argue that the Kaynean account is preferable for Chinese for three essential reasons. First it allows for a more uniform account of

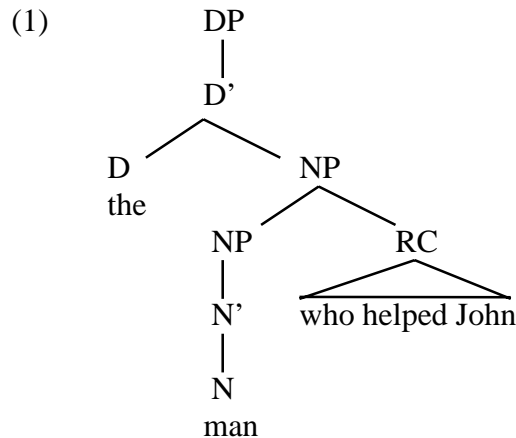
other noun-complement clause structures which make use of the element *de*. Secondly it is able to resolve the headedness/directionality issue (which is not a problem of relative clauses in Japanese). Thirdly some of the critical features of relativization in Japanese which lead Murasugi to propose a fully base-generated analysis of Japanese relative clauses are absent from relative clauses in Chinese. In section 3.4 I discuss the relevance of tone sandhi phenomena in Taiwanese for the account of relativization developed, indicating how it can be shown to provide interesting support for an analysis in which there are leftward clausal movement as part of the construction of relative clauses. Section 3.5 is an extension of the Taiwanese tone sandhi patterns discussed in section 3.4. The grammaticalization process of Taiwanese sentence-final "particle" *-kong* adds further support for the leftward clausal movement proposed for relative clauses. Section 3.6 is a brief conclusion.

### **3.1 Relative Clauses in Government and Binding Theory**

Relative clauses are standardly taken to be descriptions which semantically represent properties or sets, e.g., the relative clause: ‘who helped John on June 12<sup>th</sup> 1998’ linguistically represents the set of all (human) entities which have the property that they helped an individual named John on a certain day. Such elements are optionally combined with nouns which also represent sets (e.g., the bare noun ‘policeman’ being a property which characterizes all those human individuals with a particular profession) and in doing so simply function to pick out the intersection of the sets

represented by both noun and relative clause. Such a subset may then be combined with a determiner or other quantifier to yield a nominal phrase with particular reference, as in: 'the policeman who helped John.'

This assumption that relative clauses first combine with nominals and then with quantifier/determiner naturally leads to the view that relative clause structures have the form in (1) below.<sup>1</sup> Due to their optionality, relative clauses are syntactically taken to be adjuncts and so adjoin to NP before application of any element in D<sup>0</sup>:



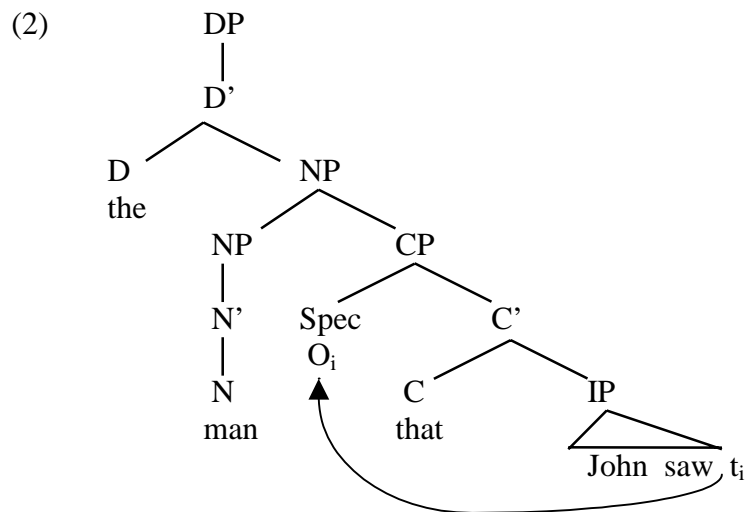
From a syntactic point of view, within Government and Binding Theory it has been widely argued that relative clauses themselves are CPs, commonly with an operator element of some type raised to the Specifier of C from a position within the IP

---

<sup>1</sup> With *non*-restrictive relative clauses such as (i) below it is commonly assumed that the head-noun first combines with the determiner/demonstrative to form a DP and this DP is then joined up with the relative clause. This encodes the intuition that in non-restrictive relative clause structures the reference of the DP is established independently of the relative clause, and the relative clause simply adds in a further property attributed to the DP (see Safir 1986 for further discussion of the interpretation of non-restrictive relative clauses). Syntactically then, the relative clause is adjoined to a full DP rather than an NP:

(i) [DP [DP that man] [RC who you met last night]]

complement of C, starting in Chomsky (1977). While this may often be an overt relative pronoun in many languages (e.g., in English), in the absence of such an overt element Subjacency tests still provide good evidence for assuming the existence of null operators undergoing the same type of movement. A simple ‘that’-relative in English may therefore be represented as in (2):



Turning to Chinese, relative clauses are found to precede the nominal element with which they are combined, the ‘linking’ element *de* occurs between the relative clause and the nominal and no relative pronoun is present. Quantifiers and demonstratives are optional:

- (3) [wo zuotian mai] de shu  
 I yesterday buy DE book  
 ‘the book(s) I bought yesterday’

The purpose of this chapter is to arrive at an analysis of how the various parts of relative clause structures in Chinese are syntactically related, i.e., how the noun head,

the actual relative clause and the functional element *de* are formally combined with one another.

If such structures do indeed have a similar underlying syntax to relative clauses in English and other languages (as e.g. represented in (1)), a first question which arises is whether there is any evidence of a null operator and null operator movement in Chinese. Although an answer to this question is not immediately obvious, Chiu (1993), (1995) presents interesting arguments that one can in fact conclude that at least a subset of relative clauses in Chinese must be formed by some kind of movement strategy and suggests a structure for Chinese relative clauses which in many ways is very close to that in (1), this also being largely endorsed by further argumentation in Ning (1993).

### 3.1.1 Chiu (1993/1995) and SuoP; Ning (1993)

Chiu (1993/1995) discusses in particular the significance of the occurrence of the element suo in relative clauses such as (4):

- (4) [Lisi suo mai \_ ] de shu  
Lisi SUO buy DE book  
'the books that Lisi bought.'

Chiu points out that there are various restrictions on the occurrence of suo (which is also always purely optional). First of all, suo may only occur if the relativized noun-head corresponds to a gap which is in *object* position:

- (5) \*[\_ suo mai shu ] de ren  
 SUO buy book DE person

Secondly, suo appears only if there is a genuine gap in the relative clause, and may not occur if a resumptive pronoun is present (Chiu notes that resumptive pronouns in object position are not liked by all speakers, but for those speakers who do tolerate them as objects, suo is not at all possible):

- (6) [Lisi (\*suo) renshi ta<sub>i</sub>] de [nei-ge ren]<sub>i</sub>  
 Lisi SUO know him DE that-Cl person  
 ‘the person that Lisi knows’

Chiu then notes certain critical interactions of suo with locality phenomena. When suo is present it is not possible for the gap corresponding to the head noun to occur either inside a Complex NP, a Sentential Subject or a *wh*-island containing a *wh*-adjunct:

- (7) \*[[Lisi suo kan \_] zui heshi ] de shu  
 Lisi SUO read most appropriate DE book  
 intended: ‘the book that it is most appropriate for Lisi to read.’
- (8) \*[[ \_<sub>i</sub> suo zu \_<sub>k</sub>] de ren<sub>i</sub> hen duo ] de nei-dong fangzi<sub>k</sub>  
 SUO rent DE person very many DE that-cl house  
 intended: ‘the house that the people who rented (it) are many’
- (9) \*[[Lisi xiang-zhidao [Akiu weishenme suo mai-le \_] de nei-ben shu  
 Lisi wonder Akiu why SUO buy-Asp DE that-CL book  
 intended: ‘the book that Lisi wonders why Akiu bought.’

From this Chiu makes the natural conclusion that relativization does indeed involve movement of an empty operator in Chinese. The effects of this movement may at times be obscured because Chinese might also seem to allow for a resumptive *pro* element to occur in islands to overcome Subjacency violations (and the equivalents on (7)-(9) are indeed acceptable if suo does not occur). However, when suo appears, the relativization strategy does indeed show itself to be fully island-sensitive. Chiu gives arguments that suo may in fact only occur in structures where movement has taken place and instantiates an Accusative Case Projection (labeled SuoP) whose overt appearance is only triggered when an object has been raised through it to some higher position. In this sense suo is highly similar to the occurrence of object agreement in French which also only appears overtly when there has been some movement of the object (relativization, *wh*-movement, passivization or cliticization, as discussed in Kayne 1975). Such an analysis is nicely supported by the fact that suo may *not* occur in the presence of an overt resumptive pronoun where movement has not taken place--example (6). Consequently it may be assumed that relativization in Chinese does indeed involve movement of some element and Chiu suggests that this element is an empty operator moving to SpecCP, just as in English that-relatives.<sup>2</sup>

In a second recent treatment of relativization in Chinese, Ning (1993) argues for similar conclusions to those in Chiu (1993/1995), but from a rather different set

---

<sup>2</sup> Note that if an object is relativized but suo does not occur, it need not necessarily be concluded that there has been no movement. In French the triggering of overt object agreement is purely optional even when there has been movement of the object. One can therefore suggest that Chinese may be similar to French and suo is optional when movement of an object takes place.

of observations. Ning again points out the fact that some cases of relativization in Chinese might seem able to violate Subjacency/the CED, licitly linking a head-noun to a position within Sentential Subjects, Adjunct Islands, and CNPs. For example, (11) is an apparent example of subjacency violation that relativize from (10). Ning argues that (11) is acceptable only because the gap in (11) can be identified as a (resumptive) *pro*; therefore there is no movement involved and thus no subjacency violation present in (11).

- (10) [na-ge xuesheng kai zhe-zhong che] shuoming ta baba youqian.  
 that-CL student drive this-type-of car show his father rich  
 'That that student drives this kind of car shows that his father is rich.'
- (11) [[t kai zhe-zhong che] shuoming ta baba youqia] de na-ge xuesheng  
 t drive this-type-of car show his father rich DE that-CL student  
 '\*the student who that (he) drives this type of car shows that his father  
 is rich'

Ning then shows that certain gaps may however not be identified as (resumptive) *pro* elements as this would violate Huang's (1982) Generalized Control Rule (GCR) on the identification and control of *pro*. This type of gaps may *not* in fact be located inside any island configuration, as for example in (12). The conclusion Ning draws is that gaps of relativization not licensed as *pro* by the GCR must indeed result from movement and therefore again that at least a substantial sub-part of relative clauses in Chinese are formed by movement.

- (12) \*[[na-ge xuesheng kai t] shuoming ta baba youqian] de na-bu che  
 that-CL student drive t show his father rich DE that-CL car  
 '\*the car which that the student drives (it) shows that his father is rich'

Ning (1993) also considers the phenomenon of so-called 'gapless' relative clauses in Chinese discussed in Tsai (1992) and elsewhere. Ning argues contra Tsai that Chinese does not in fact have relative clauses which do not contain a gap (either a gap of movement or a trace resulting from operator-movement), and provides arguments that all relative clauses in Chinese do contain some operator-variable chain. Ning suggests that structures such as (13)-(16) below result from the movement of a null wh-operator which may correspond to one of four universally available values--*place, time, manner* and *reason*:

- (13) [ta xiu che]-de cheku  
 he repair car-DE garage  
 'the garage where he fixed the car'
- (14) [ta xiu che]-de wanshang  
 he repair car-DE evening  
 'the evening when he fixed the car'
- (15) [ta xiu che]-de fangfa  
 he repair car-DE method  
 'the method how he fixed the car'
- (16) [ta xiu che]-de yuanyin  
 he repair car-DE reason  
 'the reason why he fixed the car'

Ning goes on to show that relations between a head-noun and a clause which do not fall within any of these four basic types may not license a relative clause structure, for example, neither *comitative* nor *source* interpretations of the head-noun are possible in (17) or (18):

- (17) \*[ta tiaowu]-de guniang  
he dance DE girl  
intended: 'the girl he danced with'
- (18) \*[ta lai]-de na-ge xiaozhen  
he come-DE that-cl town  
intended: 'the town he came from'

There are therefore good reasons for believing that relative clauses in Chinese are licensed by the coindexation of the head-noun with some position in the relative clause, such dependencies arising either via movement or otherwise via the linking of a base-generated *pro*, and that Chinese relative clauses are not in fact simply licensed by any 'Aboutness Relation' (as e.g. in Kuno 1973).

### 3.1.2 DE as a Complementizer

The next question which needs to be answered is: what might be the status of the element *de* in relative clause structures? It can be noted that *de* is certainly obligatory in relative clauses and in this sense might seem to be similar to the occurrence of the element that in English relative clauses where the subject position is relativized and no relative pronoun occurs:

- (19) [wo zuotian mai] \*(de) shu hen gui  
 I yesterday buy DE book very expensive  
 ‘the book I bought yesterday is very expensive’
- (20) the man \*(that) \_ helped me

In Chiu's (1993/1995) and Ning's (1993) accounts, the relative clause in Chinese is analyzed as a CP with a null operator (often) moving to the Spec position of CP, in which *de* occurs as a relativizer in the C position, just as that does in English. Such a proposal means that C must naturally be assumed to select its IP-clausal complement to the left, an assumption which has been justified in the literature on the basis of the occurrence of question particles in clause-final position--if one takes such particles to instantiate a Q-morpheme located in C, then C must be clause-final and IP to its left in Chinese:

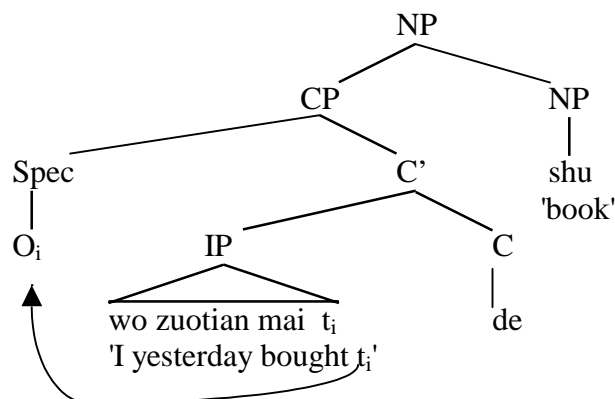
- (21) [[ Ni qu-guo Beijing] ma ] ?  
 you go-ASP Beijing Q  
 ‘Have you ever been to Beijing?’

Putting all the components of relative clause forms together and making the assumption that Specifiers uniformly branch leftwards in Chinese, one arrives at the structure in (22) representing (3), which is the analysis put forward in Ning (1993) and in somewhat more articulated form also in Chiu (Chiu has NomP in her structure in place of the IP here):<sup>3</sup>

---

<sup>3</sup> See also Audrey Li (1999b) for similar assumptions about the structure of relative clauses in Chinese.

(22)



Such a structure is very much a direct equivalent of the standard GB-type analysis of English relative clauses in (2) and has by and large been the regular approach taken to relative clause formation in Chinese for a number of years.<sup>4</sup>

In what follows, however, I would like to argue that there are reasons to prefer another type of analysis for relative clause structures in Chinese, one which is based on more recent general proposals concerning phrasal projection made in Kayne (1994). I will attempt to show both that there is empirical evidence in favor of a Kayne-based approach and that such an approach should also be favored for reasons of theoretical simplicity.

### 3.2 Directionality and C-selection--a Theoretical Problem for Standard Analyses

In this section I would like to suggest that a reason to be somewhat 'suspicious' of and disprefer a structure such as (22) is that the analysis of *de* as a C selecting an IP complement *to its left* might seem to go against the general directionality of selection

in Chinese. Although there has been considerable debate about the head-parameter setting in Chinese and some linguists (notably Li & Thompson 1974) have argued that Chinese displays the beginnings of an O-V order (in ba-construction sentences), the present general consensus of typologists, historical linguists and generativists would appear to be that Chinese neither was a head-final language in the past nor does it show real signs of changing from a basic head-initial ordering at present (see e.g. Mulder & Sybesma 1992, Sun 1996, Peyraube 1996).<sup>5</sup> Both in the lexical domain and in the functional domain one finds that  $X^0$  heads select their complements in a rightward direction, so for example verbs and prepositions consistently take their objects to the right as in (23) and (24), and auxiliaries which can be taken to occur in  $I^0$  similarly have rightward VP complements, as seen in (25):

(23) [VP [V mai [NP yi-suo-fangzi]]]  
buy one-cl-house  
'buy a house'

(24) [PP [P zai [NP wo-jia]]]  
at my home  
'at my house'

---

<sup>4</sup> Strictly speaking Ning (1993) is written from an early Minimalist rather than a GB perspective. By including it here I simply mean to contrast it with a Kaynean-style analysis.

<sup>5</sup> Though see Audrey Li (1990) and Travis (1984) for interesting discussion of alternate views.

- (25) [IP ta [I hui [VP qu Beijing]]]  
he will go Beijing  
'He will go to Beijing.'

If one attempts to suggest that the relative clause element *de* is occurring in a C position to the right of its complement IP, the directionality of this selection relation would seem to be opposite from what is otherwise attested in Chinese.

One piece of evidence given in support of the assumption that C is final in Chinese was however the occurrence of question particles such as ma/a in clause-final position, as in (26). It has been suggested that such particles occur in C and that C hence follows IP to its right. Here I would like to argue that this argumentation is not particularly strong for a number of reasons, and that it is more likely that C is initial in Chinese selecting its complement IP in a canonical rightward direction.

- (26) ni qu ma/a?  
you go Q  
'Are you going?'

The first argument against an analysis of question particles such as ma occurring in C is that similar elements occur in many other languages which are clearly head-initial and which have complementizers occurring to the left of their complement IPs. Two such languages which can be mentioned here are English and Thai (p.c., Andrew Simpson), both very regular SVO head-initial languages. In both English and Thai it is found that question particles occur sentence-finally as illustrated in (27)-(30):

- (27) You're going home, eh?
- (28) She left already, right?
- (29) wan-nii khun ca hen khaw mai? (Thai)  
 today you will see him Q  
 'Will you see him today?'
- (30) khaw ca maa meurai le? (Thai)  
 he will come when Q  
 'When is he going to come?'

The occurrence of these question particles in sentence-final position would seem to be very similar to that in Chinese, yet in English and Thai it is not possible to argue that the particles occur in  $C^0$  as  $C^0$  is IP-initial in both languages with clear complementizers occurring in positions preceding IP:

- (31) John said that [<sub>IP</sub> Mary left]
- (32) Daeng book waa [<sub>IP</sub> Dam mai maa] (Thai)  
 Daeng say C Dam not come  
 'Daeng said that Dam didn't come.'

It therefore seems that one needs to recognize that sentence-final question particles may regularly occur in surface positions which do not correspond to regular complementizer positions and that the position of ma in Chinese does not necessarily indicate the locus of C in Chinese.

A second reason to reject the idea that ma is located in C comes from the observation that ma (and other questions particles such as a) show an important

difference from question particles such as ka in Japanese which might be more reasonably located in C.<sup>6</sup> Whereas ka productively occurs in all kinds of embedded interrogative clauses such as (33), Chinese ma/a in (34), just like English right/eh in (35) and Thai particles mai/le in (36), are restricted to occurring only in root/main clauses. If ma/a are taken to be simple instantiations of C, there is no obvious reason why they should not also occur in embedded questions, as embedded clauses obviously do also contain a complementizer/C position. The root/main clause restriction on ma/a then suggests that ma/a is perhaps not in C (but perhaps in a higher matrix head) and therefore that the position of ma/a is not a good indication that C is final in Chinese:

- (33) Watashi-wa [dare-ga kuru ka] shirimasen  
 I-Top who-Nom come Q not-know  
 ‘I don’t know who is coming.’

---

<sup>6</sup> It is actually quite possible that ka is not in C in Japanese either, as ka may co-occur with the quotational complementizer to as in (i):

- (i) Mary-wa [John-ga itsu kuru ka]-to kikimashita (p.c., Yuka Kumagai)  
 Mary-Top John-Nom when come Q C asked  
 ‘Mary asked when John was coming.’

Possibly the standard complementizer domain is split into a number of heads with quotational and interrogative complementizers occurring in discrete heads in certain languages. Generally when languages allow for multiple instantiations of C in this way however, such functional heads all occur together on one particular side of the clause and hence show a single directionality relation in their c-selection, i.e., all would seem to be heads selecting their complements in the same direction, and one does not seem to find languages in which a quotative complementizer occurs on one side of a clause and an interrogative complementizer on the other. Dutch below is another example of a language with an overtly split-C system:

- (ii) Ik weet niet of dat hij komt. (p.c., Andrew Simpson)  
 I know not Q C he comes  
 ‘I don’t know whether he is coming.’

- (34) \*Ta xiang-zhidao [ni qu ma/a]  
 he wonders you go Q  
 intended: 'He wonders whether you are going.'
- (35) \*John wonders [you're going right/eh].
- (36) a. \*Daeng yaak ruu (waa) [Dam chalaat mai]  
 Daeng want know C Dam clever Q  
 intended: 'Daeng wonders if/whether Dam is clever.'
- b. \*Daeng thaam waa [khrai maa le]  
 Daeng ask C who come Q  
 intended: 'Daeng asked who came.'

