Chapter 5: Movement Structures and Bounding Theory

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Although an important reason for our investigation of overt movement in Syntax is that it paves the way for our investigation of LF movement, a study of the overt movement structures is also fully motivated in its own right. Such structures have always occupied a central role in generative grammar ever since its inception, and study of their properties in the past has led to the discovery of important abstract principles of UG and their associated parameters. For example, since Ross' (1967) discussion of 'island constraints', the study of conditions on movement has never ceased to be a central topic in syntax. Furthermore, with the introduction of the trace theory, the postulation of the existence of empty categories of various kinds has aroused an equal amount of interest in the field. Investigation of such empty categories has not only produced substantial improvement in recent linguistic theory, but continues to offer promise for insights of a most interesting kind concerning the nature of the human language faculty. Chomsky (1981a: 55) writes:

The question of the nature of empty categories is a particularly interesting one for a number of reasons. In the first place, the study of such elements, along with the related investigation of anaphors and pronouns, has proven to be an excellent probe for determining properties of syntactic and semantic representations and the rules that form them. But apart from this, there is an intrinsic fascination in the study of properties of empty elements. These properties can hardly be determined inductively from observed overt phenomena, and therefore presumably reflect inner resources of the mind. If our goal is to discover the nature of human language faculty, abstracting from the effects of experience, then these elements offer particularly valuable insights.

In Section 5.1 I will briefly present a number of structure types involving movement and discuss the various bounding conditions that have been proposed on them, in particular
the island constraints of Ross (1967) and the Subjacency Condition of Chomsky (1973) and later work. Section 5.2 sets out to examine the properties of Chinese topicalized and relativized structures as they relate to the bounding conditions. It is found that while certain topicalized or relativized structures exhibit bounding effects in Chinese as they do in English, others do not exhibit such effects, unlike their English counterparts. In section 5.3, I propose a modular approach to Chinese topicalization and relativization, and argue that the lack of bounding effects in certain constructions arises from the possibility in Chinese, but not in English, of generating a pro in the capacity of an empty resumptive pronoun in such constructions. The implications of this analysis are discussed in section 5.4. Finally, in section 5.5, I turn to some differences between topicalization and relativization and sketch an account of the differences.

5.1. Chains and Bounding

5.1.1. Move α and Traces

A central assumption of current generative grammatical theory is that certain surface sentences are related to others by a relation of movement or 'chains'. In the current EST framework, D-Structure directly represents the thematic properties of lexical items. The d-structure of a sentence includes, in addition to a subject position, a given argument position if and only if that position is required as a lexical property of a given verb. Thus the d-structure of a sentence containing a two-place predicate like kick has an object position, but the d-structure of one that includes a one-place predicate like cry does not. In Chomsky (1981a), this state of affairs is guaranteed by a set of principles governing the assignment of θ-roles and the θ-Criterion, which requires that each argument bears one and only one θ-role and each θ-role is assigned to one and only one argument. Grammatical sentences which do not appear to have arguments in expected arguments positions where they should are admitted, however, as they are represented
with empty categories (traces) in those positions at S-Structure. Representations at S-Structure are related to those at D-Structure by movement. Thus the (b) sentences below are derived from their (a) counterparts by processes classically known as raising, passive, wh-movement and relativization:

(1) a. [e] seems [John to have left].
   b. John\(_i\) seems [t\(_i\) to have left].

(2) a. [e] was seen Bill.
   b. Bill\(_i\) was seen t\(_i\).

(3) a. John saw who.
   b. Who\(_i\) did John see t\(_i\)?

(4) a. This is the book [I like which most].
   b. This is the book [which\(_i\) I like t\(_i\) most].

Given the 0-Criterion, the landing site of each movement process must be a position to which no 0 role is assigned (a non-0 position). Such non-0 positions may be A-positions (positions which bear grammatical functions like subject, object, etc.), as in the case of raising or passive; or they may be A' (A-bar) positions (the position of COMP and those created at the periphery of clauses by adjunction), as in the case of wh-movement and relativization. The relation of the moved category and its trace can be seen as also a relation of binding. Movement to A-positions results in a configuration of anaphor binding, where the trace is seen as an empty anaphor (on a par with anaphors like reflexives and reciprocals) bound by its antecedent in A-position. A'-movement results in a configuration of operator binding, where the trace is seen as a variable and the A'-binder as an operator binding the variable. The movement relations may also be represented by 'chains': In (1)-(2) above, (John, t) and (Bill, t) are A-chains; in (3)-(4), (who, t) and (which, t) are A'-chains.

Although the movement processes illustrated in (1)-(4) have traditionally been regarded as representing distinct movement rules, much research has shown that such
movement rules really do not have distinct properties. The traditional rules of passive, raising, etc. were each formulated in such a way as to contain specific conditions that actually obtain for other rules as well. For example, Ross (1967) noted that the island conditions he proposed applied to all transformations, and therefore that they should be stated in a separate module of grammar, called the "Conditions Box", and not specified for each rule. Similar considerations and further modularization of independent principles led to the proposal that all movement rules should be reduced to two general rules, Move NP (subsuming all A-movement rules) and Move WH (subsuming all A'-movement rules). In fact, the current standard view of UG is that these two rules should be reduced to the single rule Move $\alpha$. This is the view that has been adopted in this work. Although I will occasionally refer to traditional rule labels, such labels are used only for descriptive purposes, but do not have independent theoretical status.

Note that the empty category (EC) in a movement chain must be distinguished from an EC found in structures of control:

(5) John$_t$ tried [e$_i$ to win].