Original suggestions that ma/a might be in C were made because Chinese seems to lack any obvious equivalent to the Indo-European general-purpose embedding complementizers (such as English that) which might disambiguate where C is located. However, it is not in fact true that Chinese lacks any likely candidate for C. Elements such as if and whether and their counterparts in other languages are commonly taken to be complementizers located in C, and equivalent elements do exist in Chinese, e.g., ruguo/yaoshi 'if,' etc. Significantly, such elements are found to occur clause-*initially* and so would seem to indicate that C in Chinese does indeed select its complement IP in a regular rightward direction:

- (37) [<sub>CP</sub> Ruguo/yaoshi [<sub>IP</sub> ni bu xihuan nei-ge-ren]], ni...  
 if you not like that-cl-person you  
 'If you don't like that person, you..'

Finally, Hwang (1998) notes that the verb to 'say' in Mandarin, Taiwanese and Cantonese is currently following a typical pattern of grammaticalization and becoming reanalyzed as a regular complementizer in certain environments, e.g., following cognitive verbs such as 'think' or informative verbs such as 'tell.' In such instances it is found that the newly grammaticalized complementizers linearly *precede* their sentential complements, strongly suggesting that the position of C in Chinese is in fact IP-initial rather than IP-final.<sup>7</sup> (38) contains examples of Mandarin shuo 'say' as a complementizer; the same verb in Taiwanese and Cantonese behaves the same.

- (38) a. ta xiang shuo ta bu lai le.  
 he think say he not come Asp  
 'He thinks that he is no longer coming.'
- b. ta gaosu wo shuo ta bu lai le.  
 he tell me say he not come Asp  
 'He told me that he is no longer coming.'

As a result of the above argumentation, the analysis of relative clause *de* as occurring in a C position with a *leftward* complement seems rather unlikely. All the evidence available suggests that C in Chinese selects for a *rightward* IP complement, in line with the general direction of selection in the language. Therefore it might

---

<sup>7</sup> The verb 'say' can also follow a subordinator, which itself can be considered as a C. For example, in (i), the Mandarin verb 'say' is grammaticalized as a complementizer which follows another complementizer 'if.' This can be said to be an example of multiple instantiations of C, which is discussed in footnote 5. All instantiations of C occur together on one side of the clause and hence show a single directionality relation in their selection.

seem that a different account of the positioning (and possibly syntactic category type) of *de* is called for, which may well have further consequences for the general analysis of internal structure of relative clauses in Chinese. This I now turn to in section 3.3.<sup>8</sup>

- 
- (i)      ruguo shuo ni   bu xiang qu, women jiu   bie qu le.  
           if      say you not want go   we   then don't go Asp  
           'If (that) you don't want to go, then let's not go.'

<sup>8</sup> There remains the question of where sentence-final question particles such as *ma/a* actually occur. If there is independent evidence from the positioning of elements such as *ruguo/yaoshi* that C is initial in Chinese, and abstracting away from the problem noted that *ma/a* are restricted to matrix clauses, one possibility might be that the rightward IP complement to a sentence-initial C<sup>0</sup> occupied by *ma/a* is raised (leftwards) to SpecCP in question forms giving rise to the *ma/a*-final surface word-order observed, as schematized in (i):

- (i)      [<sub>CP</sub> [ ni qu Beijing]<sub>i</sub> [<sub>C</sub> ma t<sub>i</sub> ]]  
           you go Beijing   Q  
           'Are you going to Beijing?'

An analysis along these lines has been suggested by Dominique Sportiche (1996 class lectures) for French and English intonation questions and accounts for certain facts concerning the licensing of NPIs. For example, in English it is possible to form yes/no questions both by means of subject-auxiliary inversion (SAI), and with a particular type of sentence-final intonation (a rising pattern):

- (ii)      Did you see John?                    subject-auxiliary inversion (SAI)  
 (iii)      You saw John?                        rising intonation only

However, whereas SAI questions license NPIs, intonation-questions do not:

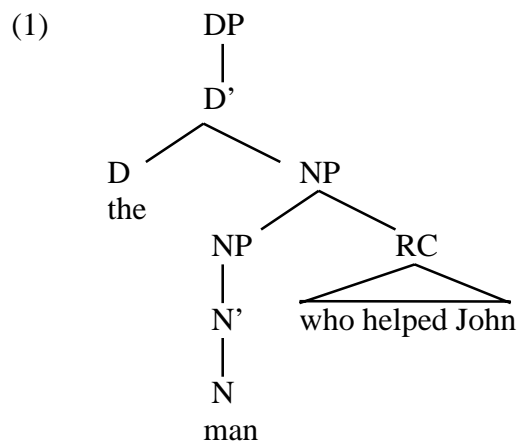
- (iv)      Did you see anyone?  
 (v)      \*You saw anyone?

Sportiche makes the standard assumption that an NPI is licensed if the Q-morpheme in C is able to c-command the NPI, and this occurs unproblematically in SAI questions such as (iv). Sportiche suggests that a possible explanation why NPI licensing fails in intonation questions is that the entire IP actually undergoes raising to SpecCP, so destroying the c-command relation between the Q-morpheme in C and the NPI in SpecCP.

In section 5 of this chapter I return to the general issue of sentence-final particles and suggest that there is actually good evidence for an IP-raising analysis with the Taiwanese S-final particle *kong*, and therefore that such an analysis might indeed be appropriate for other similar particles in Chinese too. In section 5 it is suggested that generally the surface position of phonetically reduced particle-like elements is not necessarily a reliable indication of any underlying head-complement order and the fact that such elements are phonologically dependent and enclitic may result in significant surface distortions of underlying linear order.

### 3.3 Kayne (1994) and a Uniform Theory of Relativization

Kayne (1994) develops a theory of phrase structure projection, the Linear Correspondence Axiom, which attempts to encode the idea that there can be no ambiguity in the way that terminal/head elements are linearly sequenced. One consequence of the LCA is that rightward adjunction structures may no longer be posited in any syntactic structures. Standard GB-style relative clause analyses in which CPs are taken to be right-adjoined to NPs as in English (1) repeated below therefore have to be re-analyzed by Kayne:



Kayne's solution to the problem created for relative clauses created by the LCA involves two key components. First of all it is suggested that D selects directly for a CP complement. Secondly it is suggested that the relative clause noun-head actually

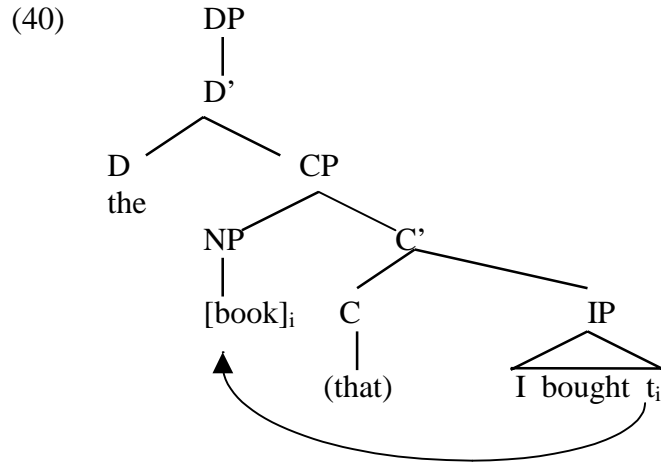
---

Note also though that Chinese S-final Q-particles do in fact license NPIs, which might seem to be puzzling given that the hypothetical IP-raising in (v) does not. I believe that an explanation here may relate to the derivational point at which IP-raising occurs. With Taiwanese *kong* there are good arguments that the IP-raising occurs at PF. If this is the case, it might be expected that such raising would *not* affect any licensing of NPIs in the IP. Possibly the IP-raising assumed by Sportiche in English and French may take place not in PF but during the syntactic derivation and for this reason block the licensing of NPIs in these languages.

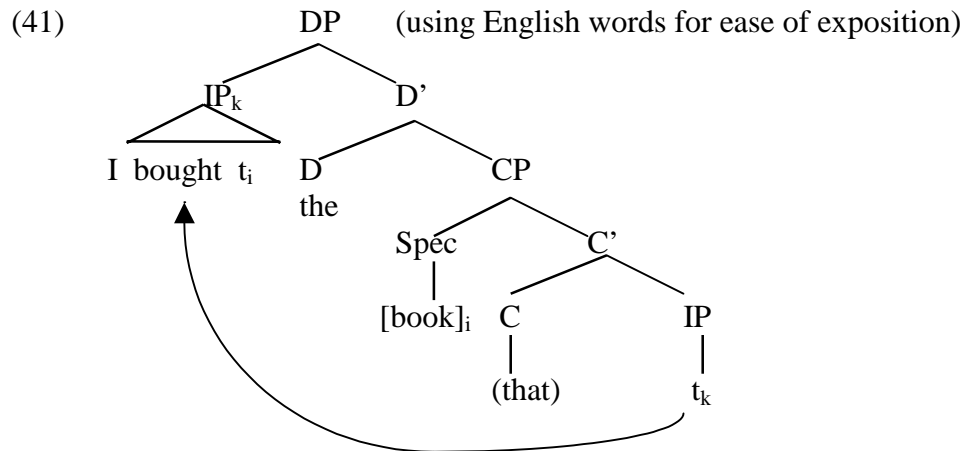
undergoes movement to its surface position from some position within the IP unit. The latter suggestion is in part justified by the observation that it allows for idiom chunks to be base-generated together and then split by the process of relativization, and is a return to a style of analysis originally put forward for similar reasons by Vergnaud 1985. In forms such as (39) below, an analysis in which the NP headway is base-generated as the object of the verb make and then raised leftwards is fully consistent with the general assumption that complex idioms must be stored in the lexicon as a single unit and introduced into syntactic structure together. Alternative null operator-type analyses of similar examples have been criticized as failing to capture the well-formedness of such idiomatic cases; it is argued that a word such as headway is listed in the lexicon *only* as part of the idiom make headway and not as an independent noun which could be taken and directly inserted as the head-noun of a relative-clause structure:

(39) the [headway]<sub>i</sub> that we made t<sub>i</sub> on the project

A simple that-relative according to Kayne is formed via movement of the NP to the SpecCP position as diagrammed in (40):



The same essential head-initial structure is then also suggested to underlie pre-nominal relative clauses in other languages, with the addition of a single extra movement raising the IP constituent to the Specifier of D as in (41):



If one were to allow movement to be able to affect C' as a constituent (although generally it is argued that X'-level constituents are invisible for the purposes of movement), then one might also expect languages to show the surface order indicated in (42), and this might in fact seem to be what is found in Amharic (p.c., R. Hayward, using English words for ease of exposition):

(42) [[that [I bought t<sub>i</sub> ]]]<sub>k</sub> [<sub>D</sub> the [<sub>CP</sub> book<sub>i</sub> [ t<sub>k</sub> ]]]]

Such an analysis essentially allows Kayne to suggest that there is a fully universal structure underlying relative clause forms in all languages, the surface differences attested being simply due to whether (and how much of) the relative clause is moved to SpecDP overtly.

Now, concentrating on the possible positions that *complementizers* can occur in in languages with prenominal relative clauses, it can be seen that they may be found either finally after the head-noun as in (41) after IP-movement, or initially as in (42), and so schematically as in (43):

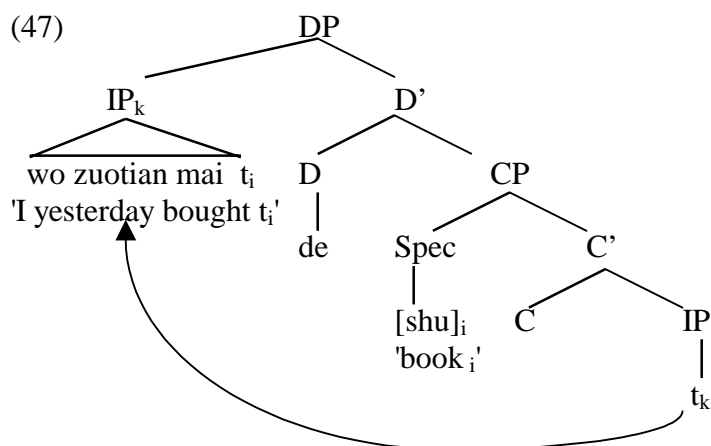
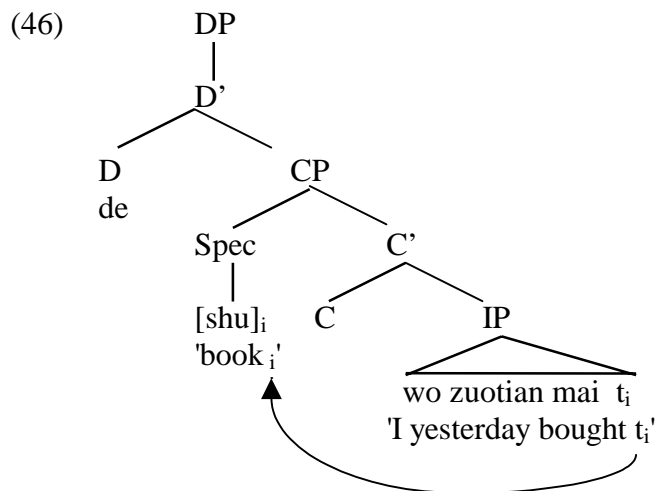
(43) (C) IP D NP (C)

(44) (that) [I bought] the [book] (that)

If one now takes the *pre-nominal* relative clauses found in Chinese, e.g., (45), and compares them with the template in (43), paying particular attention to the linear positioning of the element *de* and the possible positions of complementizers according to Kayne, an interesting discovery is made. It is found that the position which *de* occurs in does *not* correspond to any potential complementizer position. Such a conclusion is highly interesting because it is exactly what has been argued for in section 3.2. There it was suggested that it would be quite unnatural to analyze *de* as a complementizer in C and that some other analysis seemed to be required.

- (45) [IP wo zuotian mai] *de* [NP shu]  
I yesterday buy DE book  
'the book I bought yesterday'

In fact, as pointed out in Simpson (1997), it seems that the only likely category that *de* could conceivably correspond to in such structures is actually D, which is initially somewhat surprising as *de* would not seem to exhibit the standard patterning of determiner elements, neither having any obvious inherent definiteness value nor co-occurring with NPs outside of relative clause and possessor modification environments. However, rather than immediately reject the possibility that *de* may be taken to be a determiner in D, one might instead reconsider what is understood by such a term and re-examine how the notion of definiteness may be represented in a DP. This is indeed the path taken in Simpson (1997) and shortly I consider a number of the points raised in that work. Before doing so, it may be helpful to indicate how relative clauses might look in a Kaynean-style approach under the assumption that *de* is in fact located in D. Examples (46) and (47) represent the sequence of movements necessary to convert a fully head-initial structure into the surface string attested in (45). The first step in (46) is the raising of the NP which first suggested in Vergnaud (1985) and then suggested in Kayne (1994) to take place in relativization in all languages, while (47) is the further IP-raising absent from languages such as English but present in Amharic:



### 3.3.1 Determiners, Demonstratives and Definiteness Agreement

Referring to work carried out by Greenberg (1978) on African languages, Hopper & Traugott (1993) and Abraham (1997) among others, Simpson (1997,1998a, 1998b) notes that it is a fairly common process for functional elements such as determiners to pass through a number of stages of grammaticalization. Generally it is documented that determiners are initially derived from *demonstratives* after a loss of the deictic force present in such elements. For example, the French determiners le/la have been grammaticalized from the Latin demonstratives ille/illa, German der from

dieser and English the from the this/that demonstrative series. Greenberg (1978) writes that after further time determiners may then also go into a process of further decay, ultimately losing their definiteness specification with the end result that they either disappear from a language or else remain on with some additional function. As determiners undergo bleaching of their definiteness specification, it is common that languages develop some compensatory mechanism to encode the definiteness of a DP. Certain languages may make use of word order possibilities, while others may employ means such as aspectual marking on the verb to distinguish definite from indefinite DPs (e.g., Abraham 1997 on the development of determiners in German and the use of aspectual systems in Slavic languages). A third common way to compensate for the loss of definiteness specification in determiners is for a language to develop a new series of demonstrative elements in adjective-like positions within the DP. Such demonstratives are then frequently found to co-occur with determiners in a single DP representing a classic example of the typological notion of 'layering.'

Simpson suggests that this is indeed the case of Chinese *de*. *De* is argued to be a determiner which no longer has any intrinsic or overt definiteness value and which consequently may often occur 'doubled' by a demonstrative (or other quantifier) specifying the definiteness of a DP:

- (48) [wo zuotian mai]-de nei-ben-shu  
I yesterday buy DE that-cl-book  
'that book which I bought yesterday'

In more theoretical terms, Simpson suggests that the overt locus of definiteness in a DP need not always be the D position. Following the original ideas in Vergnaud & Zubizarreta (1992) developed also in Szabolsci (1994) and Longobardi (1994), it is noted that many languages would seem to have an EPP-like condition on the D position that it be overtly filled by some element prior to Spell-Out. The element filling the D position need not necessarily have any definiteness specification and could be an ‘expletive’ determiner with no definiteness value; the EPP-like condition on  $D^0$  is then similar to the clausal EPP which requires that SpecTP be filled, even if only with a semantically empty expletive element.

In languages such as English if a demonstrative is generated in the DP, this will have to occur in D. However, in other languages it seems possible to find either a demonstrative in the initial D-position *or* a determiner in D with a demonstrative occurring lower down in the DP. Such a pattern is found in Spanish, Irish, Greek and a number of other languages. Example (49) illustrates this alternation with data from Spanish taken from Giusti (1997):

- (49) a.    la reaccion alemana esa a las criticas  
           the reaction German that to the criticisms  
           ‘that/the German reaction to the criticisms’
- b.    esa reaccion alemana a las criticas  
           that reaction German to the criticisms  
           ‘that/the German reaction to the criticisms’

Data such as (49a/b) allow one to draw a number of conclusions. First it is argued in Grosu (1988), Szabolsci (1994), Giusti (1997) and various other works that

demonstratives are not in fact base-generated in  $D^0$  but actually in lower DP-internal adjective-like positions. In many languages they are suggested to undergo raising to an initial position and so appear as if they had been directly inserted into D. Other languages however show that their demonstratives will only raise to the initial position *if* no determiner has been inserted there. In Spanish for example, if no determiner is present in the initial position in (49a) the demonstrative is forced to raise to the initial position as in (49b) and it may not remain lower down:

- (50) \*reaccion alemana esa a las criticas  
reaction German that to the criticisms

This has led to the view mentioned above that determiners are often ‘place-holders’ or expletives, and that the definiteness specification of a DP may be primarily encoded by other elements such as demonstratives. Simpson (1997) points out however that it is not sufficient for just any type of D-compatible element to occur in D in the presence of a lower demonstrative, and that generally only the definite determiner is possible, as in the contrast seen in (51):

- (51) el/\*un hombre este  
the/a man this

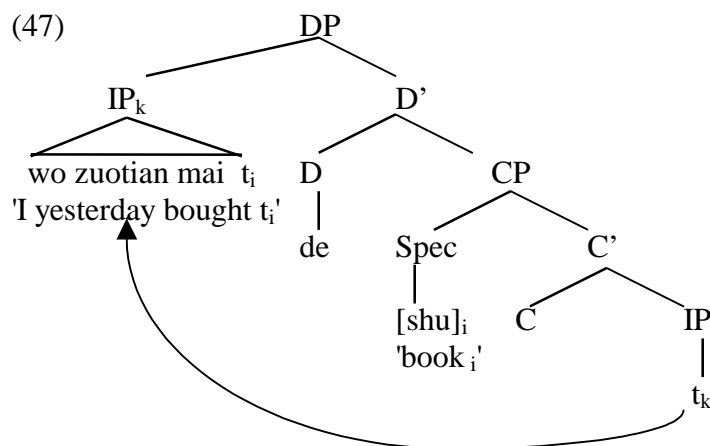
This is attributed to the existence of a requirement of ‘definiteness agreement’ or ‘definiteness concord’ between the D-position and lower elements such as demonstratives or other quantifiers.

Consequently it is argued that it is in fact rather natural to find that determiners co-occur with demonstratives within a single DP. Historically this is suggested to be due to a process in which determiners originally grammaticalized from demonstratives may gradually be bleached of an original definiteness value and then tolerate doubling by a secondary set of demonstrative elements which are the primary encoders of definiteness in the DP.<sup>9</sup> In languages such as Spanish, Greek and Romanian, the plain determiners may still maintain a definiteness value, though frequently also functioning as expletive place-holders. Chinese, by way of contrast Simpson suggests, is a language in which a determiner element occurs in D which has lost all trace of any definiteness specification, with the result that definiteness concord between the D-position and a lower demonstrative is only covertly encoded.

Such a mode of explanation allows one to make certain sense of the idea that *de* may be an instantiation of D without necessarily having any obvious definiteness value. It therefore provides a way of reconciling the distribution of elements within the relative clause in Chinese with the structure predicted by a Kaynean approach. Returning to the forms suggested by Kayne for typical prenominal relatives (as in (46) and (47)), one now might ask what motivation could be given for the suggested IP- raising operation shown in (47), repeated immediately below:

---

<sup>9</sup> For discussion of how demonstratives develop into determiners, see for example Vincent (1997). Vincent notes that demonstratives may also develop into pronouns. Latin *ille* for example, developed in two ways in modern French; the second syllable *le* of *ille* became modern French masculine singular "the" and the first syllable *il* became masculine singular "he."



Pointing out that Chinese is possibly the only language known to exhibit the combination of *pre-nominal* relative clauses and a basic head-initial/V-O order (as in Dryer 1992), Simpson suggests that any explanation of the IP-raising should be somewhat exceptional in nature and therefore necessarily related to a particular lexical item rather than being a general syntactic property (such as a parameter setting). Simpson proposes that the exceptionality present in Chinese relative clauses relates directly to the element *de* and suggests that *de* is an enclitic determiner similar in nature to the enclitic definite determiners found in Romanian, Mokilese and Buginese, attracting an element (in Chinese the IP) to its Specifier position for phonological support. Such a proposal takes its lead from Grosu's (1988) analysis of the definite determiner in Romanian. Grosu convincingly shows that the definite determiner is an enclitic which attracts an element to the DP-initial position preceding the determiner in order to attach to. The element attracted may be a noun or an adjective if present, as in (52) and (53). Cases such as (52) and (53) with the definite determiner contrast strongly with the use of the indefinite article in

(54) which is not an enclitic and does not result in the attraction of either adjectives or nouns:

(52) potret<sub>i</sub>-ul t<sub>i</sub> unei fete  
portrait-the a-Gen girl  
'the portrait of a girl'

(53) frumos<sub>i</sub>-ul t<sub>i</sub> baiat  
nice - the boy  
'the nice boy'

(54) un portret al fete  
a portrait of-the girl  
'a portrait of the girl'

So for Chinese the suggestion in Simpson (1997/1998a) which I would also now like to assume, is that *de* is an enclitic determiner very similar to ul in Romanian, and that *de* attracts the IP-clause to SpecDP to attach to it, thus giving rise to the surface distortion and the typologically very unusual prenominal ordering.<sup>10</sup>

As additional support for the *de*-as-determiner analysis, Simpson notes that there are a number of languages which visibly make use of determiners in the formation of their relative clauses, among them Lhakota, Diegueno, Tzeltal and Hebrew, a cross-linguistic patterning which indicates that it is indeed (relatively) common to find determiners in such positions.

---

<sup>10</sup> Following Simpson (1998a), it can be suggested that *de* is a D<sup>0</sup> which only selects CP complements, and therefore can not occur simply with an NP as in \**de NP*/\**NP de*. In the case of possessive forms such as *Zhangsan de* 'Zhangsan's,' Simpson suggests such sequences are not NP-*de*, but arise from relativization and the raising to Spec DP of an IP containing a null predicate of possession.

Finally I would like to point out that there is potentially strong historical support for the contention that *de* is indeed a determiner element in the D<sup>0</sup> position. Earlier it was observed that determiners frequently develop from demonstratives when the latter lose their strong deictic force. Given such a process it is now significant to note that there is in fact a direct connection between modern Mandarin *de* and an earlier demonstrative element. Commonly it is assumed that the modern Mandarin morpheme *de* developed from an earlier element zhi, which in classical Chinese had a distribution largely parallel to contemporary *de* (see for example Pulleyblank 1995). Importantly in addition to contexts such as relative clauses in which modern Mandarin *de* occurs, classical Chinese zhi was also used as a clear demonstrative (example cited from Pulleyblank 1995):<sup>11</sup>

- (55) zhi er chong you he zhi  
 these two worm again what know  
 ‘And what do these two worms know?’ (*Zhuangzi* 1.10)

If modern Mandarin *de* has indeed developed from classical Chinese zhi, and if classical Chinese zhi was a demonstrative, a highly natural analysis of modern Mandarin *de* is that it is a determiner descended from this earlier demonstrative via the common process of “definiteness bleaching.”

The end result of this is that an analysis based on a Kaynean model coupled with an account of *de* as a bleached enclitic determiner might indeed seem able to

---

<sup>11</sup> Pulleyblank notes that *zhi* could also occur as a pronoun in object positions. As the occurrence of *zhi* in (55) is clearly in subject position, Pulleyblank takes *zhi* to be a demonstrative here, not a pronoun.

accommodate the typological oddity of relative clauses in Chinese in a principled and satisfactory way which is also successful in avoiding the directionality problem faced by earlier GB-style approaches.

### 3.3.2 *Further Evidence for the NP-raising Analysis: (1) Language Acquisition: Chiu (1998); (2) Connectivity and Idiom-chunks*

In addition to providing an analysis of Chinese relative clauses which is in accord with the general direction of selection dominant in Chinese, there is also interesting language acquisition evidence discussed in Chiu (1998) which supports Vergnaud's (1985) idea (adopted by Kayne 1994) that it is the N-head which undergoes raising rather than an empty operator. Chiu observes that children produce not only relative clauses with regular resumptive pronouns but also relatives with full NPs in place of an extraction-gap (Resumptive NP Relative Clauses--RNP-RCs), as in (56):

- (56) luotuo chi caomei de caomei  
camel eat strawberry DE strawberry  
'the strawberry which the camel ate'

Following Guasti and Shlonsky (1992) in essence, Chiu suggests that the use of an empty 'linking' operator in relativization is a complex strategy which only becomes available to children at a later stage of development. Chiu suggests that children therefore initially form relative clauses via simple movement of an NP from a base-generated position within the relative clause (via SpecCP) to a surface position right-adjoined to the relative clause. RNP-RCS such as (56) occur when children

optionally spell-out both the lower extraction-site copy of the NP as well as the head of the chain, instead of just the latter:

Because linking operators are maturationally unavailable for children before the age of 6 (cf. Guasti and Shlonsky 1992), children begin forming relatives by directly moving the head noun from within the CP to its surface position, leaving an exact copy at the extraction-site. (Chiu 1998, p.18)

In addition to forms such as (56) and 'regular' relative clause structures such as (57) in which only the head of the chain is phonetically spelled-out, children also produce sequences such as (58). Chiu suggests forms of this 'head-internal' type are the result of spelling-out just the lower copy of the relativization chain:

(57) luotuo chi \_ de caomei  
camel eat DE strawberry  
'the strawberry which the camel ate'

(58) ganggang nei-ge daxiang tiao de  
just-now that-Cl elephant jump de  
'the elephant which just jumped'

Consequently such patterns would indeed seem to provide further support for an N(P)-raising account of relativization and are rather difficult to account for in analyses in which the head-noun is simply base-generated in its surface position following *de*. If the head-noun were to be base-generated following *de* and commonly associated with a gap position via an operator-trace/*pro* linking, one would expect for the argument position in the relative clause to be occupied by either just a trace, a phonologically null *pro*, or possibly an overt resumptive pronoun, but

certainly not a copy of the head-noun as in (56). The only explanation for the occurrence an overt copy of the head-noun inside the relative clause would seem to be that this is left by movement of the head-noun itself, not any operator.<sup>12 13</sup>

In addition to the above language acquisition evidence for an NP-raising analysis of Chinese relative clauses, there is further evidence from connectivity and

---

<sup>12</sup> Possibly one might attempt to suggest that forms such as (56) relate to English non-movement structures such as (i) below:

- (i) 'the strawberries such that the camel ate the strawberries'

However, such an approach could not be extended to cover cases such as (58) where there is only an NP inside the relative clause--critically there must be an external head for 'such that' clauses to be possible. The example in (ii) is an attempted 'such that'-relative clause without an external head, and is quite unacceptable, even if one adds a pronominal element such as 'those':

- (ii) ??those such that the camel ate the strawberries

To the extent that a 'such that'-relative approach to (56) cannot extend to cover related cases such as (58), a unified Kaynean/Vergnaud-type treatment of all (56-58) suggesting movement of the head-noun (and some optional deletion) is clearly to be preferred.

<sup>13</sup> Note that Chiu is of the opinion that the N(P)-raising strategy suggested to occur in children's language is actually later replaced by empty operator movement in adult Chinese. Presumably Chiu assumes this because forms such as (56) and (58) are not found in adult speech. However, one might alternatively suggest that it is the Spell-Out option which changes in adult speech rather than the fundamental relativization process, i.e., adults would continue to form relative clauses via direct raising of the N(P) as children do, but then only Spell-Out the head of the chain. Indeed in languages such as Korean forms both equivalent to head-external structures such as (57) and head-internal relatives such as (58) continue to be produced in adult speech, though William O'Grady interestingly reports (p.c. via Ruth Kempson) that there is a marked change in preference--whereas children seem to produce more head-internal relative clauses such as (58), at around the age of six they start to switch much more regularly to using head-external forms such as (57). The fact that both types of structure continue to exist in adult Korean (and Japanese) might seem to indicate that they result from stylistic (Spell-out) options associated with a single basic relativization strategy rather than being due to two fundamentally quite different strategies associated with different stages of cognitive development.

Kayne (1994) also suggests that one might expect for both head-internal and head-external relatives to occur in a single language where the relative clause linearly precedes the head-noun because (in his analysis) there will be no c-command relation between the head-internal position and the external head, and hence either of these (or in theory both) could be spelled-out, the choice being assumed to be largely stylistic (see Kayne 1994 for details).

Finally it should be noted that (contra proposals made here) Chiu assumes throughout a basic structure in which the CP relative clause is a left-adjoined to the head-noun/NP and the IP is a leftward complement to *de* in  $C^0$ , i.e., the same structure as in Chiu (1993/1995) and Ning (1993)--tree (22). The issues of directionality and selection and the categorial status of *de* discussed here are therefore left unaddressed (not being the focus of Chiu's paper).

idiom-chunks in favor of such an account. Connectivity effects occur in English relative clauses such as (59):

(59) the picture of himself that John likes the best

(59) contains an anaphor himself which must be bound in order to comply with Principle A of the Binding Theory. This requires that the anaphor must at some point be c-commanded by its antecedent John and as the NP John is located *inside* the relative clause, this would appear to mean that the NP [picture of himself] must in fact have been base-generated within the relative clause as the object of like (in which position it will be c-commanded by John) and then raised to its surface position. The existence of connectivity effects such as this has been taken to be a strong argument in favor of a Kayne-style account of relativization, and was originally discussed in earlier accounts such as Vergnaud (1985). Connectivity has been shown to be dependent upon *movement*, so that where a movement analysis is blocked, as in the Left Dislocation structure (61) compared to the Topicalization example (60), the connectivity effect disappears:

(60) [That picture of himself]<sub>i</sub> , John liked t<sub>i</sub>

(61) \*[That picture of himself] , John liked it.

Turning now to consider Chinese relative clauses, one finds that connectivity effects are also present in such structures as for example in (62):

- (62) Zhangsani<sub>i</sub> bu xihuan [na-jia chubanshe chuban de] youguan ziji<sub>i</sub> de  
 Zhangsani Neg like that-CL publisher publish DE regarding self DE  
 shu.  
 book  
 'Zhangsan does not like the books about himself that are published by  
 that publisher.'

Such patterns are clearly unexpected in an analysis in which the only element which moves is an empty operator as in (22), as then the anaphor will at no point in the syntactic be c-commanded by its antecedent. In an NP-movement analysis, however, the anaphor *ziji* will straightforwardly be c-commanded by its antecedent prior to movement of the NP *youguan ziji de shu* 'books about himself' to Spec of CP.

A similar point can be made with respect to the possibility of idiom-chunks in relative clause structures. Vergnaud (1985) notes that parts of an idiom may occur modifying the head noun of a relative clause as already noted in examples such as (39) repeated below:

- (39) the [headway]<sub>i</sub> that we made t<sub>i</sub> on the project

Given that the element 'headway' is part of an idiom 'make headway,' it has to be assumed that it is base-generated together with the verb 'make' inside the relative clause and then raised to its surface position. Again, such patterns clearly favor an NP-raising analysis over a null-operator approach which has no obvious way to account for the existence of such forms. Related patterns occur in Chinese relative clause structures as illustrated in (63):

- (63) [[ta kai t<sub>i</sub> de] dao<sub>i</sub>] dou hen chenggong. (from Audrey Li 1999b)  
he open DE knife all very successful  
'The operations that he performed were all very successful.'

In (63), *dao* 'knife' is part of an idiom *kai-dao* literally "open-knife" meaning "perform an operation." It would seem that one should therefore assume that it is base-generated together with the verb *kai* 'open' inside the relative clause and subsequently raised to the head noun position. In an empty operator analysis such as (22), one would not expect for such idiom chunks to be able to occur as head nouns in relative clauses, as in such a structure the head noun cannot be lexically inserted together with material internal to the relative clause.

Before concluding that the analysis put forward here is necessarily to be preferred to previous accounts, I will finally consider an account of relativization in Japanese which rejects a straight Kaynean approach to pre-nominal relative clauses and attempt to assess whether such an account might also be appropriate for Chinese. Arguing that the analysis developed here is actually to be preferred, in section 3.3.4 and 3.3.5 I then show how the wider patterning of complex NPs in Chinese adds further support to the Kayne-based analysis.

### 3.3.3 *Relativization in Japanese, Murasugi (1991/1998)*

Murasugi (1998) takes the original account of Japanese relative clauses which she developed in Murasugi (1991) and examines whether it might be compatible with Kayne's theory of Antisymmetry. Her conclusions, following work in Kuno (1973)

and Hoji (1985), are that there are various critical aspects of relativization in Japanese which seem to distinguish Japanese from English-type languages and render a direct translation of Kayne's proposals inappropriate for Japanese.

The first important point that Murasugi makes with regard to relative clauses in Japanese is that they do not seem to need to contain any gap corresponding to the head-noun. Similar remarks appear in a number of works on Japanese relative clauses with this property being first commented on by Kuno (1973). (64) and (65) are typical examples of what are frequently referred to as 'gapless' relatives, where it seems highly difficult to re-site the head-noun in any position within the relative clause without adding in a lot of additional material (which could not be simply deleted in the process of relativization):

(64) [John-ga hako-o nutta] omochabako  
John-Nom box-Acc painted toy-box  
'the toy box that John created by painting a box'

(65) [atama-ga yoku naru] hon  
head-Nom well become book  
'the book (by reading) which one's head becomes better'

Murasugi takes the existence of gapless relatives to be evidence against a straightforward Kaynean analysis of relative clauses in Japanese. An important aspect of Kayne's account is that the head-noun is base-generated within the IP in the relative-clause and moved to its surface position; if there arguably is no position

within the IP from which it could have originated in gapless relatives, then at least a subset of relative clauses in Japanese must be constructed without any movement.

The second point raised by Murasugi, here following Hoji (1985) is that Japanese might not seem to show the important connectivity effects which have been argued to occur in English relative clauses such as (59) in section 3.3.2. Hoji (1985) notes that the occurrence of an anaphor such as jibun modifying the relative clause head-noun in (66) seems to cause the relative clause structure to be unacceptable:

- (66) \*[John<sub>i</sub>-ga \_ taipu-shita] [jibun<sub>i</sub>-no-ronbun]  
John-Nom type-did self - Gen - paper  
lit: 'self<sub>i</sub>'s paper that John<sub>i</sub> typed'

This may then be taken as evidence that the head-noun present in relative clauses in Japanese does *not* in fact originate within the IP in relative clause structures in Japanese, and that Japanese relative clauses do not involve any Kayne-style movement.<sup>14</sup>

A third related point brought up by Murasugi concerns relative clauses in Japanese and locality. Kuno (1973), Kameshima (1989) and others have noted that the process of relativization in Japanese might not seem subject to Subjacency or the CED. Kuno gives examples of the dependency between the head-noun and a gap position licitly crossing Complex NPs, Sentential Subjects, and Adjunct Clauses:

---

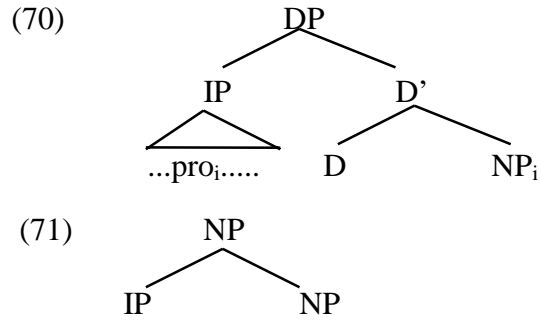
<sup>14</sup> Here however there *may* also be additional non-structural aspects of the data which contribute to the unacceptability of examples such as (66). Certain other structurally similar examples with jibun modifying the relative clause head-noun are felt to be far more acceptable, e.g:

- (67) [[ \_ kawaigatte-ita] inu-ga shinde shimatta] kodomo  
 was-fond-of dog-Nom dying ended-up child  
 ‘the child who the dog (he) was fond of died’
- (68) [watakushi-ga \_ au koto/no]-ga muzukashii hito  
 I-Nom meet thing-Nom be-difficult person  
 ‘the person who [that I see (him)] is difficult’
- (69) [ \_ shinda no de] minna-ga kanashinda hito  
 died because all-Nom was-distressed person  
 ‘the person who everyone was upset because (he) died’

Murasugi suggests that this is a further reason to believe that there is no movement involved in relative clause formation in Japanese and that a Kayne-style approach to relative clauses is therefore not suitable for Japanese.

Murasugi proposes instead that any apparent gap in a relative clause is actually a base-generated *pro* controlled by the head-noun which is also base-generated in its surface position and not moved from any other position. Referring back to a set of arguments in her 1991 thesis, Murasugi argues that relative clauses in Japanese should actually be taken to be IPs rather than CPs and then suggests the possible structure in (70), noting that this is similar in certain ways to the structure she proposed in her thesis, given in (71):

- 
- (i) [John<sub>i</sub>-ga \_ suki-na] [jibun<sub>i</sub>-no-shashin]  
 John-Nom likes selfi-Gen-picture  
 ‘the pictures of himself which John likes’



(70) is a potential reflection of the various conclusions/points argued for by Murasugi. If Japanese does not show connectivity effects and if there are fully gapless relatives in Japanese, then one need not assume that the head-noun is base-generated within the IP and it may be directly inserted in its surface position. If the lack of Subjacency/CED effects indicate that there is no movement of *any* kind, including any null operator movement, then there need not be any CP layer of structure present to host an operator in a raised SpecCP position, and the relative clause itself can be argued to be an IP-level constituent. Finally, if the head-noun is not raised to its surface position from within the IP, there is no need to assume that the IP must have been base-generated in a position to the right and lower than the head-noun as in Kayne. Consequently it is possible to suggest that the IP is actually base-generated in its surface position in Spec of DP, this essentially being an updated rather more articulated version of the 1991 base-generation analysis represented in (71). It may be noted that a somewhat similar approach is suggested for Korean relative clauses in Kim (1997), with the relative clause being base-generated in a left-branch preceding the head-noun and no movement of the head-noun being involved.

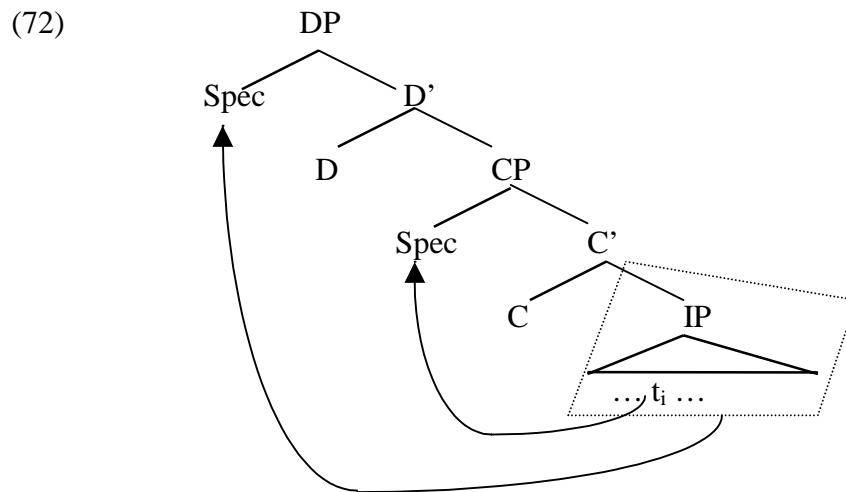
So, if there are reasons for believing that (70) may be a plausible analysis for pre-nominal relative clauses in Japanese, the question arises as to whether a fully base-generated structure such as (70) should not also be appropriate for pre-nominal relatives in Chinese rather than the Kaynean analysis proposed. I would like to argue that (70) is not suitable for Chinese on the basis of two rather general sets of arguments.