(6) Zhangsan$_t$ shuo [e$_i$ mingtian hui lai].

Zhangsan say tomorrow will come
Zhangsan said that [he] will come tomorrow.

In the current framework, the ECs in (5)-(6) are defined as pronominal ECs (PRO or pro), to be distinguished from traces, which are non-pronominals. Movement chains must be distinguished from 'control chains' for the following reasons. First, whereas members of a movement chain must be related to one and the same $\theta$-role, members of a control chain may typically be assigned separate $\theta$-roles. This can be seen by comparing (John, t) in (1) and (John, e) in (5). Secondly, the relation among members of a movement chain is subject to conditions of bounding as we shall see immediately below, but not the relation among members of a control pair. Thirdly, distribution of the empty category in a movement chain is subject to the Empty Category Principle (ECP), as we shall see in
Chapter 6, but not the distribution of the empty category under control.

Both the pronominal and the non-pronominal ECs can be further divided. In fact, Chomsky (1982) proposes that both lexical and empty categories can in principle be of four kinds, each defined in terms of the feature matrix $[\alpha_\text{anaphor}, \beta_\text{pronominal}]$:

<table>
<thead>
<tr>
<th>Features</th>
<th>Lexical Category</th>
<th>Empty Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>$+\alpha_\text{anaphor}$</td>
<td>reflexives &amp; reciprocals</td>
<td>NP-traces</td>
</tr>
<tr>
<td>$-\beta_\text{pronominal}$</td>
<td>lexical pronouns</td>
<td>pro</td>
</tr>
<tr>
<td>$-\alpha_\text{anaphor}$</td>
<td>----</td>
<td>PRO</td>
</tr>
<tr>
<td>$+\beta_\text{pronominal}$</td>
<td>Names &amp; other lexical NPs</td>
<td>Wh-traces and variables</td>
</tr>
</tbody>
</table>

Chomsky also observes that the various ECs seem to occur in complementary distribution and together partition the distribution of an overt NP. Furthermore, the identity of an EC can in general be predicted on the basis of its position of occurrence or that of its antecedent. Therefore, it is plausible to assume that the different ECs are in fact 'allo-cATEGORIES' of a single EC (analogous to the allomorphs of a single morpheme) whose identity can be determined locally on the basis of the following 'functional definition':

(8)  

a. An $[\text{NP } e]$ is pronominal (=PRO or pro) if and only it is free or locally $\theta$-bound (i.e., bound by an element with an independent thematic role), and non-pronominal (=trace) if and only if it is locally non-$\theta$-bound.

b. A pronominal EC is PRO if and only if it is ungoverned, and pro only if it is governed.\(^2\)

c. A non-pronominal EC is an anaphor (NP-trace) if and only if it is locally A-bound, and a variable (wh-trace) if and only if it is locally A'-bound.
5.1.2. Island Constraints

Although movement may in general take place over an unbounded domain (as illustrated in (9)), there are also well known constraints that prohibit the extraction of elements out of certain domains. One such constraint is the Complex NP Constraint (CNPC) of Ross (1967), which prohibits the extraction of an element out of a relative clause, an appositive clause, or a NP complement (as illustrated in (10):

\[(9*)\]
- a. Who did you believe that John saw t?
- b. Who did you say that John thought that Bill saw t?

\[(10)\]
- a. *Who did you speak to the man who saw t?*
- b. *Who did you report the fact that John saw t?*
- c. *Who did you believe the claim that John saw t?*

Another constraint well known in the literature is the Wh-Island Condition (WIC), which prohibits the extraction of an element out of an S' whose COMP contains a wh-phrase, i.e., an indirect question. Thus, in contrast to (11), (11) is ill-formed:

\[(11)\]
- a. Which book did you think that John bought t?
- b. *Which book did you wonder who bought t?*

To account for the fact that movement may not extract an element out of a sentential subject, Ross proposed Sentential Subject Constraint (SSC):

\[(12)\]
- a. Which book did you predict [that John bought t]?
- b. *Which book was [that John bought t] predicted by you?*

Chomsky (1973) showed that the SSC can be subsumed under the more general Subject Condition (SC), given the grammatical contrast between the nearly synonymous pair below:

\[(13)\]
- a. Who do you like [pictures of t]?
- b. *Who do [pictures of t] please you?
Ross also observed that extraction of an element on the left branch of an NP produces ungrammatical results, a restriction he dubbed the Left Branch Condition (LBC):

(14) a. Who did you see [pictures of t]?
    b. *Whose did you see [t pictures]?

In addition to these constraints, note also that extraction of an element out of an adverbial clause produces ill-formed results: (See also Cattell (1976)???)

(15) a. John got jealous because I talked to Mary.
    b. *Who did John get jealous because I talked to t?

(16) a. The boy stopped crying after the father found the toy.
    b. *What did the boy stop crying after the father found t?

(17) a. John went home, before I had a chance to talk to Bill.
    b. *Who did John go home, before I had a chance to talk to t?

(18) a. John arrived yesterday, sad about the news.
    b. *What did John arrive yesterday, sad about t?

For many speakers, extraction out of a temporal PP gives less satisfactory results than extraction out of subcategorized PPs:

(19) a. Which table did he put the books [on t]?
    b. ??Which class did he fall asleep [during t]?

PPs that are complements to nouns also behave differently from those that are modifiers:

(20) a. Who did you buy [the pictures of t]?
    b. *Which table did you buy [the pictures on t]?