First of all, the structure in (70) arises as a possible analysis of relative clauses in Japanese as a direct result of the conclusion that there would not appear to be any movement involved in the formation of relative clauses in Japanese. This allows one to suggest that the head-noun is base-generated in its surface position rather than moved there and that the relative clause itself is simply an IP with no internal movement to any Spec of CP. In Chinese however it has been argued (in section 3.1.1) that there are in fact good reasons for assuming some kind of movement in relativization (either of an empty operator or the head-noun). In a number of very clear cases, Chiu's data relating to the patterning with suo and Ning's arguments concerning the Generalized Control Rule convincingly show that relativization in Chinese crucially is island-sensitive when one controls for and blocks the possible use of a resumptive *pro* strategy.<sup>15</sup>

---

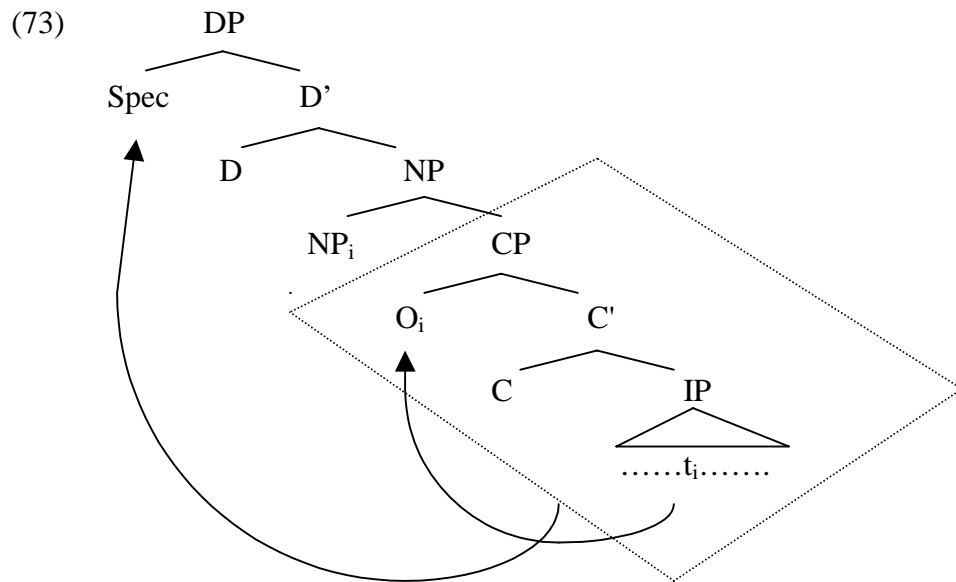
<sup>15</sup> Possibly Japanese might also show itself to be island sensitive if one could establish a similar sort of test and control. That is, maybe the apparent island violations noted in Kuno (1973) are cases where a resumptive *pro* is made use of and that there otherwise is indeed some kind of movement similar to Chinese. Possibly if the head-noun were to be a quantificational equivalent to no-one or more than two people one might find the re-appearance of Subjacency effects (a resumptive *pro* not being available in such necessarily restrictive relative environments).

Consequently there must be more to the structure of relative clauses in Chinese than indicated in (70). Either one may assume that the head-noun undergoes movement in Chinese, as in the Vergnaud-Kaynean analysis proposed earlier, or one could suggest that there is some kind of empty operator movement. Both such accounts would seem to require (70) to be non-trivially modified. If the first option is taken, then the relative clause must originate to the right of the head noun in a position from which the head-noun may undergo *raising* (i.e., one cannot assume that the head-noun is lowered from an IP base-generated in Spec of DP as in (70)). (70) will have to be modified into (72):



If the second possibility is taken, it might also seem to lead to an analysis in which the relative clause is base-generated lower than the head-noun and to its right in the structure. When there is null-operator movement rather than movement of the head-noun, the null operator must be assumed to move to a SpecCP operator position (hence the clause must be a CP rather than an IP). As it is a reasonable assumption that operators whose reference is controlled within a sentence should be c-

commanded by the element controlling this reference (as e.g. in *easy-to-please* constructions, topicalization, standard relative clause structures, etc.), this would seem to require that the relative clause CP should be base-generated in a position c-commanded by the head-noun, hence to its right in a modified form of (70), such as (73).<sup>16 17</sup> Either way, the fact that Chinese relative clauses seem to give clear evidence of movement has for effect that a base-generated structure similar to (70) can arguably not be taken to be appropriate for Chinese.



In fact, as noted earlier, it is not only the Subjacency/CED facts which appear to distinguish Chinese from Japanese, Murasugi's first argument for a non-movement analysis of relative clauses in Japanese, namely the occurrence of gapless relatives

<sup>16</sup> If the head-noun is only co-referenced with a *pro* as in Murasugi's analysis of Japanese, there is no parallel necessity for a c-command relation between the head-noun and the *pro*, pronouns in general not needing to be c-commanded by their antecedents.

such as (64) and (65), would also seem to be inapplicable for Chinese. Examples such as (64) and (65) when translated into Chinese are quite unacceptable, suggesting that Chinese does not tolerate *truly* gapless relative clauses, as indeed argued by Ning. Furthermore, as noted earlier in example (62), Chinese also displays connectivity effects which Murasugi takes to be absent from Japanese.<sup>18</sup> Murasugi assumes that such patterns are indicative of movement; their presence in Chinese but arguably not in Japanese would further seem to argue against adopting Murasugi's account of relativization in Japanese for Chinese:<sup>19 20</sup>

---

<sup>17</sup> For the surface order of the pre-nominal relative clause, CP undergoes raising to precede the head noun. At LF the raised CP will then either reconstruct to the position where the operator in SpecCP is c-commanded by the head-noun, or one might assume that a copy is left in the position from which the CP moves, this satisfying the c-command requirement.

<sup>18</sup> Such connectivity also indicates that standard GB analyses, in which an operator movement is proposed (Chiu 1993/1995 and Ning 1993 discussed above, for example), are less appropriate than the analyses with the head-noun movement.

<sup>19</sup> Another interesting difference between relative clauses in Chinese and Japanese which may be noted here concerns the positions of demonstratives and restrictive/non-restrictive interpretations. In both languages (and also Korean, which patterns like Japanese and different to Chinese, see Kim 1997) it is possible to position demonstratives either before the pre-nominal relative clause or between the relative clause and the head-noun. However, this seems to result in opposite interpretations in Chinese and Japanese. In Chinese if the demonstrative occurs between the relative clause and the head-noun, a regular restrictive interpretation is possible, but such a positioning automatically triggers a *non*-restrictive interpretation in Japanese. When the demonstrative occurs preceding the relative clause, this may give rise to a *non*-restrictive interpretation in Chinese (Huang 1982), whereas it normally results in a restrictive interpretation in Japanese (and Korean):

- (i) [wo zuotian mai]-de *zhei-ben*-shu  
I yesterday buy DE this-CL-book  
'the book that I bought yesterday'
- (ii) [watashi-ga kinoo katta] *kono* hon  
I-Nom yesterday bought this book  
'this book, which I bought yesterday'
- (iii) *zhei-ben* [wo zuotian mai]-de shu  
this-CL I yesterday buy DE book  
'this book, which I bought yesterday'
- (iv) *kono* [watashi-ga kinoo katta] hon  
this I-Nom yesterday bought book  
'the book that I bought yesterday'

The second broad piece of argumentation against a structure such as (70) and for the Kayne-based approach outlined earlier relates to the syntax of noun-complement clause structures in Chinese. Essentially it will be argued that noun-complement clause forms have an underlying syntax which is very similar to that of relative clauses, and that as the structure in (70) can be shown to be inappropriate for noun-complement clause units, it may by extension also be taken to be inappropriate for relative clauses. The line of argumentation will take its lead from significant work on the syntax of process nominals presented in Fu (1994) as well as an extension of this in Simpson (1997). After briefly describing the basic intuitions of these two works, I will then indicate how they can be shown to favor the Kayne-based account of relativization rather than any fully base-generated structure such as that in (70).

---

I do not propose to attempt an explanation of this difference here, but just note it as another example of how apparently similar surface structures in Chinese and Japanese actually seem to have quite different properties on closer examination.

<sup>20</sup> Having argued that there is good evidence in favor of a Kaynean-type movement account of relativization in Chinese, I have suggested that structures such as (46/47) represent the derivation of regular relative clauses in Chinese. For those cases in which it appears that a resumptive *pro* can be base-generated in relative clauses in Chinese (and Subjacency violated), I assume that this results from a modification of the basic movement structure in (46/47) below simply with the head noun/NP being base-generated in Spec of CP and a resumptive *pro* occurring in some position in IP. This follows the approach commonly adopted towards relative clauses with resumptive pronouns in other languages that these are simply due to base-generation of the resumptive pronoun and the relative-operator in the same relative clause positions that would otherwise be linked via movement. Such an approach seems more natural than to posit quite different structures for resumptive pronoun cases--if a relative clause movement-type structure such (46/47) is anyway necessary and available for minor modification via base-generation of a resumptive pronoun, this would seem to be simpler than to assume some different structural form.

### 3.3.4 *Process Nominals and the Structure of Noun-Complement Clause CNPs*

Noun-complement clause structures in Chinese appear very similar to relative clauses. The clausal unit precedes the selecting noun and *de* is found to occur in between these two elements:

- (74) [Deng-Xiao-Ping shishi] de xiaoxi  
Deng Xiao Ping died DE news  
'the news that Deng Xiao Ping died'

Such structures again raise the problem of the direction of selection. Elsewhere in Chinese there is consistent, good evidence that both lexical and functional heads select their complements to the right, i.e., Chinese is a descriptively head-initial language. Here however in the NP/DP the surface patterns seem to show the opposite, i.e., the complement of N seems to be selected to its left. Certain linguists (e.g., Lin 1994 and Tang 1990) have suggested that the bracketed string preceding *de* in sequences such as (74) is not in fact a complement, despite its connection to the head noun in terms of meaning. In the spirit of Grimshaw (1990) it is suggested that such elements may actually be syntactic adjuncts and so the directionality issue is not a problem after all. However, in a detailed study of the syntactic properties and structure of process and result nominals in Chinese, Fu (1994) provides convincing evidence that the elements occurring with the former type of derived nominal are indeed syntactic complements. He shows that when a process reading of these derived nominals is forced by means of duration phrases and the process verb jinxing

‘to last,’ the object of the noun head is indeed forced to appear, this being a good indication of its argumenthood:

- (75) ta ??(dui zaiqing) de baodao jinxing-le san-ge-xiaoshi  
he towards disaster DE report last-Asp three-CL-hours  
‘His reporting of the disaster lasted three hours.’ (Fu 1994)

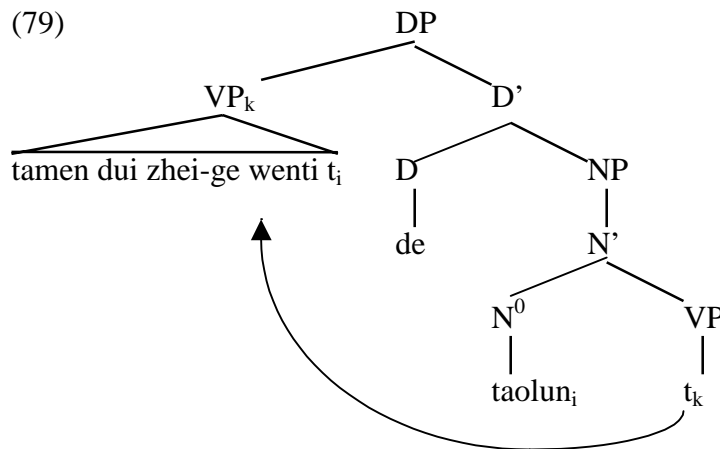
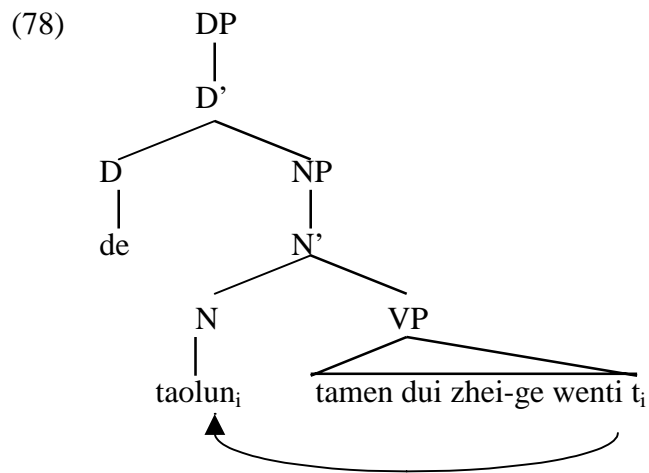
Fu also shows that with a process reading, only a single *de* may occur and this has to be placed after all of the arguments associated with the noun. Specifically, the subject argument may not be marked by *de* although one does find multiple instances of *de* elsewhere with clearer cases of adjuncts:

- (76) [Zhangsan (\*de) dui zhei-ge-anjian de diaocha] jinxing-le  
Zhangsan DE towards this-CL-case DE investigation last-Asp  
liang-ge xiaoshi  
two hour  
‘Zhangsan’s investigation of this case lasted two hours.’

Fu takes this as evidence for a process of nominalization in which the head noun (baodao in (75), diaocha in (76), etc.) is inserted as a verb in a regular verbal/clausal constituent (the bracketed string in the examples above), projecting its argument structure in a regular way inside this VP/clause, and then raises rightward over *de* to an empty nominal head position, so being converted into a nominal category. Simpson (1997) points out that such an account still leaves the directionality problem unaddressed and proposes a modification of Fu’s analysis, suggesting that the verb raises leftward to an  $N^0$  which selects for the clause in a rightward direction. This

first movement is then followed by raising of the clausal remnant to the SpecDP position, with *de* assumed to be in  $D^0$ . The derivation of a string such as (77) will then be as in (78) and (79):

- (77) [tamen dui zhei-ge wenti] de taolun  
 they towards this-CL problem DE discussion  
 ‘their discussion of this problem’



Interestingly this analysis actually results in a form closely resembling the potential surface structure for Japanese relative clauses proposed by Murasugi in (70), i.e., there is a clausal element in the SpecDP position and the noun-head is selected in a

rightward direction by  $D^0$  (which has an overt instantiation in Chinese). However, there is an extremely important difference between (79) and the form in (70). In (79) the clause is raised to its surface position from a position in which it is: (a) base-generated in a regular structural complement relation with the selecting  $N^0$ , and (b) this selection relation follows the canonical direction of selection as observed in Chinese. If the VP in (79) and other similar cases is indeed a complement of N, it should not be possible to *base-generate* it in a SpecDP position, as there is no structural relation of complementation between the  $N^0$  head and the SpecDP position (in fact there is no standardly definable structural relation between these two positions at all). Consequently a fully base-generated structure such as (70) would seem to be quite inappropriate for noun-complement clauses in Chinese, and a plausible analysis which accommodates the problem of the unexpected exceptional directionality found in such strings suggests that the complement clause is in fact raised to its surface position. Now, if there is indeed such a productive process of clausal raising to the Specifier of DP's headed by the enclitic determiner *de* (and this raising is triggered by the particular properties of *de*), this would seem to provide natural support for the analysis of relative clauses outlined earlier. In other words, if the base-generated structure (70) cannot be applied to noun-complement clause strings and a clausal raising analysis appears independently necessary to account for such structures in a theoretically undisruptive way, this same essential analysis should be available for relative clauses as well (the particular lexical properties of *de* remaining constant). Coupled with the suggestion that an operator present in the

relative clause should be c-commanded by the noun/NP which controls it, this would seem to clearly favor the derivation and representations given earlier over the possible alternative analysis in (70).<sup>21</sup>

### 3.3.5 Other Noun-Complement Clause CNPs

Before closing this section, I would finally like to suggest that structures similar to those in (78/79) but without any V-to-N-raising may be appropriate for certain other CNP types in Chinese, CNPs such as those in (80)-(83) below:

(80) [ta xue Zhongwen] de yuanyin  
 he study Chinese DE reason  
 ‘the reason he studies Chinese’

(81) [ta jiejie wenti] de fangfa  
 he solve problem DE method  
 ‘the way he solved the problem’

---

<sup>21</sup> A general question concerning the account of clausal raising outlined here is why *de* as an enclitic needs to attract a clausal constituent rather than, say, the highest XP within that clause. Although I have no great insight to offer here, it can be noted that clitics cross-linguistically do show considerable variation in the hosts which they target. In some languages clitics may attach themselves to a wide variety of hosts, whereas in other languages clitics may only tolerate a single type of host (as e.g. the pronominal clitics in French/Italian, which only attach to verbal elements, discussed in Spencer 1991). Here it can be said that *de* is also rather selective as a clitic and will only attach to verbal projections. In order to implement such an idea technically within a Minimalist approach, one can suggest that the D position is generated with a strong *v*-feature which triggers raising of some verbal constituent to its Specifier. In the case of possessive structures such as *Zhangsan de shu* ‘Zhangsan’s book’ which might seem to be a counter-example here, one might assume Simpson’s (1998b) analysis in which possessor structures result from relativization and an empty predicate of possession, as noted earlier in footnote 10. If this is so, then possessor forms will actually have the structure: [<sub>DP</sub> [<sub>IP</sub> Zhangsan <sub>i</sub> t<sub>i</sub>]<sub>m</sub> de [<sub>CP</sub> [shu]<sub>i</sub> t<sub>m</sub>]] and *de* will still be attracting an IP category.

- (82) [ta chang-chang lai Zhongguo] de shihou  
 he often come China DE time  
 ‘the time he often came to China’
- (83) [wo kanjian ta liang ci ] de difang  
 I see he 2 time DE place  
 ‘the place I saw him twice’

Ning (1993) assumes that such structures are actually relative clauses and suggests that because there is no obvious gap corresponding to the head nouns, relative clauses of this type must be formed by the movement of an empty operator (see section 3.1.1 above). If an empty operator analysis is indeed taken to be necessary for (80)-(83), such examples might be argued to constitute evidence against the general suggestion of the chapter that relative clauses are formed via raising of the NP-‘head’ in Chinese rather than resulting from empty operator movement. If one is forced to concede that an empty operator strategy might occur in this particular subset of cases, it might be objected that such a strategy might possibly also underlie all other cases of relativization (though the connectivity arguments in (62) and acquisition patterns in 3.3.2 would still remain difficult to explain for any hypothetical operator account). In defence of the proposed raising analysis of relative clauses in Chinese, the following points and suggestions can however be made. First of all it can be noted that even if one were forced to concede an empty operator analysis for examples such as (80)-(83), this would actually NOT force the conclusion that ALL relative clauses should necessarily be formed via such empty operator movement and that other cases of relative clauses might not be formed by

NP-raising as suggested. It is certainly possible that languages might in fact have more than a unique strategy for relativization. In English, for example, it is commonly assumed that relative clauses may either be created by movement or alternatively be fully base-generated when a resumptive pronoun occurs, and in Hindi Dayal (1995, 1996) suggests that three significantly different strategies of relativization are actually available. Supposing that (80)-(83) were to be formed via empty operator movement, the evidence considered here in the chapter could still be taken to support a second NP-raising analysis of other more regular relative clause structures. Secondly, there is actually a rather simple and natural way to avoid Ning's conclusion that (80)-(83) are formed via empty operator movement. Rather than automatically assuming with Ning (1993) that such structures are necessarily relative clauses, one can instead assume that they are simple noun-complement clause CNPs similar to 'the claim [<sub>CP</sub> that...]' CNPs in English and many other languages where a head noun selects a complement clause specifying its content, as in (84)-(86):

(84) the claim [<sub>CP</sub> that John was a liar]

(85) the news [<sub>CP</sub> that there was an earthquake]

(86) the rumor [<sub>CP</sub> that she was engaged]

In this second widely-available type of CNP it is regularly assumed that the head noun directly selects a complement CP and there is no relativization of an empty operator. Such a noun-complement clause strategy can also be argued to be

responsible for direct English equivalents to the Chinese cases in (80)-(83) such as (87)-(90) below:

- (87) the reason [<sub>CP</sub> he studies Chinese]
- (88) the way [<sub>CP</sub> he solved the problem]
- (89) the time [<sub>CP</sub> he came to China]
- (90) the place [<sub>CP</sub> he studies Chinese]

Note furthermore that although English allows *wh*-elements to be used as relative pronouns, such CNP forms frequently resist the occurrence of any attempted *wh* relative pronoun indicating that it must be possible for such forms to be created by the noun-complement clause non-relativization strategy.<sup>22</sup>

- (91) \*the way how he solved the problem
- (92) \*/??the second when you come here

---

<sup>22</sup> Sometimes for certain speakers a *wh* relative pronoun does seem possible, as in (i-ii):

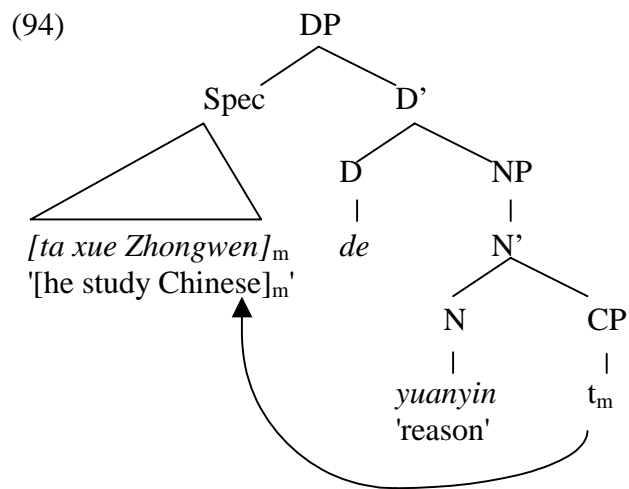
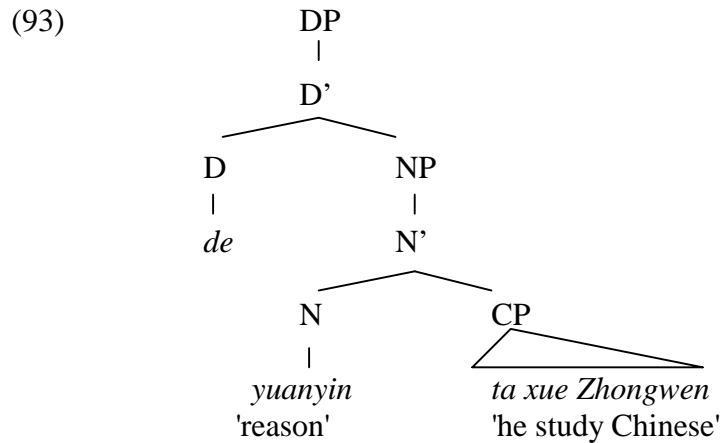
- (i) % the reason why Mary likes John
- (ii) % the time when he met Mary

Informants indicate that such forms often seem to be dispreferred in speech, that not all speakers accept them, and that in many cases overt *wh* elements are completely rejected by all speakers (such as for example (91)). I would here like to speculate that all CNPs of the type seen in (84)-(92) are formed as noun-complement clause structures parallel to [the claim [<sub>CP</sub> that...]]-forms. When *wh* elements do occur for certain speakers, they are actually occurring base-generated in C<sup>0</sup> as selected *wh*-variants to the default C<sup>0</sup> *that*, similar to the fact that C<sup>0</sup> elements are in other instances also arguably selected by embedding heads, as in (iii) and (v).