(20a) can be a question about whether you bought the pictures of John or those of Bill, but (20b) cannot be a question about whether you bought the pictures on this table or the pictures on that table. Similarly, corresponding to (21a) we can have (21b) as a question, but corresponding to (22a), we cannot have (22b):

(21) a. I witnessed [the destruction of Rome].
    b. Which city did you witness [the destruction of t]?
(22)  
  a.  I met [the men from Paris].  
  b.  *Which city did you meet [the men from t]?  

The sentences we have seen in (15)-(22) indicate a generalization: The ungrammatical sentences are those in which extraction has taken place out of an adjunct (a non-subcategorized adverbial clause or adnominal modifier). Extraction out of a complement constituent gives entirely satisfactory results. In addition to the various constraints reviewed so far, let us then stipulate that no rule may move an element out of an adjunct constituent, and refer to this as the Adjunct Condition (AC).³  

5.1.3. Subjacency  

We have thus seen that Move $\alpha$ is subject to an array of constraints including the CNPC, the WIC, the SC (including the SSC), the AC and the LBC. Although these constraints go a long way towards restricting the power of grammar and explaining a complex range of empirical data, it also raises a question about their existence and clustering. In particular, why does UG contain this range of conditions, but not, say, a Right Branch Condition, or some other imaginable combination of conditions? One possible answer to this question is to show that these conditions have something in common, to the exclusion of other imaginable conditions. If this is the case, then it is possible that these conditions are simply special cases of a more general condition, and may be derived as theorems of the latter. In this case, the question of their clustering does not arise.  

The theory of Subjacency proposed in Chomsky (1973) and adopted in much current work partially achieves the goal of explaining the constraints. Contrary to Ross' view that, except for cases involving islands, movement is otherwise unbounded, Chomsky argues that movement is in fact subject to a strict locality condition and that apparent cases of unbounded movement are actually derived from successive steps of local movement. In its original proposed form, Subjacency provides that in the
configuration in (23) below, no rule may move an element from the position Y to either position of X or conversely:

\[(23) \quad \ldots X \ldots [\alpha \ldots [\beta \ldots Y \ldots] \ldots] \ldots X \ldots\]

where \(\alpha, \beta\) are bounding nodes.

The bounding nodes defined in the configuration (22) are taken to be the two cyclic nodes NP and S in English and, according to certain formulations, the choice of a bounding node may be a parameter fixed on a language-specific basis.\(^4\) As given in (23), the Subjacency condition has the effect of tying together some of the constraints reviewed above, thus explaining their clustering. The CNPC and the WIC are the immediate consequences of Subjacency. Consider the examples that violate the CNPC and the WIC:

\[(24) \quad *[S' \text{Who} [S \text{do you like [NP the books [S' that [S criticize t_i]]]]]? \]

\[(25) \quad *[S' \text{What} [S \text{do you wonder [S' who [S t_j bought t_i]]]]]? \]

In (24), the wh-phrase who is moved from within a complex NP to the matrix COMP position, crossing two S nodes and one NP node, in violation of Subjacency. In (25), the movement of what from the embedded object position crosses two S nodes. Thus, any violation of the WIC will also be ruled out by Subjacency.

Under this approach, a problem arises with grammatical sentences like (26) (=9)) with apparent unbounded movement:

\[(26) \quad \begin{align*}
&\text{a.} \quad \text{Who did you believe that John saw t?} \\
&\text{b.} \quad \text{Who did you say that John thought that Bill saw t?}
\end{align*} \]

Chomsky argues, however, that such sentences are derived by the successive-cyclic movement of a wh-phrase through intermediate COMP nodes. Thus the S-Structure representation of (26a) is (27):

\[(27) \quad [S' \text{Who}_i [S \text{did you believe [S' t_j that [S John saw t_i]]]]]? \]

In particular, Chomsky assumes that there are two positions in COMP, one reserved for [+wh] elements and the other for [-wh] elements.\(^5\) In the d-structure of (26a), the [+wh]
position of the intermediate COMP is unfilled, so movement of who may proceed through it to the matrix COMP position. At each step, movement crosses only one bounding node, S, fully obeying Subjacency. On the other hand, successive-cyclic movement is not an available option in the case of WIC violations, since the [+wh] position of the intermediate COMP is already filled. Furthermore, given that only S', but not NP, has a COMP node, a CNPC violation also cannot be avoided under successive-cyclic movement. In (24), even if who had been moved into the COMP of the embedded S' first, the next step of movement into the matrix COMP has to cross two bounding nodes, NP and S.

Certain Subject Condition effects may also fall out under Subjacency. In (28) (=13b), movement of who has crossed NP and S:

(28) *[S' Whoi [S do [NP pictures of ti] please you?]]

It has been thought also that Ross' SSC also falls out under Subjacency:

(29) *[S' Whoi [S did [S' that [S that she married ti]] surprise you]]?

However, given that the COMP of the sentential subject is filled only by that, an empty [+wh] position is still available, and successive-cyclic movement should have been possible. One might suggest that sentential subjects are dominated by NP in addition to S', but this raises the further question why sentential complements (as in (26)) are not also dominated by NP. Furthermore, given the S/S' parameter proposed by Rizzi (1982) (see note xxxx, there is a more fundamental problem regarding sentences like (28) in languages like Italian, etc., where S' but not S is a bounding node. In such a language the final step of movement out of a sentential subject crosses only one bounding node (NP), obeying Subjacency, but the result is still ungrammatical, as indicated by the following Spanish example:

(30) *esta es la authora [S [de la que]i [S [NP varieas traducciones ti] han ganado premios internacionales.]