- (iii) John wonders [if/whether Mary will come].
- (iv) Bill denied [that he is in love with Mary].
- (v) Sue asked [for Bill to leave].

Consequently such structures in (i) and (ii) will again not be instances of relativization.

In Chinese, as in English, it can therefore be suggested that the clauses which occur with head nouns such as *yuanyin* 'reason' and *fangfa* 'way,' etc. can be considered to be complement clauses specifying the content of the selecting nouns in the same way that CPs occurring with head nouns such as 'news/rumor/claim' specify their content. Cases such as (80)-(83) can therefore be analyzed in a way similar to their English counterparts and in a way which is also similar to the Chinese structures (78/79), as in (93/94) below, with *yuanyin/fangfa* selecting a rightward complement clause which then undergoes raising to SpecDP to support the enclitic *de*:



Cross-linguistically this type of CNP strategy is subject to certain lexical variation and that not all (types of) head-noun syntactically license a complement clause in such a way. For example, in English ‘way’ licenses a complement CP as in (88), but the semantically similar ‘manner’ does not, as shown in (95). Note that if (88) were to be formed by a process of relativization with some kind of empty operator rather than being a complement clause structure, it is quite unexpected that such an operator-relative clause possibility should not be available when the head-noun is instead ‘manner.’ Processes of relativization should be fully blind to the lexical properties of the head noun and it should be possible to relativize any head noun if an appropriate operator is available. The fact that (95) is not acceptable therefore clearly suggests (88) is not formed by relativization. In a similar way, whereas English ‘rumor’ and ‘news’ license complement clauses specifying their content (examples 85/86), the nouns ‘sound’ and ‘smell’ by way of contrast do not, as seen in (96/97). This contrasts with languages such as Japanese and Mandarin where equivalents to ‘sound’ and ‘smell’ do indeed license complement clauses specifying their content:

- (95) \*the manner [<sub>CP</sub> that John walked]
- (96) \*the sound [<sub>CP</sub> that Bill hit the drum]
- (97) \*the smell [<sub>CP</sub> that Mary cooked the garlic]

(98) [Taroo-ga kitaa-o hiku] oto (Japanese)

Taroo-Nom guitar-Acc play sound

lit: \*‘the sound that Taroo played the guitar’

(99) [Zhangsan da gu] de shengyin (Mandarin)

Zhangsan hit drum DE sound

lit: \*‘the sound that Zhangsan hit the drum’

It can therefore be suggested that Chinese is to some extent more permissive than English, and that Chinese allows such noun-complement clause structures with a whole range of noun types, potentially specifying the content/identity of nouns in terms of reason, manner, time, place and also other sensory properties.<sup>23</sup>

---

<sup>23</sup> Note that there is also another quite simple analysis of structures such as (82) and (83) in which they can in fact be assumed to be relative clauses resulting from a Kaynean process of NP-raising. Kuno (1973) argues on the basis of a variety of data that relative clauses are commonly formed from *topic structures* and that it is the topic of a sentence which is relativized as the head-noun/NP of a relative clause. If this is so, because the head nouns/NPs in structures such as (82) and (83) can occur as topics preceding the bracketed IP as in (i) and (ii) below, it can be suggested that such NPs are relativized to their surface position from an underlying topic position and that such structures are therefore not ‘gapless’ relative clauses:

(i) nei-ge-shihou, wo chang-chang lai Zhonguo  
that CL time I often come China  
‘At that time I often came to China.’

(ii) nei-ge-difang, wo kan-guo ta liang ci  
that CL place I see-ASP him 2 time  
‘In that place I saw him twice.’

An analysis along these lines would consequently seem to allow one to maintain that Kaynean-type NP-raising does occur also in cases where there is perhaps no obvious gap in the relative clause--the extraction gap of the NP would actually be in the topic position.

Note that in such an approach, examples such as (80) and (81) would however still have to be analyzed as being N+ CP complement structures, as the nouns *yuanyin* ‘reason’ and *fangfa* ‘way/method’ cannot occur as topics connected to the relative clause IP as in (iii) and (iv):

(iii) \*nei-ge yuanyin, ta qunian xue zhongwen  
that-CL reason he last-year study Chinese

(iv) \*nei-ge fangfa, ta jiejué wèntí  
that-CL method he solve problem

### 3.4 Taiwanese Tone Sandhi and the Clausal Raising Hypothesis

In this last section I would like to present a further set of evidence in favor of the basic account of relative clauses suggested here, based on the phenomenon of tone sandhi in Taiwanese. I will argue that a certain tone sandhi patterning occurring in relative clause structures in the Taiwanese dialect of Chinese can be given neat explanation if one indeed assumes the approach to relativization proposed here. I will also argue that this patterning remains puzzling and unaccounted for in a GB/Murasugi-type base-generation analysis. In order to make such arguments, it will first be necessary to provide a very brief background sketch of basic tone sandhi phenomena in Taiwanese and then turn to relative clauses in particular.

#### 3.4.1 *Tone Sandhi Patterns in Taiwanese*

Taiwanese is a variety of Chinese with eight tones:<sup>24</sup> The 1<sup>st</sup>: high-level 5-5, the 2<sup>nd</sup>: high-falling 5-1, the 3<sup>rd</sup>: low-falling 2-1, the 4<sup>th</sup>: low-entering tone (a syllable with a final stop), the 5<sup>th</sup>: contour-tone 2-1-4, the 6<sup>th</sup>: high-falling 5-1 (the same as tone 2), the 7<sup>th</sup>: mid-level 3-3, the 8<sup>th</sup>: high-entering. In addition to these eight (actually seven) tones there are also syllables which do not carry any tone, this sometimes being referred to as ‘neutral tone’ (NT). In the phenomenon of *tone sandhi*, the lexically-listed tone of a syllable is generally able to undergo modification according to fully regular rules when preceding some other tone-bearing syllable in the same

---

<sup>24</sup> Two of the ‘eight’ traditionally recognized tones, tone2 and tone6 are actually identical in phonological terms--both are high-falling 5-1.

tone sandhi domain. For example, if a syllable with tone 1 precedes another tone-carrying syllable, the tone 1 may change into a tone 7, as illustrated in (100):

- (100) **khi3** pak8kiang1 → **khi2** pak8kiang1  
 go Beijing  
 ‘go to Beijing’

Table (101) below shows how the full range of these modifications are made. Note that the changes in tone are not triggered or conditioned by the particular type of tone that the following syllable carries, hence a syllable with tone 1 will change its tone to tone 7 no matter whether the following syllable has tone 1, 2 or 3, etc.; the essential requirement for tone sandhi to apply is that the following syllable have some type of lexical tone rather than just ‘neutral tone.’

- (101) a. 1<sup>st</sup> → 7<sup>th</sup>  
 b. 2<sup>nd</sup> → 1<sup>st</sup>  
 c. 3<sup>rd</sup> → 2<sup>nd</sup>  
 d. 4<sup>th</sup> → 8<sup>th</sup> when the syllable ends in p/t/k; → 2<sup>nd</sup> when the syllable ends in a glottal stop  
 e. 5<sup>th</sup> → 7<sup>th</sup> (southern Taiwan); → 3<sup>rd</sup> (northern Taiwan)  
 f. 6<sup>th</sup> → 1<sup>st</sup>  
 g. 7<sup>th</sup> → 3<sup>rd</sup>  
 h. 8<sup>th</sup> → 4<sup>th</sup> when the syllable ends in p/t/k; → 3<sup>rd</sup> when the syllable ends in a glottal stop

Basically, a high-level tone will become a mid-level tone, a mid-level tone will turn into a low-falling tone--in both cases a ‘down-grading’ of the tonal value; if a tone

occurs at the bottom end of the tonal system, tone sandhi will convert it back up to the top of the tonal group--e.g., a low-falling tone will become a *high-falling* tone (and a low-entering tone becomes a high-entering tone, and high-entering tone becomes a low-entering tone).

As mentioned just above, tone sandhi may not occur in a syllable if it precedes a syllable which has only neutral tone/no tone. Consequently *zau* in example (102) may not change its tone-2 when occurring before the toneless element *a* in (102):

- (102) **zau2** a-NT → **zau2** a-NT  
run already  
'already left'

Similarly, a syllable may not undergo tone sandhi if it occurs sentence-finally. This is due to the fact that tone sandhi is restricted to apply within certain specific domains. In (103) below, the citation tone-2 of sentence-final *ho* may not be converted into tone-1 even though followed by a syllable (A-hui) which does carry tone because this latter syllable occurs in a separate sentence. Note that from this point on for simplicity of representation I will indicate tone sandhi change by means of a simple bolded dot following the relevant syllable. Thus if a syllable is followed by a bolded dot, this indicates that it undergoes tone sandhi change, and if a dot is absent, no tone sandhi change is possible. In (103) sentence-final *ho* is therefore not followed by a dot as no tone sandhi change can occur in sentence-final position:

- (103) A•-sin chin• **ho**. A•-hui ma• chin• ho.  
A-sin very good A-hui also very fine  
'I am fine, and my father is also fine.'

Sentence-internally there would also seem to be other tone sandhi/TS domains relevant for the operation of tonal change, and broadly-speaking every syllable in such a domain will change its tone unless it is the last tone-bearing syllable. Significantly, tone sandhi change in Taiwanese appears to relate to and reveal the underlying syntactic structure in a way which is not found in tone sandhi phenomena in Mandarin, Shanghainese and certain other varieties of Chinese. For present purposes it is important to point out the following three significant generalizations:

- (104) **Generalization A: a head and its complement occur in the same TS domain**

The presence of an overt complement consistently triggers tone sandhi change on the selecting head, indicating that a head and its complement are in a single TS domain:

- (105) a. V-NP<sub>object</sub>  
**be•** [Ing•-pun• chhe]  
 buy two-Cl books  
 'buy two books'
- b. P-NP  
**tui•** [goan• lau•pe]  
 to my father  
 'to my father'
- c. Aux/I-VP  
**e•** lai  
 will come  
 'will come'
- d. Comp-IP  
 na•**si•** [A•sin m• lai]...  
 if Asin neg-want come  
 'If Asin is not coming...'

(106) **Generalization B: a head and its Specifier do not occur in the same TS domain**

It is found that a head does not trigger tone sandhi change on the final syllable of its Specifier. Consequently the Specifier of a head constitutes an independent TS domain. In (107) below, the final syllable of the subject does not change its tone, despite being followed by the tone-bearing head *u* 'have':

- (107) [A•-sin] u• lng• chhing• kho  
**A-sin have two thousand dollar**  
 'A-sin has two thousand dollars.'

In addition to (107) above with the final syllable of a subject in SpecIP failing to undergo tone sandhi, further examples of Specifiers being isolated TS domains are given in (108) and (109) below, where the DP *tai-oan-oe* ‘Taiwanese’ occurs as either a moved or base-generated topic relating to the object position. In such a Specifier position, its final syllable *oe* does not undergo any tone sandhi change:

- (108) A•-sin [tai•oan•oe] be• hiao• kong  
A-sin Taiwanese not know speak.  
‘Taiwanese, A-sin can’t speak.’
- (109) [tai•oan•oe] A•-sin be• hiao• kong  
Taiwanese A-sin not know speak.  
‘Taiwanese, A-sin can’t speak.’

(110) **Generalization C: adjuncts are self-contained TS domains**

The final syllable of an adjunct does not undergo tone sandhi even when followed by other tone-bearing syllables. This is illustrated below with the case of a CP adjunct. No tonal change in its final syllable is possible:<sup>25</sup>

- (111) [na•si• A•sin m• khi], A•hui ma• be• khi  
if Asin neg go Ahui also Neg go  
'If Asin is not going, Ahui will also not go.'

### 3.4.2 *Tone Sandhi in Taiwanese Relative Clauses*

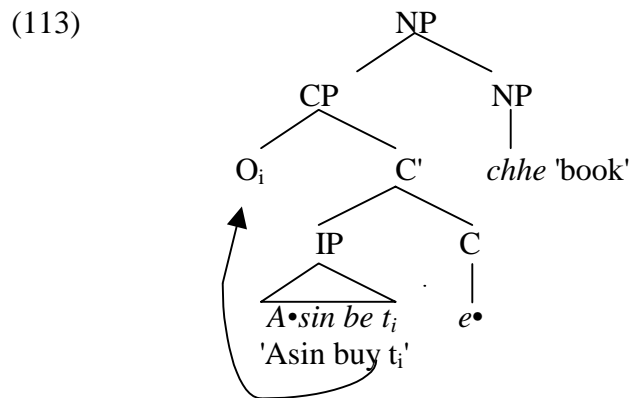
Turning back to relative clauses now, there are certain critical aspects of their tone sandhi patterning in Taiwanese which argue against a standard GB-type account of

---

<sup>25</sup> Note that a quite different approach to the description of tone sandhi generalisations is offered in R. Cheng (1968/1973). Rather than stating (Taiwanese-type) Min dialect tone sandhi as a set of phonological rules which applies to major syntactic units as input (i.e. specifiers, heads, complements and adjuncts), Cheng suggests that such tone sandhi is instead sensitive to the particular *categorical type/label* of a syntactic constituent, and that tone sandhi is a process which is blocked and fails to apply if a syllable occurs specifically at the end of an NP, a VP, IP, sentential AdvP or CP. Such a categorial-based approach is however strongly criticized in Chen (1985). Chen vigorously points out that truly productive phonological processes such as tone sandhi are nowhere else found to be directly sensitive to and restricted by particular categorial labels and phonological rules instead seem to be blind to categorial distinctions (for example, one never finds cases of other phonological processes such as vowel harmony, palatalisation, spirantisation etc being restricted by categorial type and therefore only occurring in AdjPs or PPs, or NPs and AdjPs etc, although such processes may be subject to other more general boundary conditions). Chen argues that it would be consequently quite implausible to assume the exceptional existence of rules which do refer to a subset of such labels just in the case of Min tone sandhi. In contrast to the lack of such category-specific phonological rules however, Chen notes that cross-linguistically there are many phonological processes which are sensitive to *more general* syntactic divisions in sentential structure, indicating that phonology (potentially) does recognise distinctions between arguments and adjuncts and other major syntactic relations, and that such more general distinctions are more likely to be relevant for Min tone sandhi. I fully agree with Chen's argumentation that phonological rules should be assumed to be unable to refer specific category labels and would also like to thank Monik Charette, Moira Yip and Jean-Roger Vergnaud for useful discussion and confirmation of this point. The chapter consequently continues to assume that Taiwanese tone sandhi is indeed a function of more general syntactic structure and the generalisations relations suggested in the text and is not a result of categorial labels. For further discussion of how Min tone sandhi patterns are sensitive to argument/adjunct type syntactic relations, see Chen (1990) and also Chen (2000).

their structure. A simple relative clause in Taiwanese and the structure that such a form would be naturally assigned under Ning's (1993) and Chiu's (1995) analysis of Chinese relative clauses is illustrated in (112) and (113). In (113) the functional element *e* (=Mandarin *de*) is analyzed as a relativizing complementizer in C similar to English that (following the Ning/Chiu assumption that Mandarin *de* is a  $C^0$ ), and the CP relative clause is taken to be left-adjoined to the final NP (again as in the Ning 1993/Chiu 1995 analysis of Mandarin Chinese):

- (112) [<sub>IP</sub> A•sin **be**] **e•** [<sub>NP</sub> **chhe** ]  
 Asin buy Rel book  
 'the book Asin bought'



Considering forms such as (112), three fully general and important tone sandhi facts can be noted:

- (114) a. The (final syllable of the) head-noun does not undergo tone sandhi.
- b. The functional element *e* does undergo tone sandhi.
- c. The final element in the IP preceding *e* does not undergo tone sandhi.

Taking these properties one by one and reflecting on how they might be accounted for in a structure such as (113), it is found that the first property (114a) (that the final syllable of the head-noun does not undergo tone sandhi) is not difficult for a GB-style analysis to explain. Above in (103) and (106) it has been noted that the final syllable of a sentence and the final syllable of a Specifier do not undergo tone sandhi. If relative clause forms such as (112) then occur either sentence-finally as objects or as subjects in a specifier position it is expected that the final syllable in the structure will not undergo tone change.

Property (114b) however is very difficult for a GB-style account to explain. If one assumes an analysis such as (113), in which *e* heads a CP left-adjoined to the NP/head-noun, it is unexpected that the functional element *e* would change its tone. Note here that the Taiwanese element *e*, unlike Mandarin *de*, does indeed carry a tone; its lexically-listed citation tone is tone 5, and this undergoes tone sandhi modification when preceding a (tone-bearing) head-noun to tone 7. In (111) it has been noted that CP adjuncts constitute their own isolated tone sandhi domains and tone sandhi does *not* take place between the final syllable in a CP adjunct and the element it is adjoined to. Consequently, if the relative clause is assumed to be a CP adjunct as in (113) it should *not* be possible for the head-noun to trigger tone sandhi

leftwards onto the the last syllable of the CP adjunct--*e*, yet *e* clearly does change its tone.

Property (114c) is also quite unexpected in an analysis such as (113). If the IP-clause is taken to be a leftward *complement* to the functional *head e* in  $C^0$ , then this IP and *e* in  $C^0$  should constitute a single tone sandhi domain. In (104) it was noted that the presence of an overt complement consistently triggers tone sandhi on the selecting head, and in (105d) it was seen that a  $C^0$  head and its IP complement constitutes a tone sandhi domain and therefore every syllable but the last syllable in the domain should change its tone. This being so, and given that Taiwanese *e* is a genuinely tone-bearing syllable, it is expected that the  $C^0$ -element in (113) should be able to trigger tone sandhi onto the last syllable of the preceding IP-complement--the verb 'buy,' but this is *not* possible.<sup>26</sup>

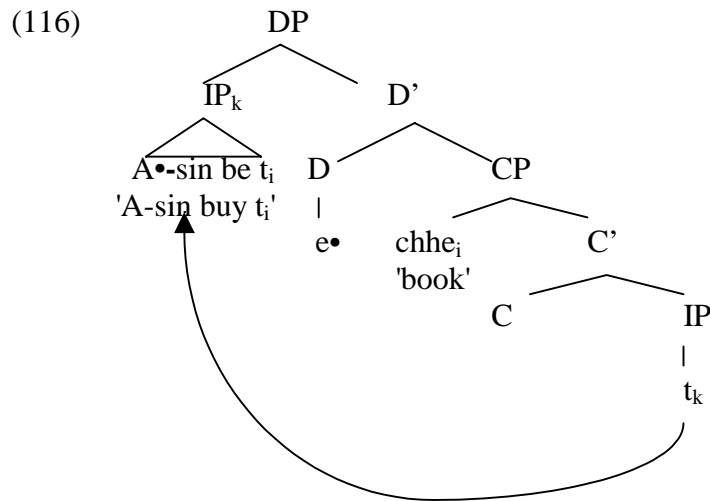
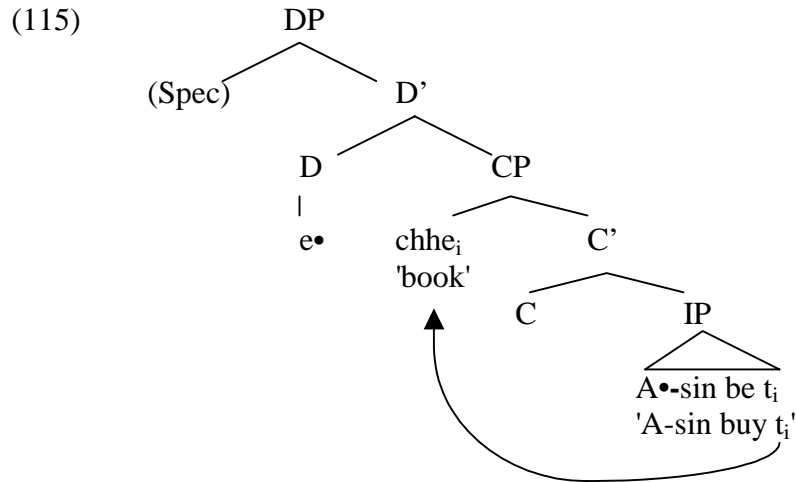
There are consequently good reasons to doubt the correctness of the GB-type analysis of Chinese relative clauses as illustrated in (113). The Kaynean-type

---

<sup>26</sup> One might perhaps wonder whether an alternative account of the patterning might be possible, relating it to the paradigm of *wh*-trace interference in *wanna*-contraction where the occurrence of an A'-trace between two elements blocks the phonological process of contraction from occurring (i.e., *\*Who do you wanna win?* is unacceptable as the A'-trace of who occurs between want and to). Movement of an empty operator to Spec of CP might leave behind a trace of A'-movement which would linearly intervene between the element targetted for tone sandhi application be 'buy' and the following tone-bearing element potentially able to license tone sandhi (*e*). This A'-trace intervention could then possibly be held responsible for the impossibility of tone sandhi in the verb be. However, tonal change on the final element in the IP is equally impossible when a subject is relativized from within the IP and no trace intervenes between the final IP element and the  $C^0$  *e*, as in (i).