This is the author by whom several translations have won international
awards.

In addition, the LBC also cannot be completely derived from Subjacency. Although an LBC violation under wh-movement can be ruled out by Subjacency (as shown in (31a)), a violation of the same condition in the passive construction is equally unacceptable, though in the latter case only one bounding node is crossed (see (31b)):

(31)  a.  *Whose_{S} [S did you see [NP t_{i} mother]]?
    b.  *John's_{S} was seen [NP t_{i} mother].^7

There is also evidence that the AC does not reduce to Subjacency. In the ill-formed (32) (= (15b), who is separated from the trace by two S nodes:

(32)  ?*[S' Who_{S} [S did John get jealous [S' because [S I talked to t_{i}]]]]?

However, since because is [-wh], successive-cyclic movement should have been possible. One might suggest that since in (32) the S' is a PP, headed by P but not by COMP, there is no [+wh] COMP position for movement to take place successive-cyclically. However, this solution is not general enough to reduce all cases AC effects to Subjacency. What we saw earlier was that extraction from an adjunct produces bad results, and this is the case regardless of the categorial status of the adjunct. Thus, AP adjuncts and PP adjuncts (in addition to S' adjuncts) all resist extraction, as we saw with (18)-(22), but AP and PP are not bounding nodes for Subjacency.

Summarizing, the Subjacency condition has the effect of deriving the CNPC and the WIC, but the SC, the LBC, and the AC are not fully reducible to Subjacency as formulated in (23).

Before we turn to the status of Bounding Theory in Chinese, it is worthwhile to note three points. First, the bounding conditions we have reviewed are specifically conditions on dependency relations created by movement, but not on other dependency relations. In particular, the anaphoric dependency between a PRO in English and its antecedent is unconstrained by the bounding conditions. This is evidenced by the following examples:
In (33), PRO is located within a complex NP, and in (34) it occurs in a wh-island. These islands, furthermore, occur in the subject position. In both cases, the anaphoric relationship between PRO and John violates both the SC and Subjacency. But, as indicated, this anaphoric relationship must be allowed.

Secondly, observed conditions are largely grammatical in nature, essentially irreducible to semantics. That is, the ill-formed sentences considered above are not ill-formed because their intended meanings are impossible or unnatural. This is evidenced, for example, by the fact that members of each pair in (12)-(14) and the pair (9a), (10) are essentially synonymous, though only one member of each pair is ill-formed.

Finally, by the argument of 'the poverty of the stimulus,' these conditions must be considered to be properties of UG. To acquire these conditions as conditions specific to English, the child would have to resort to negative evidence of the type represented by the ungrammatical sentences above, evidence which is clearly unavailable. It is much more plausible to consider them to be constraints on the linguistic genotype. Just as humans are prevented from having four legs and two horns, so are human languages incapable of expressions beyond the limits of the grammatical constraints. Therefore, even though the constraints have been proposed essentially on the basis of facts of English, we expect them to obtain in Chinese as well--that is, if they have been so formulated in the correct way. If, on the other hand, the predictions are not borne out, then the theory of chains must be enriched so as to allow for a wider range of facts to be expressed.

5.2. Bounding Theory in Chinese

Let us now turn to movement structures in Chinese. As we have seen, a movement structure is characterized by the existence of a chain C of the form (NP, . . . ,
such that (a) all but the last members of C occur in a non-θ-position and (b) the relation between any two adjacent members of C obeys Subjacency and other island conditions. In the first two sections below, let us identify a number of 'movement structures' on the basis of their first general characteristic. Their properties with respect to Subjacency and island constraints will be discussed in sections 5.2.3 and 5.2.4.

5.2.1. A-Chains

Certain structures in Chinese clearly exhibit A-chains. As argued earlier, cleft sentences with shi 'be' may involve raising:

(35) a. [e] shi [Zhangsan mingtian qu kan ta].
    be Zhangsan tomorrow go see him
    It is Zhangsan who will go see him tomorrow.

b. Zhangsan shi [tì mingtain qu kan ta].
    Zhangsan be tomorrow go see him
    It is tomorrow that Zhangsan will go see him.

The alternation between existential and perfective sentences is also a case of raising:

(36) a. [e] you [yige ren zai fangjiang-li].
    have one person at room-in
    There is a person in the room.

b. neige ran tì mei-you [tì kanjian Lisi].
    that person not-have see Lisi
    'That person did not see Lisi.'

Other raising verbs or auxiliaries include hui 'will', keneng 'possible, may', yinggai 'should', and certain uses of kaishi 'begin', nan 'difficult', rongyi 'easy', etc. (cf. A. Li (1985)). Another familiar construction that involves A-chains is the passive construction:

(37) Zhangsan tì bei Lisi kanjian-le tì.
    Zhangsan by Lisi see-Perf
Zhangsan was seen by Lisi.