- (i) [ O<sub>i</sub> t<sub>i</sub> be• chhe] e• lang  
       buy book e person  
       'the person who bought books'

analysis of relativization in Chinese argued for earlier by way of contrast is indeed able to explain all of the tone sandhi patterns observed without any of the difficulties found in the more traditional analysis in (113). (115) and (116) are representations of the hypothetical derivation of Taiwanese (112) in a Kaynean analysis:




---

It would therefore seem that it is not the occurrence of an A'-trace before *e* in (112/113) which blocks it from licensing tone sandhi (one can also note that A'-traces in fact do *not* seem to block contraction processes in any clearly uniform way--Sag & Fodor (1995) observe that the *wh*-trace resulting from extraction out of *tensed* subject positions does not block auxiliary contraction: *Who do you think'll's come?*).

First of all, property (114a) that the NP chhe 'book' does not show any tone change can be simply assumed to be due to one of the two facts. First it occurs in a Specifier position, Spec of CP, and the final syllables of elements in Spec positions do not undergo any tone sandhi change as per (106). The second fact is that the NP 'book' is linearly final in the whole DP which itself may occur as an object sentence-finally or as a subject in a Specifier position, and neither of those positions allow its final syllable to undergo tone change.

Secondly and more significantly, (115/116) are able to account for property (114b), the fact that the functional element *e* undergoes tone sandhi. In the GB analysis this is a problem because *e* occurs in a CP *adjunct* and so should not be visible outside this domain for any tone sandhi operations. In the structure in (115/116) however, no adjunct relation is present, and *e* is instead a D<sup>0</sup> selecting a rightward complement. As a head and its complement occur in a single tone sandhi domain and complements consistently cause tone changes in their selecting heads, it is actually very natural that the element following *e* in its complement CP does trigger tone sandhi on *e*.<sup>27</sup>

The third property (114c) is also importantly explained, namely that the final element in the IP of the relative clause (the verb be 'buy') does not undergo tone

---

<sup>27</sup> Note that if there is no overt NP following *e*, then *e* does not undergo tone sandhi, as shown in (i):

- (i)      [IP A•sin be] e• [NP \_ ]  
           Asin    buy Rel  
           'the one(s) Asin bought'

sandhi. In the GB analysis this is unexpected because this element is assumed to be in the unmoved complement IP of the  $C^0$  head instantiated by  $e$  and so the  $C^0$  should trigger tone sandhi on the preceding element be 'buy.' In (115/116) however, the IP is analyzed as being base-generated as the rightward complement of a phonetically null  $C^0$  and then raised to its surface position in SpecDP, where  $e$  actually instantiates  $D^0$ . Occurring in a Spec position, it is fully expected that the IP will constitute an isolated tone sandhi domain and that the final syllable in such a constituent (i.e., the verb be 'buy') should *not* undergo any tonal change.

Consequently then, it would seem that there is good evidence from tone sandhi supporting a Kaynean analysis of relative clauses in Chinese of the type outlined in the chapter here. Whereas a more traditional GB approach to relativization in Chinese assuming *de/e* to be an instantiation of a  $C^0$  selecting a leftward complement IP is arguably unable to account for the patterns of tonal change revealed in Taiwanese, a uniformly right-branching analysis of relative clauses with *de/e* taken to be in  $D^0$  provides a principled and natural account which accords with other general patterns of tone sandhi phenomena productively observed in the language. To the extent that such evidence therefore further bears out the Kaynean analysis already justified on other grounds, it might seem that such an

---

This confirms that the tone sandhi rules apply *after* the IP has undergone raising to SpecDP as otherwise the presence of the IP following  $e$  might be expected to trigger tone sandhi on  $e$ . The IP-raising therefore can be assumed to take place in the syntax and not be movement at PF (i.e. after the application of tone sandhi).

analysis is indeed well able to capture the diverse range of properties associated with relative clauses in Chinese.<sup>28</sup>

### 3.5 Extensions: Grammaticalized Complementizers in Taiwanese

Before concluding this chapter centered mainly on the syntax of relative clauses in Chinese, I would like to suggest that ideas on the interaction of tone sandhi and syntax presented above in section 3.4 can also account for a second interesting phenomenon in Taiwanese--the grammaticalization of a verb of saying '*kong2*' as a complementizer in an unexpected sentence-final position. This section will also attempt to show how sentence-final particles in head-initial languages may quite generally come into being as the result of processes of grammaticalization, and addresses directly the important issue of directionality and surface linear ordering in CP-type constituents in Chinese. Finally, the section will also argue that the paradigms investigated provide evidence for Chomsky's (1998) idea of Cyclic Spell-Out.

Earlier in section 3.2 it was noted that cross-linguistically it is fairly common for certain very general verbs of communication (typically equivalents to English

---

<sup>28</sup> It could perhaps be argued that the tone sandhi patterns here might also be explained if a slightly adapted version of the Murasugi-type structure in (70) is adopted with the relative clause base-generated in SpecDP. In such a structure no tone sandhi change would be expected on the final element in the IP preceding *e* as this would be occurring in a Specifier (SpecDP) and *e* itself would be expected to undergo tone sandhi change as it would be a D<sup>0</sup> head preceding an overt NP complement. However, earlier arguments given against such an analysis are still valid here. Because there is evidence of movement in Chinese relative clauses, it must be assumed that a CP is projected with some element raising to SpecCP; if this is assumed to be an empty operator rather than the head-noun, such an operator will need to be c-commanded by the head-noun and so the CP should be base-generated to the right of the NP in structure (70). Consequently it should *not* be possible to base-generate the CP relative clause in SpecDP and, as before, a Murasugi-type structure has to be rejected

'say') to undergo grammaticalization as complementizers when they occur after other more specific verbs of communication or cognitive state such as 'yell,' 'answer,' 'inform,' 'think' or 'believe.' Frequently this occurs when a language has serial verb constructions which allow for a sequence of two verbs of communication (one more specific the second less specific) to become reanalyzed as a sequence of verb + complementizer, schematically as in (117):

(117) Verb1 Verb2 → Verb(1) Complementizer  
 shout say shout that

What is of particular interest and relevance here is the position of the verb 'to say' when it becomes grammaticalized as a complementizer. The cross-linguistically common pattern is for the grammaticalized complementizer to occur in the same position that the earlier fully verbal form occurred in. In the many head-initial SVO languages of West Africa and S.-E.Asia which show this type of grammaticalization this means that the new complementizer will occur *preceding* its clausal complement. In Thai (p.c., Andrew Simpson) for example, the morpheme *waa* is currently both a verb meaning 'to say' as seen in (118) and also grammaticalized as a complementizer preceding its IP complement as in (119). The fact that *waa* may co-occur with verbs of cognition such as *khit* 'think' in (119) no longer with its literal meaning 'to say' is evidence that *waa* has indeed grammaticalized as a complementizer in such positions and is no longer just a verb-in-series. Such an

---

(for Chinese).

assumption is further supported by the observation that *waa* may now also occur after *nouns* as in (120), which shows that *waa* is no longer a verb 'say':

(118) kae waa arai?  
you say what  
'What did you say?'

(119) khaw book/khit waa Daeng suay  
he say/think that Daeng be-pretty  
'He says/thinks that Daeng is pretty.'

(120) kham-phaasii waa 'tham bun dai bun'  
proverb that do good get good  
'the proverb (that) 'If you do good, you will receive goodness.''

In West African Ewe (Heine & Reh 1984: p.252) it is found that the verb *be* 'say' grammaticalized as a complementizer no longer occurs with the tense-aspect markings or pronoun prefixes which would otherwise be normal for real verbs in serial verb constructions, again indicating rather clearly that a category change from verb to complementizer has taken place. Similarly in Twi (Lord 1993: p.176) the verb *se* 'say' occurring as a complementizer also now no longer takes verbal affixes such as negation concord which would otherwise occur with verbs-in-series, confirming as with Ewe and Thai that a category change from verb to complementizer has taken place.

In Mandarin Chinese and Cantonese, Hwang (1998) argues that the same type of grammaticalization is taking place, and as Mandarin (121) shows, the verb *shuo* 'to say' occurs following a verb of cognition. As in Thai (119), this element in

(121) no longer has its original verbal meaning of ‘saying’ but instead appears to be functioning as a general embedding complementizer element:

- (121) Zhangsan xiang shuo Lisi bu lai le (Mandarin)  
Zhangsan think that Lisi NEG come ASP  
‘Zhangsan thinks Lisi is no longer coming.’

Examples such as (121) are important, as they show that where a complementizer/ $C^0$  is developing in Chinese, it occurs in a pre-IP position and hence conforms with the otherwise head-initial pattern in Chinese preceding its complement. As noted briefly in section 3.2, where other suggestions have been made that CP is a head-final projection in Chinese, this has been based on the occurrence of sentence-final question particles and the assumption that Chinese has no other regular instantiations of  $C^0$  equivalent to English ‘that.’ Here however one finds that a fairly simple equivalent to English ‘that’ is indeed beginning to occur and significantly it identifies CP as being head-initial and quite regular in its directionality.

A similar pattern also occurs in Taiwanese, and one finds that the verb *kong* occurs following other verbs of communication and verbs of cognition as in (122):

- (122) A•-hui siong• **kong**• A•-sin m• lai  
A-hui think KONG A-sin NEG come  
‘A-hui thought that A-sin was not coming.’

Again, as with Thai *waa* and Mandarin *shuo*, the fact that *kong* occurs without its normal verbal meaning of ‘saying’ with verbs of cognition strongly suggests that it

has grammaticalized away from its original verbal source. This is confirmed by the fact that the verb preceding *kong* can take an aspectual suffix, while *kong* is in such a position that cannot occur with any aspectual suffixes, suggesting that *kong* in these instances has indeed undergone a category change from verb to some other non-verbal category and now occurs as a complementizer:<sup>29</sup>

- (123) a.    goa   bo•   siong•-koe kong•   A•-sin   m•   lai  
               I   haven't think-Asp KONG A-sin NEG come  
               'I haven't thought that A-sin was not coming.'
- b.    \*goa   bo•   siong• kong•-koe A•-sin   m•   lai  
               I   haven't think KONG-ASP A-sin NEG come

This position preceding the embedded IP in (122) is precisely where one would expect to find *kong* occurring as a grammaticalized complementizer, and *kong* as a new C<sup>0</sup> here seems to be fully parallel to Mandarin *shuo*, Thai *waa* and equivalents in other SVO serializing languages. However, in addition to forms such as (122), another arguably more interesting pattern is found with *kong*, as briefly noted in the introduction. For no immediately clear reason, the same element *kong*

---

<sup>29</sup> Note that Mandarin (i) below is perfectly acceptable with aspectual *-guo* attached to *ting-shuo* 'hear-say.' This indicates that Mandarin *shuo* in the sequence *ting-shuo* is still verbal:

- (i)        wo mei ting-shuo-guo ta   bu   lai.  
               I NEG hear-say-Exp he NEG come  
               'I didn't heard that he was not coming.'

Elsewhere however, Mandarin *shuo* occurs as a grammaticalized complementizer similar to Taiwanese *kong*, and if it occurs following a verb of cognition, such as *xiang* 'think,' *shuo* may not be accompanied by *-guo*, as seen in (ii) below:

- (ii)       wo xiang-shuo(\*-guo) ta   bu   lai  
               I think-say   -Exp he NEG come  
               'I thought that he was not coming.'

also seems to occur as a complementizer in clause-*final* position, hence *following* its clausal complement, as in (124) and (125) repeated below:

(124) A•hui liau•chun• A•sin si• tai•pak• lang kong•  
Ahui thought Asin is Taipei person KONG  
'A-hui thought that A-sin is from Taipei.'

(125) goa siong• A•-sin m• lai kong•  
I think A-sin NEG come KONG  
'I thought that A-sin is not coming.'

As Taiwanese like other varieties of Chinese elsewhere shows evidence of being head-initial (see here the examples in (105)), and *kong* otherwise does occur as a genuine grammaticalized complementizer in clause-initial pre-IP position (as in (122)), this apparent clause-final V-to-C grammaticalization of *kong* is rather strange and seems to go against the general headedness specification of the language. It clearly also does not correspond to any serial verb position from which *kong* could have naturally grammaticalized as a complementizer.

In order to explain the puzzle of clause/sentence-final *kong*, I will shortly suggest that the canonical position of the grammaticalized complementizer *kong* is indeed *preceding* its IP complement as in (122) and show that there is certain rather clear evidence from tone sandhi patterns indicating that the unexpected exceptional order in (124) and (125) is one which is actually *derived*, via a process of IP-raising to Spec of CP.

### 3.5.1 Tone Sandhi Patterns with *Kong*

Considering the ordering of  $C^0$  and IP found in (122), one finds quite regular expected patterns of tone sandhi. The  $C^0$  grammaticalized verb *kong* undergoes tone sandhi in its position preceding the IP complement, this caused by a regular head-complement relation, and the final element in the embedded IP *lai* does not undergo tone sandhi. This is fully anticipated as sentence-final elements do not undergo tone sandhi (as seen above in (103) and other examples).

Turning to (124) and (125), with the unusual ordering of IP- $C^0$  in the embedded clause, one now finds two quite unanticipated tone sandhi patterns. The first of these is that the IP-final element *lang* in (124) and *lai* in (125) do *not* undergo tone sandhi. If one assumes that the IP is the leftward complement of *kong* in a final  $C^0$  position, this should mean that the IP and the  $C^0$  are in the same tone sandhi domain and it is expected that the head-complement relation should result in tone sandhi occurring between the  $C^0$  and the element left-adjacent to it in this tone sandhi domain, i.e., the final syllable in the IP, yet this doesn't happen.

The second extraordinary tone sandhi patterning in forms such as (124) and (125) is that the *sentence-final* element *kong* does in fact undergo a tone change. This is very much unexpected as no other elements in sentence-final position are known to undergo tone sandhi, the sentence being a self-contained tone sandhi domain as noted earlier when discussing example (103). Furthermore, the grammaticalization of *kong* might be expected to result in it either maintaining its citation tone<sup>2</sup> or simply reverting to a neutral tone/absence of tone as is commonly

found in other cases of grammaticalization (e.g., Mandarin, *de*, *le* and *-zhe*, and various functional elements in Taiwanese). However, instead of this, *kong* undergoes a fully regular tone sandhi change in sentence-final position. Examples such as (124) and (125) need also not be followed by any other sentence for tone sandhi to occur on *kong* and so it would appear that there is nothing following *kong* which could trigger its tonal change.

Both such patterns can now be argued to have a rather simple explanation. Critically, both of the odd patterns observed in (124) and (125) are exactly parallel to those occurring in “regular” examples such as (122) and (126) below where the complementizer *kong* occurs preceding its complement IP:

- (126) A•hui liau•chun• kong• A•sin si• tai•pak• lang  
 Ahui thought KONG Asin is Taipei person  
 ‘A-hui thought that A-sin is from Taipei.’

In (122) and (126), as just noted, the final syllable in the lower IPs, *lai* and *lang* respectively, do not undergo tone sandhi (as expected), and *kong* preceding its IP complement does undergo tone sandhi (again as expected). Comparing (122)/(126) and (124)/(125) it can therefore be seen that precisely the same tone sandhi patterns occur both when *kong* precedes its complement IP in a regular head-initial C<sup>0</sup> position and when *kong* occurs finally in a rather unusual position:

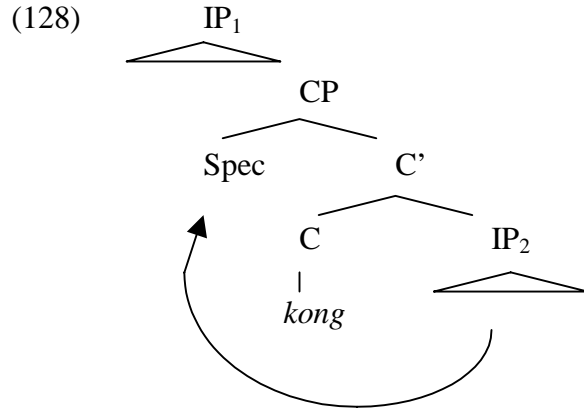
- (127) a. *kong* – IP: expected order, expected tone changes
- (i) final syllable in IP does not undergo tone sandhi
  - (ii) *kong* does undergo tone sandhi
- b. IP – *kong*: unexpected order, unexpected tone changes
- (i) final syllable in IP does not undergo tone sandhi
  - (ii) *kong* does undergo tone sandhi

The simple conclusion from such a comparison is that *kong* in its unusual sentence-final position is behaving for tone sandhi purposes exactly as if it occurred in a regular pre-IP position. Syntactically in order to capture this striking parallelism it can now be suggested that IP-*kong* forms such as (124)/(125) are actually the result of an IP-raising operation applying to underlying fully regular *kong*-IP forms *before* they are converted into IP-*kong* sequences. Such a pair of assumptions allows for a very straightforward explanation of the otherwise unanticipated tone sandhi facts, as follows. Prior to IP raising, the final element *lang/lai* in the embedded IP in (124/125) will occur in sentence-final position and *kong* will occur as a regular C<sup>0</sup> preceding an IP-complement. If the tone sandhi rules are applied at this derivational point, the result will be (a) that the final syllable in the IP *lang/lai* does not undergo any tone sandhi change, being in sentence-final position, and (b) that *kong* does undergo tone sandhi, being in a head-position preceding its IP complement.

Observe how the assumption of IP-raising will explain both the unusual tone sandhi patterns in *kong*-final sentences and the odd sentence-final position occupied by *kong* and further note that *kong* occurs as a regular CP-initial complementizer in embedded clauses such as (122)/(126). It might naturally be assumed that the

hypothesized IP-raising operation applies in the embedded clause in (124)/(125) converting a string such as (122) into (125). Such a derivation is schematically represented in (128):

- (122) goa siong• kong• A•-sin m• lai  
 I think KONG A-sin NEG come  
 ‘I though that A-sin was not coming.’
- (125) goa siong• [CP [IP<sub>2</sub> A•-sin m• lai]<sub>i</sub> kong• t<sub>i</sub> ]



However, there is actually good reason to believe that this is not exactly how IP<sub>2</sub> and *kong* become re-positioned relative to each other. Although *kong* might seem to bear all the hallmarks of an embedded complementizer grammaticalized from a general verb of communication as in many other languages, further data reveals that *kong* in fact syntactically embeds not just a lower clause but *the entire matrix sentence* in which it occurs sentence-finally.

The evidence that this is so comes in two forms. First of all, in sentences such as (124) and (125) it is possible to have not only a *kong* in sentence-final

position, but also a second *kong* in a regular grammaticalized embedded Comp position preceding the embedded IP, as in (129) and (130):

(129) A•hui liau•chun *kong*• A•sin si• tai•pak• lang *kong*•  
 Ahui thought KONG Asin is Taipei person KONG  
 ‘A-hui thought that A-sin is from Taipei.’

(130) goa siong• *kong*• A•-sin m• lai *kong*•  
 I think KONG A-sin NEG come KONG  
 ‘I think that A-sin was not coming.’