Following standard assumptions (e.g., Jaeggli (1982), Burzio (1986), Chomsky (1981)), we may assume that the d-structure underlying (37) is (38), where the subject position is not a thematic position and the verb does not assign Case to its object:

\[(38) \quad [\text{e}] \text{ bei Lisi kanjian-le Zhangsan.} \]

by Lisi see-ASP Zhangsan

More specifically, assume that the element \textit{bei} 'by', in addition to being a preposition, has the properties of passive morphology in that it absorbs the Case-assigning property of the verb \textit{kanjian} 'see' and the thematic role (Agent) of the external argument. The agent argument is optionally realized as the object of \textit{bei}, and the internal argument is moved to the subject position, where it receives the Nominative Case.\(^8\)

This sort of analysis can also be extended to sentences like the following:

\[(39) \quad \text{Zhangsan bei wo fa-le wubai-kuai qian.} \]

Zhangsan by I fine-Perf 500-dollar money

Zhangsan was fined 500 dollars by me.

\[(40) \quad \text{Zhangsan bei women dang shagua.} \]

Zhangsan by we treat-as fool

Zhangsan was treated as a fool by us.'

I have assumed, following Thompson (1973), that these sentences involve complex V-O constructions, complex predicates that take external and internal objects. Given the discussion in Chapter 2, the external object occurs in preverbal position. Thus, (40) has the representation (41a) at D-Structure, and (41b) at S-Structure:

\[(41) \quad \begin{align*}
\text{a.} & \quad [\text{e}] \text{ bei women }[\text{VP Zhangsan }[\text{VP dang }\text{ shagua}]]. \\
& \text{by we Zhangsan treat-as fool} \\
\text{b.} & \quad \text{Zhangsan}_i \text{ bei women }[\text{VP }ti[\text{VP dang }\text{ shagua}]] \\
& \text{Zhangsan by we treat-as fool}
\end{align*} \]

In cases such as this, what is being passivized is not the verb \textit{dang} 'treat, regard', but the
V’ phrase **dang shagua** 'regard as a fool'. Movement takes place under the standard conditions (a) that the subject position is dethematized and (b) that the (external) object position is not Case-marked. Case absorption does not take place here (or, it happens vacuously), since the V’, being a phrase, does not assign Case. The Case-assigning property of the internal V₀ is not absorbed, and the internal object is properly Case-marked in postverbal position.

All passive sentences, then, can be characterized by an A-chain involving a Case-marked subject position that is not θ-marked and a θ-marked object position that is not Case-marked.

Another construction that has often been characterized by an A-chain is the **ba**-construction. One common assumption is that the sentence (42a) is derived by the movement of the postverbal object in (42b) to a preverbal position and the insertion of the preposition **ba**:

(42) a. Zhangsan ba Lisi da-le t_i.
    Zhangsan BA Lisi hit-Perf
    Zhangsan hit Lisi.

b. Zhangsan da-le Lisi.
    Zhangsan hit-Perf Lisi.
    Zhangsan hit Lisi.

The external object of a complex predicate may also occur with **ba**:

(43) wo ba Zhangsan fa-le wubai-kuai qian.
    I BA Zhangsan fine-Perf 500-dollars money
    I fined Zhangsan 500 dollars.

(44) women ba Zhangsan dang shagua.
    we BA Zhangsan treat-as fool
    We treat Zhangsan as a fool.

In these cases, however, the **ba**-objects are not moved to the preverbal position. Under
our assumption, an external object is base-generated in preverbal position as [Spec, VP], as sister of V'. Since V' does not assign Case to the external object, and the subject position is not dethematized, ba is inserted as a Case marker, resulting in the desired surface form.

Given this analysis of (43)-(44), it is also possible to derive the simple ba-sentence (42a) without the postulation of movement or an A-chain. The underlying structure of (42a) may simply contain the preverbal object as [Spec, VP] while that of (42b) may have the postverbal object as complement of V'. Since there is only one argument internal to VP, it makes little difference whether the argument is represented as [Spec, VP] or as [Complement, V'].

In the generative literature on Chinese (Tang (1977), Wang (1970), Huang (1982), Goodall (1988), among many others), the sentences in (45) are related to (46) by movement:

(45) a. wo ba shoupai ku-de [[ei] dou shi-tou le].
    I BA handkerchief cry all wet-through ASP
    I cried and got the handkerchief all wet.

b. shoupai bei wo ku-de [[ei] dou shi-tou le].
    handkerchief by I cry all wet-through ASP
    The handkerchief was cried-wet by me.

(46) wo ku-de [shoup dou shi-tou le].
    I cry handkerchief all wet-through ASP
    'I cried so much that the handkerchief got wet.'

In particular, both sentences in (45) are derived from (46) by a process of subject-raising (raising to object in the case of (45a), raising to subject in the case of (45b)). This analysis appears to be attractive in view of the fact that the matrix verb ku 'cry' is intransitive, and therefore that shoup 'handkerchief' cannot have been an argument of the matrix verb, and presumably must originate as the embedded subject.
I shall now assume, however, that the examples in (45) do not involve raising out of an embedded (small) clause, but control into a complex predicate. One important reason for taking this view is the fact that the ba-phrase in (45a) is located in a demonstrably thematic position, an impossible landing site for movement. This and other arguments are presented in detail in Huang (1989), and I will simply describe the analysis here. In (45a), 'the handkerchief' is represented at D-Structure as an object, not as an object of the intransitive verb ku 'cry', but as the external object of a transitive V' phrase, i.e., the complex predicate ku-de Pro dou shi-tou le 'cry so as to make wet':

(47) wo [VP shoupa [V' ku-de [ pro dou shi-tou le]]].
I handkerchief cry all wet-through ASP

In (47), the external object shoupa 'handkerchief' controls the Pro in the complex predicate. Since the external object cannot receive Case from the V' phrase, ba is inserted, giving (45a). No movement chain is formed in such a structure. As another way for 'the handkerchief' to receive Case, the subject position may be dethematized under passivization, and the other shoupa moved to the subject position, forming (45b).

As for the sentence (46), I claim that shoupa does not occur directly as the subject of the embedded clause, either. Rather, the underlying structure of (46) is also (47), and as still another way for the external object to receive Case, the verbal head of the complex predicate, ku-de, undergoes head-movement to the left of the external object, where it assigns a structural Case to the latter. The S-Structure representation of (46) is thus (48):

(48) wo ku-dei [VP shoupa [V' t_i pro dou shi-tou le]].
I cry handkerchief all wet-through ASP

Summarizing, certain constructions in Chinese may be described in terms of A-movement and A-chains. These include sentences with raising auxiliaries or main verbs, and passive sentences. In the case of verb-movement as exemplified in (48), I shall assume with Koopman (1984) that it also forms A-chains.

5.2.2. A'-Chains
Although the formation of wh-questions in Chinese does not involve an overt process of A'-movement, two familiar structures—topicalization and relativization structures—do display dependency chains that are typically associated with wh-movement. Simple examples of these constructions are given below:

(49) nei-ben shu, wo bu xihuan e_i.
that-Cl book I not like
That book, I don't like.

(50) wo bu xihuan e_i de nei-ben shu hen pianyi.
I not like DE that-CL book very cheap
The book that I don't like is very cheap.

In both (49) and (50), there is a chain of the form (NP, e), with an empty category bound by a topic or a head. Not all chains observed in topicalization and relativization need to involve empty categories, however. A topic may be coindexed with a pronoun or an epithet or even a repeated name:

(51) Zhangsan, wo bu xihuan ta.
Zhangsan I not like he
Zhangsan, I don't like him.

(52) Zhangsan, wo bu xihuan zhe-ge wangbadan.
Zhangsan I not like this-Cl bastard
Zhangsan, I don't this bastard.

(53) Zhangsan, wo bu xihuan Zhangsan.
Zhangsan, I not like Zhangsan
Zhangsan, I don't like Zhangsan.

The head of a relative clause may also be coindexed with a pronoun under certain circumstances:

(54) [NP [S ta_i de baba hen youqian de] nei-ge ren_i] zou-le.
he DE father very rich DE that-CL person leave-Perf
The person such that his father is rich has left.

[(55) \[NP \{S\ 'ni \ gen ta shuo hua de\} nei-ge ren\} \ shi shei?

Who is the person such that you spoke with him?

It is well known that topicalization and relativization have many properties in common. To capture this generalization, Kuno (1976) proposed the 'Thematic Constraint', according to which a relative clause construction is well-formed just in case there is a corresponding well-formed topic structure in which the head is used as the topic and the relative clause as a comment about the topic. In the same spirit, Tang (1979) proposed that in the formation of a relativized construction in Chinese, an argument is first topicalized within the relative clause before it is related to the head--so that the relativized argument is always the internal topic. However, there are also important differences between topicalization and relativization that cannot be captured under this hypothesis. For one thing, it is now common knowledge that Chinese topic structures need not involve coindexed chains at all. The following examples are familiar in the literature (see Li and Thompson (1981), Tsao (1977), Tang (1979), etc.; cf. also Chao (1968) and Teng (1974)):

(56) nei-chang huo, xingkui xiaofangdui lai-de kuai.

(As for) that fire, fortunately the fire brigade came fast.

(57) shuiguo, wo zui xihuan xiangjiao.

(As for) fruits, I most like banana

A topic structure without a chain may be acceptable as long as the comment can be understood as saying something about the topic--as long as an 'aboutness relation' holds. This relation is not sufficient, however, to license a relativized construction:

(58) *[NP \{S' xingkui xiaofangdui lai-de kuai de\} nei-chang huo]
Fortunately fire-brigade come fast DE that-CL fire

*the fire such that fortunately the fire brigade came fast

(59) *[NP [S' wo zui xihuan xiangjiao de] shuiguo]

*the fruit such that I like bananas

This contrast between topic and relative structures can be further illustrated below. The verb *fasheng* 'happen' has both an unaccusative and a transitive use. (60) illustrates its unaccusative use with one argument (Theme), and (61) its transitive use with an additional argument (Experiencer):

(60) yiwai fasheng-le.

accident happen-Perf

An accident happened.

(61) tamen fasheng-le yiwai le.

they happen-Perf accident ASP

They had an accident.

Both (60) and (61) may occur in construction with a topic, with or without a chain:

(62) tamen, yiwai fasheng-le.

they accident happen-Perf

(As for) them, an accident happened.

(63) tamen i fasheng-le yiwai le.

they happen-Perf accident ASP

As for them, they had an accident

But only (63), not (62), has a well-formed relativized counterpart:

(64) *[NP [S' yiwai fasheng-le de] neixie ren]

accident happen-Perf DE those person

*the people such that an accident happened

(65) [NP [S' e_i fasheng-le yiwai de] neixie ren_i]

happen-Perf accident DE those person
the people who had an accident.