This indicates that the sentence-final *kong* does not originate in an embedded  $C^0$  position, as this position can clearly be filled by a second distinct *kong*. Consequently, the natural assumption to make is that sentence-final *kong* is actually in the matrix  $C^0$  in (124), (125), (129) and (130) and that the entire  $IP_1$  (i.e., the whole sentence consisting of both clauses  $IP_1$  and  $IP_2$ ) is raised to the Specifier projected by this matrix  $C^0$ . Clear confirmation that this is true comes from the fact that it is possible to have a sentence-final *kong* in *single-clause* sentences, as in (131)-(133). This indicates that *kong* here can only possibly be occurring in a matrix Comp as there obviously is no embedded  $C^0$  in such clausal structures:

(131) A•sin m• lai kong•  
 A-sin NEG come KONG  
 ‘A-sin’s not coming.’

(132) goa chahng bo• khi• tai•pak• kong•  
 I yesterday NEG go Taipei KONG  
 ‘Yesterday I didn’t go to Taipei.’

(133) goan• lau•pe si• tai•pak• lang kong•  
 I father be Taipei person KONG  
 ‘My father is from Taipei.’

Furthermore, if one compares (125) which has a single sentence-final *kong* with (122) where *kong* occurs preceding the embedded IP, one finds that the interpretation of the two structures is not fully equivalent. Use of *kong* in (122) essentially adds nothing extra to the meaning of the sentence, much in the way that the optional addition of the English complementizer ‘that’ adds no extra semantic content when it precedes an embedded clause. Use of sentence-final *kong* however does add clear extra meaning to the sentences it accompanies, and encodes speaker-related emphatic assertion of the sentence which in English can often be naturally glossed with the expression ‘I’m telling you X!’ (where X = the content of the sentence). This emphatic assertion resulting from the use of S-final *kong* in (134) below implies the interpretation that: “A-sin has written in his letter saying he is coming, so why do you, the person listening to me (the speaker) think that he will not come?”:

(134) A•-sin e• phoe sia• kong• bin•a•chai beh• lai kong•  
 A-sin GEN letter write KONG• tomorrow want come KONG  
 ‘A-sin's letter wrote that he will come tomorrow.’

As a result of the above observations, it can be suggested that *kong* is indeed a grammaticized C<sup>0</sup> element, but one which critically occurs in matrix clause positions. Quite possibly this restriction results from *kong* being licensed by a speaker-centred propositional attitude (the special emphasis of *kong*) which can only be encoded in matrix clauses where the speaker is the clear source of the information.<sup>30</sup> Assuming *kong* then to be in the matrix C<sup>0</sup>, the surface forms found in (125) and (131) can actually be argued to have the underlying derivation and structure indicated in (135) and (136):<sup>31</sup>

---

<sup>30</sup> Note that is similar to the observation that various propositional attitude adverbs in English and other languages cannot occur in embedded contexts:

- (i) John said that (\*/?frankly) Mary was crazy.

Embedding the adverb under a higher clause subject seems to block the speaker's control of the propositional attitude expressed by the adverb, a licensing requirement which appears to be necessary for the use of certain adverbs.

<sup>31</sup> The analysis of IP-raising suggested here would be further supported if it could be shown that extraction of an element from the IP could not licitly occur, as extraction from within a leftward Spec position (as opposed to from within a complement position) might be expected to violate Subjacency. Unfortunately because IP-final *kong* is a root/matrix clause C<sup>0</sup>, such tests cannot be constructed, as there is no higher position in the clause that an element could be legitimately extracted to. Note however that it might be suggested that the unacceptability of *wh* elements in *kong* sentences could be due to Subjacency applying to LF extraction in some way:

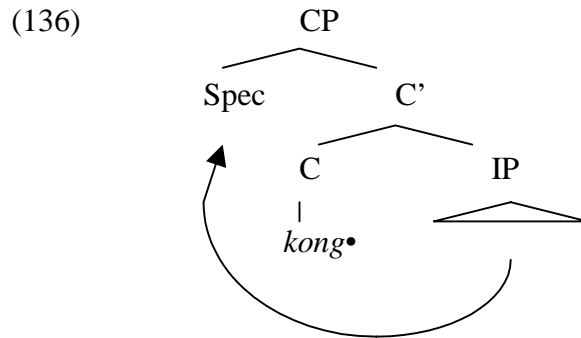
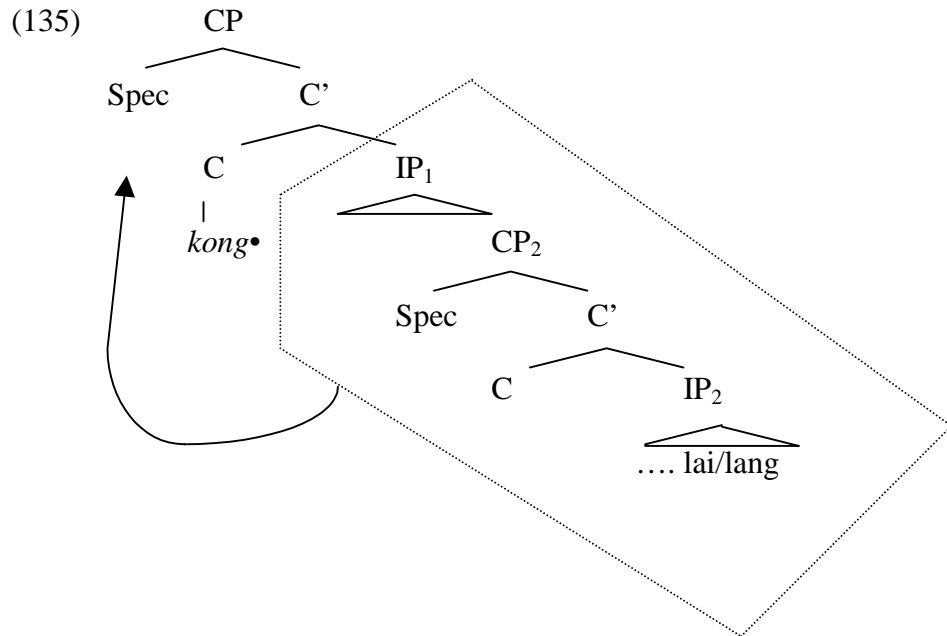
- (i) \*A-sin be sia-mih kong?  
 A-sin buy what KONG  
 'What did A-sin buy?'

I would like to suggest though that the *wh* elements actually cannot co-occur with IP-final *kong* because *kong* instantiates a declarative and hence non-interrogative value of C<sup>0</sup>, *kong* functioning to emphatically assert the IP. If the C<sup>0</sup> is non-interrogative it will simply not be able to license *wh* elements (and the unacceptability of cases such as (i) will therefore not be due to any LF Subjacency violation).

In this regard note furthermore that yes/no question particles can also not co-occur with *kong*:

- (i) \*A-sin u lai bo kong?  
 A-sin AUX come Q KONG  
 'Did A-sin come?'

Such complementary distribution of *kong* and question particles can be taken as indication that *kong* and interrogative X<sup>0</sup> elements occur as alternative competing instantiations of the same basic C<sup>0</sup> head position with *kong* and question particles encoding opposite semantic values--declarative assertion vs. interrogative +Q.



(135) and (136) will then allow for the basic explanation of the tone sandhi patterns already given. Considering (135) which represents the examples considered in (124) and (125), what needed to be accounted for in (124)/(125) were the two significant facts that (a) the final syllable in IP<sub>2</sub> *lang/lai* does not undergo any tone sandhi change, and (b) that sentence-final *kong* does undergo tone sandhi change. If one assumes that (135) is the underlying structure for (124)/(125) and that the tone sandhi rules apply to (135) before the movement of IP<sub>1</sub> (and IP<sub>2</sub>, etc.) to SpecCP<sub>1</sub>, these two patterns are simply explained. The final element *lang/lai* of IP<sub>2</sub> will be in

sentence-final position when tone sandhi changes are applied, and so no tonal change will occur in *lang/lai* as there is no tone-bearing syllable following it at this point. As for *kong* in  $C^0$  of the matrix  $CP_1$ , it will be followed by its complement  $IP_1$  at the point of tone sandhi application and so this will naturally cause tone change on *kong*. The conclusion that *kong* is in the matrix  $C^0$  thus essentially alters nothing in the basic account of the unusual tone sandhi patterns in *kong*-final sentences, and the suggestion that there is IP-raising in such forms is seen to account both for the odd tone sandhi with *kong* and its non-canonical sentence-final position.<sup>32</sup>

### 3.5.2 Grammaticalization of *Kong* and Motivations for IP-movement

I now turn to consider the obvious question of why IP-raising takes place in *kong* sentences, and also examine a little further how *kong* has undergone grammaticalization in structural terms. Importantly, because IP-final *kong* has grammaticalized into the *matrix* clause  $C^0$ , the process of its grammaticalization must actually have been somewhat different from the grammaticalization of other verbs of saying as *embedded* clause complementizers noted in section 3.1.1. In the latter cases, the source of the new sequence of verb and complementizer is a serial verb construction consisting of two verbs, as diagrammed in (31). With IP-final

---

<sup>32</sup> Concerning the question of whether other older S-final particles in Taiwanese also result from IP-raising, when one examines these (e.g. aspectual *-a* (Mandarin *le*)), one finds that they are now phonetically reduced to the extent that they no longer carry any positive tone which could undergo tone sandhi. Such a lack of possible tone sandhi does not indicate that IP-raising does not occur with these particles, and only has for effect that any (hypothetical) raising can no longer be made visible by possible tone sandhi. Essentially then it is necessary to catch a particle at a particular point in its development in order to be fully confident about its underlying syntax, Taiwanese *kong* being especially clear and revealing here in still having both an obviously recognisable source as the

*kong* however, the most likely explanation of its grammaticalization as a *matrix* clause  $C^0$  is that this has occurred when earlier two clause structures containing *kong* as the higher clause predicate have over time been re-analyzed as single clause structures, as outlined in (137). In such a sequence of development, *kong* reanalyzed as a  $C^0$  will come to occur as the  $C^0$  of the single matrix clause which remains after the collapse of bi-clausal forms into new mono-clausal structures:

- (137) Stage1: bi-clause structure, *kong* a real verb meaning ‘to say’ with an NP subject and a clausal complement:

[ NP<sub>subject</sub> *kong* [IP .....]]

Stage 2: the 2-clause structure re-analyzes as a single clause; *kong* deverbalsizes and loses its NP subject, *kong* grammaticalizes as a new matrix clause  $C^0$

[CP [C *kong* [IP .....]]]

Stage 3: the IP complement of *kong* raises to SpecCP (motivation for IP-raising discussed below):

[CP [IP .....]<sub>i</sub> [C *kong* t<sub>i</sub> ]]

Noting also that it is specifically an emphatic assertion of the first-person speaker which is communicated by the use of *kong*, such a first-person restriction can be suggested to have resulted from *kong* in the original two-clause structure having commonly had a first person subject when used as an emphatic assertive form. As part of the grammaticalization process I suggest that the first person subject

---

verb ‘to say’ and the positive tone which allows it to undergo tone sandhi.

specification associated with *kong* emphatic forms may have subsequently become re-analyzed and absorbed directly into the element *kong* as an inherent restriction on its use. Such a process of re-analysis has indeed been attested elsewhere in similar cases with the grammaticalization of quotative complementizers and the creation of evidential morphemes. Harris & Campbell (1995, p.169), for example, note that the Georgian quotative complementizer *metki* can only be used to quote the words of the speaker and point out that *metki* grammaticalized from an original sequence *me vtkvi* which literally meant ‘I said (it).’<sup>33</sup> Similarly, in many American Indian languages evidential suffixes on verbs have grammaticalized from verbs of seeing and hearing following the collapse of two-clause structures into mono-clausal forms in the same way hypothesized for *kong*. Examining Maricopa, Gordon (1986) notes that the addition of the suffixes -‘*yuu* and -‘*a* to verbs results in the interpretation that the speaker respectively saw or heard the action described:

(138) *lima-‘yuu*  
 dance-EV  
 ‘He danced (I know because I saw it).’

(139) *ashvar-‘a*  
 sing-EV  
 ‘He sang (I know because I heard it).’

---

<sup>33</sup> *Me* is the pronoun ‘I’ and *v-tkv-i* is the first person singular subject (*v-*) aorist indicative (*-i*) of the verb ‘say.’ Note that in the case of Taiwanese, as Taiwanese subjects can be phonetically null (i.e. *pro*), there is no necessary phonetically overt reflex/trace of the incorporation of the first person specification into the reanalyzed *kong* (unlike in Georgian).

The restriction that it is the speaker who has the visual or aural evidence for the truth of the proposition simply results from the fact that these suffixes are derived from the first person singular verbal forms of the verbs *yuu-k* ‘to see’ and *av-k* ‘to hear’ (the prefix element [ ‘- ] being a first person singular marker). As the morphemes ‘*yuu* and ‘*a* are synchronically no longer verbs but clause-final particles, it can be assumed that the first person subject specification has become re-analyzed as an inherent property of these  $X^0$  heads, restricting their use and resulting in the interpretation that it is specifically the speaker who has the visual/aural evidence for the proposition. In Taiwanese, IP-*kong* forms are here suggested to have developed from two-clause structures in a similar way, with *kong* as the higher clause verb undergoing deverbilization and incorporating a first-person speaker-related interpretation from its former syntactic subject.<sup>34</sup>

Assuming this much, I can now outline two possible explanations for the IP-raising which has accompanied grammaticalization of *kong* as a  $C^0$  element, one phonological, the other syntactic. The first phonological possibility is that as *kong* has grammaticalized into a particle-like element, like other particles it has become increasingly more clitic-like and dependent and in need of some kind of phonological support.<sup>35</sup> Normally in Chinese such support should critically come from an element to the particle’s *left*, as stress in most varieties of Chinese including

---

<sup>34</sup> Speculating a little on why bi-clausal structure might collapse into simplified mono-clausal forms in this way, it can be suggested that this perhaps takes place when there is no longer any pressure to see the content of the higher clause predicate as instantiating a highlighted discrete event.

<sup>35</sup> See Bybee, Perkins & Pagliuca (1994, p.107) for discussion of the fact that grammaticalization frequently leads to phonetic reduction, causing phonological dependency and cliticization.

Taiwanese is phrase-initial and commonly leads to encliticisation rather than the occurrence of proclitics. One potential explanation of IP-raising with *kong* is therefore to suggest that the tendency for functional clitic-like elements to attach to their left may directly trigger movement of the IP complement of *kong* to a position to its left in order to provide *kong* as an enclitic with phonological support.<sup>36</sup>

A second possible syntactic explanation of the IP re-positioning is to suggest that this movement occurs as the result of the particular informational structure of *kong* sentences. Recall that in section 3.1.2 it was noted that S-final *kong* adds to the proposition expressed in its IP complement an assertive interpretation equivalent to English: ‘I’m telling you IP!’ or ‘Why do/would you doubt IP?’ When S-final *kong* is used, it importantly seems to imply that the hearer may already entertain the proposition expressed in the IP, but perhaps be somewhat doubtful of it for no good reason in the speaker’s opinion. Use of *kong* by the speaker then expresses the speaker’s strong endorsement of the truth of the proposition, in a way similar to the use of ‘I’m telling you!’ in English as in (140):

(140) He’s gone, I’m telling you!

In S-final *kong* sentences then the proposition encoded in the IP is a possibility which may be entertained as true by both speaker and hearer but with different degrees of certainty. In this sense the IP therefore represents old, topic-like information largely presupposed by the participants in the conversation, and the clear

---

<sup>36</sup> See here Grosu (1988) and Giusti (1997) for clear evidence that dependent enclitic definite determiners in Romanian attract elements to D<sup>0</sup>/SpecDP in order to support them phonologically and

focus of attention and force of *kong* sentences lies in the *assertion* of the proposition by the speaker via the explicit use of *kong*. Because of this topic-like property of the IP and the strong focus on the asserting act with *kong*, an alternative to the encliticisation account of IP-raising is therefore to suggest that movement of the IP takes place in order to topicalize the IP, placing the IP in sentence-initial topic position and leaving *kong* in prominent sentence-final position where it is naturally interpreted as being in focus. In such a syntactic analysis the IP-raising in *kong* sentences would essentially be an operation of defocusing, or ‘p-movement’ in Zubizarreta’s (1998) terms, carried out in order that a secondary element (*kong*) is cast into focus in a prominent position (sentence-finally here).

Both of the above two possible explanations of IP-raising in *kong* sentences I believe may in fact be plausible as quite general causes of S-final particle creation in SVO languages. If bi-clausal structures may perhaps more regularly collapse into mono-clausal forms with higher clause predicates grammaticalizing into particles in the way outlined, I suggest that either encliticisation or topic-focus reasons might then in many cases possibly lead to the displacement of IP-like clausal constituents in a leftward direction resulting in the creation of S-final particles. Both phonology and information structure may therefore possibly be genuine forces underlying the frequent occurrence of particles in S-final position in different instances. Considering the particular case of *kong* however, it would seem that an explanation in terms of defocusing is most likely to be the real motivation for the IP-movement,

---

hence that this kind of attraction for phonological support is indeed attested elsewhere.

accounting as it does for the particular topic-focus interpretation of *kong*-final forms, and encliticisation/phonology taken as a potential trigger for the movement would seem to miss this link with the meaning of *kong* sentences. I therefore now assume that in the case of *kong*, IP-raising does indeed take place for defocusing reasons and turn to see how such a conclusion interacts with a consideration of the *derivational timing* of IP-movement.

### 3.5.3 Evidence for PF Movement?

An important part of the IP-raising account of the tone sandhi patterns in *kong*-final sentences has been the suggestion that tone sandhi changes are made at a particular point in the derivation of such sentences when the IP-complement of *kong* in  $C^0$  is still *in situ* and has not yet been raised to SpecCP. Only if the tone sandhi rules are applied at this point can the unusual patterns be given a principled explanation in line with other tone sandhi patterning in Taiwanese.<sup>37</sup> Concerning the essential nature of tone sandhi, given that tone sandhi rules alter the phonetic interpretation of an

---

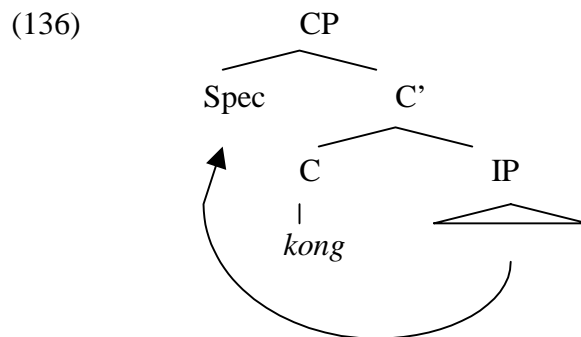
<sup>37</sup> The *kong* paradigm therefore seems to provide a clear argument in favour of a *derivational* model of grammar, and would not seem to be easily accounted for in any fully representational approach. In a non-derivational approach, *kong* sentences would have the (single) representation in (i) with the IP in its surface position relating to a trace/copy following *kong*:

- (i)        [[IP]<sub>i</sub> *kong* t<sub>i</sub> ]

The problem here is that the element following *kong* in (i) is phonetically null and therefore should not be able to trigger tone sandhi in *kong*. Elsewhere it is clearly only phonetically overt elements (which furthermore must have non-neutral tone) that can trigger tone sandhi on a preceding element (hence, for example, an object *pro* does not cause tone sandhi on a verb). Note that it is also not possible to allow for copies of movement (as opposed to base-generated empty categories) to exceptionally cause tone sandhi as the copies left by other types of movement such as object topicalization do not cause tone sandhi on the elements which precede them. There would therefore seem to be no obvious way to account for the tone sandhi patterns with *kong* without assuming a derivational approach where the overt IP triggers tone sandhi on *kong* before raising to its left.

element and so apply to specifically phonetic features, it is most natural to assume that such rules are indeed *phonological rules* and consequently apply in the PF component after Spell-Out. This being so, it can be shown that one seems to be led to the further conclusion that the hypothesized IP-raising operation itself significantly has to occur in the PF component too.

The critical sequence in the derivation of *kong*-final sentences is that underlying forms such as (136) repeated below are created in the syntactic component and then *prior to IP-raising* presented for tone sandhi alternation. Assuming that tone sandhi is a phonological process, under standard assumptions it should only take place after a syntactic sequence has entered the PF component. Now, because the IP-raising operation has to take place *after* the tone sandhi rules have applied, it seems that one therefore should conclude that the IP-raising also occurs in the PF component and hence is importantly an instance of movement in PF rather than syntactic movement.