This shows that the head of a relativized structure must bind a position in the relative clause, though a topic structure may be admitted under a somewhat looser condition. In other respects, a relativized construction may be well-formed where a corresponding topic structure is not. For example, an adjunct can be relativized, but it often cannot be used as a topic:

(66) a. [ta chang ge de shengyin] hen hao ting.
    he sing song DE voice very good hear
    The voice with which he sings is nice to listen to.

   b. *nei-ge shengyin, ta chang ge.
       that-CL voice he sing song

(67) a. [ta duidai Lisi de fangshi] hen bu hao.
    he treat Lisi DE style very not good
    The manner in which he treated Lisi is very bad.

   b. *zhei-ge fangshi, ta duidai Lisi.
       this-CL manner he treat Lisi

Thus, the well-formedness of a topic structure is neither a necessary nor a sufficient condition for the well-formedness of a corresponding relativized structure. This falsifies any analysis that relies crucially on Kuno's (1976) Thematic Constraint. In what follows, I will assume that relative clause structures may be formed independently of topic structures, their similarities being derived from other general principles of grammar.

The facts we have reviewed so far about topicalization show that it must be possible to base-generate topics in Chinese, with neither a movement process nor a base-generated empty category. It may be tempting to conclude from here, Li and Thompson (1976) do, that all topic structures in Chinese are generated in this way. However, such a claim is neither logically necessary nor empirically supported. Consider, for example, the sentences below:
In (68a), the pronoun ta may be understood to be coreferential with the topic, but in (68b) this coreference relation is not allowed. If all topic structures involve neither movement nor empty categories, then the difference in interpretation between these sentences cannot be captured. Clearly, the ungrammaticality of (68b) is directly related to the fact that the pronoun ta cannot be coindexed with Zhangsan in (69):

(69)  *ta\textsubscript{i} bu renshi Zhangsan\textsubscript{i}.

*He\textsubscript{i} doesn't know Zhangsan\textsubscript{i}.

A theory that postulates movement in the derivation of (68b) from something like (69) can easily capture this fact. The ill-formedness of (68b) follows from whatever principle that also rules out the relevant interpretation in the source structure (69). In the current framework, (69) is ruled out by Binding Theory, whose principles are given in (70):\textsuperscript{13}

(70)  a. An anaphor is bound in its governing category.

b. A pronominal is free in its governing category.

c. An R-expression is free.

In particular, since Zhangsan in (69) is a referential expression, by Principle C (= (70c)) it must not be A-bound or coindexed with a c-commanding NP in an A-position. But in (69) Zhangsan is A-bound by the subject ta, so the sentence is ruled out by Principle C. Now (68b) can be ruled out in the same way, if it is assumed that there is an EC in the object position and that the EC is a variable. Since a variable is also an R-expression by definition,\textsuperscript{14} it also cannot be A-bound:

(71)  *Zhangsan\textsubscript{i}, ta\textsubscript{i} bu renshi e\textsubscript{i}.
Similarly, the contrast below can be accounted for by the fact that (72b) but not (72a) contains an empty category coindexed with both the topic and the subject ta:

\[(72)\]  
\[\text{a. Zhangsan}, \text{ ta} \text{ shuo Lisi zou-le.} \]
Zhangsan he say Lisi leave-Perf
Zhangsan, he said that Lisi left.
\[\text{b. } *\text{Zhangsan, ta} \text{ shuo Lisi kanjian-le e}. \]
*Zhangsan he say Lisi see-Perf
*Zhangsan, he said that Lisi saw e.

(72b) is ruled out, again by Principle C, on a par with (73) and cases involving 'strong crossover' like (74):

\[(73)\]  
\[*\text{ta} \text{ shuo Lisi kanjian-le Zhangsan}. \]
he say Lisi see-Perf Zhangsan
*He said that Lisi saw Zhangsan.
\[(74)\]  
\[*\text{Who di} \text{ say th at I saw ti}? \]

A different kind of contrast points to the same conclusion:

\[(75)\]  
\[\text{a. } *\text{ziji de shu, Zhangsan dou shui-zhao-le.} \]
self 's book Zhangsan even fall-asleep-Perf
*Self's book, even Zhangsan fell asleep.
\[\text{b. } [\text{ziji de shu}], \text{ Zhangsan dou bu xiang kan e}. \]
self 's book Zhangsan even not want read
His own book, even Zhangsan did not want to read.

(75a) is ill-formed because the reflexive anaphor ziji 'self' is not bound in its governing category in accordance with Principle A of Binding Theory (70a).\(^{15}\) (75b), on the other hand, exhibits the so-called 'reconstruction effect'. Although ziji is also not c-commanded by Zhangsan at S-Structure, the hypothesis that this sentence is formed by movement allows one to claim that Principle A was satisfied at a level of representation before movement took place.\(^{16}\) Alternatively, the fact that the topic containing ziji is
coindexed with an empty category c-commanded by Zhangsan allows us to count the anaphor as being 'bound' in some extended sense by the latter at S-Structure, satisfying Principle A.\textsuperscript{17}

In short, the contrasts we see in (68), (72) and (75) follow naturally from the hypothesis that the (b) sentences, but not the (a) sentences, involve movement or at least the existence of an EC. This difference in turn follows from the Projection Principle and the fact that only the (b) sentences are transitive sentences with missing objects. These contrasts argue strongly against the view taken by Li and Thompson (1976).