Under such assumptions, the derivation of a *kong*-final sentence such as (46) can be schematized as in (141):

(141) [CP [C kong [IP A-sin m lai]



**Spell-Out**



**PF--tone sandhi rules apply** (changing the tone on *kong* and maintaining the citation on *lai*)

[CP [C kong• [IP A-sin m• lai]]]



**IP-raising**

[CP [IP A-sin m• lai]<sub>i</sub> [C kong• ] t<sub>i</sub> ]]

At first sight, the tone sandhi patterns of *kong*-final sentences might therefore seem to offer good support for the general possibility that not all movement operations are necessarily syntactic and that certain occurrences of raising potentially take place in the PF component too. However, further reflection reveals that a serious problem is also introduced by the conclusion that IP-raising occurs after the application of tone sandhi and hence apparently in PF. Elsewhere in the past where claims have been made that movement occurs in PF, such suggestions have importantly been made when the visible repositioning of certain constituents appears to have no impact on *interpretation*. In such cases it is suggested that if the relevant movement is assumed to take place only in PF after the derivation has left the syntactic component, its effects will not be present in the structure presented for interpretation at LF, and the fact that the movement is semantically vacuous can be simply explained. Operations of PF movement are therefore clearly expected not to have an impact on the meaning of a sentence and not to be associated with any particular interpretation. Considering

the IP-raising in *kong*-final sentences, such movement does however appear to be associated with a particular interpretation, and structures in which an IP is raised before *kong* are regularly interpreted as topic-focus forms with the IP instantiating old information and *kong* encoding a highlighted assertive focus, similar to other structures generated by operations of defocusing p-movement. Such a connection between IP-movement and the creation of a particular interpretation therefore suggests that IP-raising should be assumed to take place not in PF but actually during the course of the syntactic derivation in order to be present in the input to LF. The patterns with *kong* consequently lead to an apparent contradiction. On the one hand there is evidence that IP-raising follows the application of phonological rules and so should be taken to be PF movement, yet on the other hand there are interpretative effects indicating that the movement should in fact be assumed to occur in the syntax. As there is no obvious way of resolving such a paradox in a traditional T-model of grammar, the patterns with *kong* may therefore seem to suggest that there is actually a rather different interaction between syntax and phonology than assumed such a model, and that a solution to the *kong* dilemma may perhaps lie in (somehow) allowing phonology greater access to mid-derivational syntactic structures. Discarding the possibility of a PF movement analysis of the *kong* patterns, I will now see how the conflicting properties of *kong* sentences can in fact be naturally reconciled with Chomsky's (1998) idea of cyclic Spell-Out and that the *kong* paradigm consequently provides good support for such an approach to the phonology-syntax connection.

### 3.5.4 *An Alternative--Cyclic Spell-Out*

In contrast to earlier GB and Minimalist models, Chomsky (1998) suggests that there is in fact no single point of Spell-Out where the phonetic features of a sentence are fed off to PF and phonology, but that sub-parts of a derivation may be given phonetic interpretation during the course of a single derivation and before a structure is finally completed. A single syntactic derivation is therefore taken to be potentially spelt-out in a number of successive cycles which Chomsky tentatively identifies as CPs and  $\nu$ Ps, the “phase” constituents. Once such a phase constituent has been syntactically created, the suggestion is that it may possibly also be spelt-out phonetically before being merged into a higher syntactic unit.

The tone sandhi patterns investigated here can be argued to provide good evidence in support of such a cyclic Spell-Out approach and also allow for a better understanding of certain aspects of the process of cyclic Spell-Out.<sup>38</sup> The critical patterning in *kong*-final sentences in need of some account is the fact that the IP-movement seems to have to take place *after* the application of a phonological process, the tone sandhi changes. This led us above to the initial hypothesis that IP-raising perhaps takes place at PF, but such a possibility was then rejected on the grounds that the movement seems to be associated with interpretative effects. If a model incorporating cyclic Spell-Out is however adopted and it is assumed that sub-parts of syntactic structure may be given phonetic interpretation mid-way in the

---

<sup>38</sup> Thanks go to both Joseph Aoun and David Pesetsky for pointing out how the tone sandhi patterns might be considered evidence for cyclic Spell-Out.

course of a derivation, a rather simple second explanation for the sequencing of tone sandhi and IP-raising automatically becomes available which does not require the assumption of movement at PF. Significantly the element *kong* is taken to occur grammaticalized in  $C^0$  and hence instantiates the head of a phase-type constituent, CP. It can therefore be suggested that after construction of the phase CP with *kong* in  $C^0$  merged with its complement IP to the right (i.e. [<sub>CP</sub> kong [<sub>IP</sub> ...]]), this sequence is given phonetic interpretation and spelt-out in PF. Entering PF the tone sandhi rules will apply to the sequence and cause a tone sandhi alteration in *kong* but not in the final element in the IP, resulting in the surface attested tone sandhi patterns. Following this, the syntactic derivation will then continue, with the IP undergoing raising to a Specifier position to the left of *kong*. On completion of the full syntactic derivation, the sequence will then be spelt-out and will surface with the linear sequence [[<sub>IP</sub>...] kong]. In such a cyclic Spell-Out approach the IP-raising therefore occurs as a fully regular *syntactic* movement, and movement at PF importantly need not be assumed. The apparent paradox that IP-movement must take place in the syntactic component yet after the application of certain phonological rules can consequently be captured rather simply with the idea of cyclic Spell-Out, and to the extent that *only* such an approach seems able to capture the patterning found with *kong*, the *kong* paradigm then clearly offers good support for such a view of syntax and phonology.

The Taiwanese tone sandhi patterns also allow for certain further conclusions about the actual process of cyclic Spell-Out and a finer understanding of the nature

of phase constituents. A first point concerns the input forms to cyclic Spell-Out. Quite generally, Chomsky (1998) suggests that there is a distinction between Specifiers that are semantically selected by a head and “extra” Specifiers which it is argued are licensed with the categories C, T and  $\nu$  in addition to any selected external argument (EA). Non-selected Specifiers of this second type are taken to host the subject (SpecTP), raised *wh*-phrases (SpecCP), and shifted objects (Spec $\nu$ P). Projections of the “core functional categories” C, T and  $\nu$  are accordingly schematized as in (142), with H being the head, YP its complement, EA a semantically selected Specifier, and XP the extra non-selected Specifier:

(142) [ XP [ (EA) H YP]]

The outer Specifier XP is furthermore suggested to be a position which is critically visible to syntactic heads which occur higher than a CP or  $\nu$ P phase, allowing for an element in XP to raise to satisfy EPP requirements of a higher head. Elements inside the inner pair of square brackets in (142) are taken to be largely invisible to higher positions due to the opacity of phases (“phase impenetrability”). The outer Specifier is therefore a position which is in a sense importantly not inside the phase proper and not part of the phase’s core. Turning back to Taiwanese and *kong*-sentences now, it has been suggested that the IP complement of *kong* raises to a Specifier associated with *kong* after the sequence *kong*-IP has been spelt-out. Such a Specifier (SpecCP) is not semantically selected and is therefore of the extra “outer” type just described (XP in (142)). It can therefore now be argued that the input to cyclic Spell-Out may

quite possibly be the inner core of phases consisting of the head of a phase, its complement YP and any external argument Specifier (EA), but not necessarily a phase's outer phase-peripheral Specifier XP. Such a Spec position is perhaps created only after the inner core of a phase has been sent to Spell-Out. In *kong* sentences then, the inner core of the phase headed by  $C^0$  (*kong*) is constructed resulting in the linear sequence [kong IP/TP] and then this is spelt-out phonologically, critically also undergoing tone sandhi alteration at this point. Following Spell-Out of the inner core of the phase, an outer Specifier position is created and the IP (TP) complement of *kong* is moved to this position. Finally the full and final syntactic structure is presented to the phonological component again and the linear order [IP/TP kong] is pronounced.<sup>39</sup> This sequencing is now diagrammed in (143) below (using example (46) again):

---

<sup>39</sup> It can be assumed that such an end-of-derivation re-presentation of the completed syntactic form to the phonology will not result in any second application of tone sandhi rules and that tone sandhi alterations occur only once to any phase.

(143) **Syntactic creation of the inner core of phase headed by C<sup>0</sup> kong:**



[ kong [IP/TP A-sin m lai ] ]



**Spell-Out of the inner core + application of tone sandhi rules:**



[ kong• [IP/TP A-sin m• lai ] ]



**Syntactic raising of the output of mid-derivational Spell-Out →  
IP/TP raising to outer phase-peripheral Spec of the phase CP:**



[CP [IP/TP A-sin m• lai ]<sub>i</sub> kong• t<sub>i</sub> ]



**Final syntactic form is pronounced (as above)**

Such conclusions about the input forms to cyclic Spell-Out are further strengthened and confirmed by an independent pattern found in English, the interaction of *wh*-movement and sentential stress discussed in Bresnan (1971), which largely anticipates the idea of cyclic Spell-Out. Bresnan convincingly shows that *wh*-phrases which appear raised in surface forms in fact behave as if they were *in situ* for purposes of sentential stress assignment. Bresnan notes that whereas sentential stress is normally placed on the final element in a sentence, in *wh*-questions and relative clauses it is placed on a raised *wh*-phrase, as in (144), with ‘what books’ receiving the sentential (non-contrastive) stress:

(144) John asked what BOOKS Helen had written.

Bresnan argues that in order to explain the stress on the *wh*-phrase and the lack of stress on the sentence-final verb, sentential stress must be assigned when the *wh*-element is *in situ* in sentence-final object position prior to raising to SpecCP. As sentential stress is a phonological rule and this must apply before syntactic raising of the *wh*-phrase to SpecCP, Bresnan concludes that phonological rules apply to each transformational cycle in syntax before further syntactic operations occur in higher cycles, and that phonology will therefore be interwoven with syntax in a single derivation (i.e. there is cyclic phonological Spell-Out). Here I can point out two significant points relating to the *wh* data Bresnan presents. First of all, if sentential stress as a phonological rule is naturally applied to a CP constituent, then importantly it applies to the CP *before* the SpecCP position is created by raising of the *wh*-phrase (i.e. sentential stress applies to the object *wh*-phrase in its *in situ* position before any raising). This therefore seems to result in the same conclusion arrived at on the basis of Taiwanese IP-raising that the mid-derivational input to Spell-Out and phonology is indeed the inner core of a CP phase without its external outer Specifier position.<sup>40</sup>

A second important point results from a comparison of Bresnan's patterns with object topicalization in Taiwanese, a construction whose tone sandhi patterns independently require some re-consideration here. As mentioned in footnote 37, and seen in example (109) repeated here below, tone sandhi is not triggered in the verb which precedes the object in the underlying form of an object topicalization sentence (i.e. *kong* in (109)):

---

<sup>40</sup> As with Taiwanese IP-raising, there are also clear interpretational effects associated with

- (109) [tai•oan•oe]<sub>i</sub> [goan• lau•pe] be• hiao• kong t<sub>i</sub>  
 Taiwanese I old-father not know speak.  
 'Taiwanese, my father can't speak.'

If it is assumed that objects are necessarily topicalized to the same SpecCP position that IP-raising targets in *kong*-final sentences, this lack of tone sandhi in the verb would be rather surprising. One would expect that the object would first trigger tone sandhi on the preceding verb during cyclic Spell-Out of the CP phase and then undergo raising to the phase's outer Spec. Because tone sandhi does not however occur in the sentence-final verb it can be suggested that this may then indicate that object topicalization actually does *not* target SpecCP but some other lower adjoined/Focus-phrase position located in the inner core of the CP phase, and that this will explain the lack of tone sandhi in the verb. Any topicalization/focus-raising to a position lower than C<sup>0</sup>/SpecCP will critically take place *before* the CP phase is spelt-out and objects raised and phonetically interpreted in such a higher position will consequently not be able to cause tone sandhi in the lower selecting verb. Good empirical support can also importantly be given for such an explanation of the lack of verbal tone sandhi with object topicalization. If it is assumed that IP-*initial kong* is grammaticalized as an embedding C<sup>0</sup> in subordinate clauses as argued in section 3.1.1, this allows one to test whether object topicalization occurs to a SpecCP position preceding *kong* in C<sup>0</sup> or to an adjoined/Focus position following C<sup>0</sup>. As seen in the contrast in (145) and (146) below, object topicalization can legitimately

---

English *wh*-movement indicating that it clearly cannot be analyzed as PF movement and that a cyclic

occur only to a position below *kong* in  $C^0$  and consequently inside the CP's inner core:

- (145) A•-sin siong• **kong•** [hit• pun• chheh]; A•-hui m• be t<sub>i</sub>  
 A-sin thinks C that CL book A-sin NEG buy  
 'A-sin thinks that A-hui doesn't want to buy that book.'
- (146) \*A•-sin siong• [hit• pun• chheh]; **kong•** A•-hui m• be t<sub>i</sub>  
 A-sin thinks that CL book C A-hui NEG buy

The lack of parallelism between IP-raising and object topicalization with regard to tone sandhi change on the sentence-final element therefore has a reasonable and simple explanation. It also has an interesting consequence when explored a little further in comparison with English *wh*-movement and sentential stress patterns.

Note that Bresnan's *wh*-sentential stress patterns could in fact be given a slightly different explanation from the one offered immediately above. Supposing that the input to cyclic Spell-Out could possibly be phases of either CP or  $\nu$ P type, it could be suggested that sentential stress is actually assigned to an object *wh*-phrase when  $\nu$ P rather than CP is inputted to cyclic Spell-Out, the object *wh*-phrase occurring unraised in  $\nu$ P-final position at such a point and hence in the necessary position to be assigned the relevant stress.<sup>41</sup> The patterns found with Taiwanese object topicalization now importantly seem to exclude this as a possibility and suggest the conclusion that *only* CP phases can occur as the input to cyclic Spell-Out.

---

Spell-Out approach is therefore necessary instead.

The reason for this is that if  $\nu$ P phases could occur as the input to cyclic Spell-Out, one would expect (incorrectly) that Taiwanese topicalized objects would indeed be able to trigger tone sandhi on their selecting verbs, as at the hypothetical point of  $\nu$ P cyclic Spell-Out, such objects would occur *in situ* following the verb in VP.<sup>42</sup> The fact that tone sandhi does not however occur in the verb in such cases therefore clearly suggests the broad conclusion that phonology has access to mid-derivational syntactic forms only at the clausal level after CPs have been constructed, and does not apply directly to smaller syntactic cycles such as  $\nu$ P phases.<sup>43</sup>

The Taiwanese *kong* paradigm thus generally both adds interesting positive empirical support for the idea of cyclic Spell-Out itself and also allows one to understand more precisely what may be involved in such a process, indicating that

---

<sup>41</sup> Note that Chomsky (1998) suggests that prior to *wh*-movement to SpecCP, *wh*-phrases may have to raise to Spec $\nu$ P. However, if such an outer Spec is not created until after the  $\nu$ P phase has been interpreted by cyclic Spell-Out as argued above with CP, then a *wh*-object will indeed still be *in situ* at the point that cyclic Spell-Out may hypothetically apply to a  $\nu$ P.

<sup>42</sup> Again, as noted in footnote 19, raising of an object to Spec $\nu$ P and higher positions should only come after the  $\nu$ P is spelt-out.

<sup>43</sup> Such conclusions also have a further potential consequence for the hypothesis in Chomsky (1998) that *wh*-movement to SpecCP occurs cyclically via Spec $\nu$ P. The latter assumption seems to lead one to expect that when the inner core of a CP phase is phonetically interpreted by cyclic Spell-Out, an object *wh*-phrase will occur raised and phonetically spelt-out in Spec $\nu$ P, as schematized in (i):

- (i) [CP [TP Subject [ $\nu$ P Object<sub>WH</sub> [VP V ]]]]

This however raises a problem for the assignment of sentential stress to the object, as the object is no longer CP-final and in the appropriate position to receive sentential stress. In order to maintain the claim that *wh*-movement does proceed via Spec $\nu$ P, it will have to be assumed that this movement occurs after Spell-Out of the inner core of the CP and that a *wh*-object will actually be fully *in situ* when sentential stress applies to the CP phase as in (ii):

- (ii) [CP [TP Subject [ $\nu$ P [VP V Object<sub>WH</sub> ]]]]

the input to cyclic Spell-Out is a clausal CP constituent prior to the creation of its external Specifier position.<sup>44</sup>

### 3.6 Concluding Remarks

This chapter set out to provide an account of the basic architectural properties of relative clauses in Chinese and focused primarily on how the noun-head, the ‘linking’ element *de* and the relative clause syntactically combine together. Rejecting analyses in which the relative clause is taken to be an exceptional leftward complement to *de* for the reason that the directionality of selection should (ideally)

---

<sup>44</sup> If one assumes a more articulated structure in the left periphery/C-domain, perhaps as in Rizzi (1997), it might be possible to suggest that IP-raising in Taiwanese takes place to a Specifier position which is higher than the Specifier of the projection headed by *kong*. If this were to be so, one needs to ask to what extent the conclusions reached here might possibly be different. I believe that that the main conclusions would essentially not be much changed, and largely just be re-presented with a somewhat different labelling. The basic thrust of the argumentation has been to suggest that the input to cyclic Spell-Out is a clausal constituent which is actually (just) less than a full CP—a CP lacking an outer Specifier in the terms used here. If one now concludes that *kong* is perhaps the head of a Mood/QP which encodes the assertive-declarative/interrogative force of the clause (*kong* occurring in complementary distribution with other Q-morphemes and not allowing for the licensing of *wh*-elements, see footnote 37, and if its IP complement perhaps raises to a higher TopP/CP, then the generalisation in essence remains as before but just makes use of different terms: the input to cyclic Spell-Out is a clausal constituent which is somewhat less than a full clause, being a Mood/QP and not a full TopP/CP.

I believe however that there is actually a good reason for wishing to maintain the original generalisation in the text. What needs to be captured is the observations in (i) and (ii) below:

- (i) The XP input to cyclic Spell-Out in Taiwanese is optionally headed by an  $X^0$  (*kong*) which encodes declarative force in alternation with interrogative Q-morphemes (and hence occurs in  $C^0/Q^0/Mood^0$ ).
- (ii) The XP input to cyclic Spell-Out in English *cannot* be the *full* XP headed by the  $X^0$  ( $C^0/Q^0/Mood^0$ ) which encodes interrogative force, as this input is formed and spelt-out before *wh*-phrases undergo raising to Spec of the XP.

If it is reasonable to assume that cross-linguistically there is a uniform input to cyclic Spell-Out, the two generalisations above indicate that this input form must be (at least) an XP headed by a declarative/interrogative head (due to the Taiwanese evidence with *kong*), but that it cannot be a full XP of this type (due to Bresnan’s English *wh* patterns). An obvious way of capturing these two generalisations is therefore to maintain the suggestions in the text that the input to cyclic Spell-Out is indeed a CP (or perhaps a Mood/QP) which has not yet projected its external Specifier position.

not be subject to different parameter settings within a single language, a variety of evidence was presented in favor of adopting an analysis of relativization in Chinese along lines outlined in Kayne (1994), Vergnaud (1985) and Simpson (1997). It was suggested that the apparent exceptionality of relative clauses in Chinese (i.e., the fact that they are prenominal when no other V-O languages seem to have prenominal relative clauses) should be related to exceptional properties of the lexical item *de* and that following Simpson (1997) in essence, *de* should be analyzed as an enclitic determiner triggering leftward IP-raising for phonological support. I then went on to show how such an approach is preferable to base-generated accounts of superficially similar relative clause structures in Japanese and pointed out a variety of differences in the patterning of relative clauses in the two language types which suggest that a fully unitary analysis is not in fact appropriate. Finally I presented a set of evidence relating to tone sandhi phenomena in Taiwanese which added further empirical support to the IP-raising view of relativization. I also developed the idea that such IP-clausal movement may be further widespread in Chinese and in the case of *kong-final* sentences provide support for Chomsky's (1998) idea of Cyclic Spell-Out.

<b>3. Relative Clause <i>De</i>: Directionality, Clausal Raising and Sentence-final Particles.....</b>	<b>87</b>
<b>3.0 Introduction.....</b>	<b>87</b>
<b>3.1 Relative Clauses in Government and Binding Theory .....</b>	<b>88</b>
3.1.1 <i>Chiu (1993/1995) and <u>SuoP</u>; Ning (1993).....</i>	91
3.1.2 <i><u>DE</u> as a Complementizer .....</i>	96
<b>3.2 Directionality and C-selection--a Theoretical Problem for Standard Analyses .....</b>	<b>98</b>
<b>3.3 Kayne (1994) and a Uniform Theory of Relativization .....</b>	<b>106</b>
3.3.1 <i>Determiners, Demonstratives and Definiteness Agreement .....</i>	111
3.3.2 <i>Further Evidence for the NP-raising Analysis: (1) Language Acquisition: Chiu (1998); (2) Connectivity and Idiom-chunks.....</i>	119
3.3.3 <i>Relativization in Japanese, Murasugi (1991/1998).....</i>	124
3.3.4 <i>Process Nominals and the Structure of Noun-Complement Clause CNPs .....</i>	134
3.3.5 <i>Other Noun-Complement Clause CNPs .....</i>	138
<b>3.4 Taiwanese Tone Sandhi and the Clausal Raising Hypothesis.....</b>	<b>145</b>
3.4.1 <i>Tone Sandhi Patterns in Taiwanese .....</i>	145
3.4.2 <i>Tone Sandhi in Taiwanese Relative Clauses .....</i>	151
<b>3.5 Extensions: Grammaticalized Complementizers in Taiwanese.....</b>	<b>158</b>
3.5.1 <i>Tone Sandhi Patterns with <u>Kong</u>.....</i>	164
3.5.2 <i>Grammaticalization of <u>Kong</u> and Motivations for IP-movement .....</i>	172
3.5.3 <i>Evidence for PF Movement? .....</i>	178
3.5.4 <i>An Alternative--Cyclic Spell-Out.....</i>	182
<b>3.6 Concluding Remarks .....</b>	<b>191</b>