The contrasts also argue against the view of Xu and Langendoen (1985) and Xu (1986), which is essentially a restatement of Li and Thompson's. Xu and Langendoen argue that Chinese topic structures are not formed by movement at all, but unlike Li and Thompson, they adopt the view that the (b) sentences above do contain an EC. Unfortunately, however, they consider the EC to be a 'free empty category' (FEC). More specifically, according to Xu (1986), the FEC may be freely interpreted as an anaphor, pronominal or an R-expression as long as the 'aboutness requirement' and other Gricean principles of cooperation are met. Except for its conformity to the Projection Principle, however, the postulation of an FEC is essentially the same as the view that there is no EC at all. Thus, according to Xu's (1986), (68b) should be well-formed because it contains an object FEC which, if coindexed with the subject ta, can be admitted as an anaphor. (72b) should be well-formed because the object FEC can be coindexed with ta and interpreted as a pronominal. Together, the FEC theory and the Gricean principles predict incorrectly that (68b) and (72b) should be as good as their (a) counterparts and as good as the sentences below:

\begin{align*}
(76) & \quad \text{Zhangsan}_i, \text{ta}_i \text{ renshi ziji}_i, \\
& \quad \text{Zhangsan he know self} \\
& \quad \text{Zhangsan, he knows himself.} \\
(77) & \quad \text{Zhangsan}_i, \text{ta}_i \text{ shuo Lisi bu renshi ta}_i.
\end{align*}
Zhangsan he say Lisi not know he
Zhangsan, he said that Lisi didn't know him.

I shall assume, then, that Chinese topic (and relative) structures may involve an empty category of a restricted kind. It is already clear that the EC cannot be an anaphor. Whether it is base-generated (as a pro) or created by movement (as a wh-trace) is a more subtle issue. Xu and Langendoen argue that Chinese topic structures do not involve movement or traces, basing their main argument on the claim that such structures do not exhibit the effects of Subjacency and other island constraints. As I will show below, this claim is not entirely correct as it grosses over important details. Although it is clear that some ECs observed in Chinese topic and relative structures must be base-generated, conceptual and empirical considerations suggest that movement may also be involved in creating other ECs.

5.2.3. Some Bounding Effects

The contrast between (78*) and (79*) shows that raising cannot apply across more than one bounding node at a time:

(78*) a. [S e yinggai [S e shi [S e keneng [S ta hui lai]]]].
    should be possible he will come
    It should be possible that he will come.

b. [S ta_i yinggai [S t_i shi [S t_i keneng [S t_i hui lai]]]].
    he should be possible will come
    He should be likely to come.

(79*) a. [S e shi [S ni shuo [S ta hui lai]]].
    be you say he will come
    It is you who said that he will come.

b. *[S ta_i shi [S ni shuo [S t_i hui lai]]].
he be you say will come

In the derivation of (78*a), movement may proceed through each empty non-θ subject position, crossing one S at each time. In (79*a), however, the intermediate subject position is a θ-position and it is lexically filled with an NP. This rules out successive cyclic raising, and (79*b) is excluded by Subjacency.

However, A-chains are subject to a stricter condition than Subjacency or the other island constraints. For example, it is impossible to passivize across a subject.

Corresponding to the active (80*a), we cannot have (80*b):

(80*) a. wo faxian [S Lisi da-le Zhangsan].
I find Lisi hit-Perf Zhangsan
I discovered that Lisi hit Zhangsan.

b. *Zhangsan bei wo faxian [S Lisi da-le tì].
Zhangsan by I find Lisi hit-Perf
*Zhangsan was discovered by me Lisi to have hit.

The movement in (80*b) crosses only one S, satisfying all the island constraints, but the sentence is still ill-formed. One cannot attribute the ill-formedness of (80*b) to idiosyncratic restrictions imposed by the verbs, since each verb involved independently permits passivization:

(81*) Lisi bei wo faxian-le.
Lisi by I discover-Perf
Lisi was discovered by me.

(82*) Zhangsan bei Lisi da-le.
Zhangsan by Lisi hit-Perf
Zhangsan was hit by Lisi.

In fact, (80*a) has a passive counterpart in which the embedded subject Lisi is fronted, a case of subject-raising:

(83*) Lisi tì bei wo faxian [S tì da-le Zhangsan].
Lisi was found by me to have hit Zhangsan.

Following Chomsky (1981), I shall assume that the correct explanation for the ill-formedness of (80*b) is Principle A of Binding Theory. Assuming that the trace of an A-chain is an anaphor, such a trace must have a c-commanding antecedent in its governing category. In (80*b), the embedded S is the governing category for the trace, since it is the minimal category that contains the trace, its governor (the embedded verb da) and an accessible subject (Lisi) (see note (xxxx)). However, the trace is not bound within the embedded S, in violation of Principle A. On the other hand, in the grammatical (83*), the embedded subject trace is bound by the matrix subject in accordance with Principle A. We may assume either that the trace is governed by the matrix verb, according to which the matrix S is its governing category. Or we may assume that the trace is internally governed by the embedded INFL. The embedded INFL contains no Agr, hence no SUBJECT accessible to the trace, since Chinese, as is well known, does not exhibit subject-verb agreement. The minimal category that contains an accessible subject is again the matrix clause. Since the trace is bound in the matrix S, Principle A is fully satisfied. All other legitimate cases of raising (e.g. (78*b)) are admitted in the same way. The pattern of allowable A-chains thus mirrors that of allowable binding of the reflexive ziji:

(84*)

a. Zhangsan zhidao [S wo ı chang piping ziji].
   Zhangsan know I often criticize self
   Zhangsan knows that I often criticize myself.

b. *Zhangsan ı zhidao [S wo chang piping ziji].
   Zhangsan know I often criticize self

c. Zhangsan zhidao [S ziji chang piping bieren].
   Zhangsan know self often criticize others
   Zhangsan knows that he often criticizes others.
In both (a) and (b) above, the governing category for \textit{ziji} is the embedded S. Since \textit{ziji} is bound in this category in (a) but not in (b), the latter is ruled out by Principle A. In (c), the embedded S does not contain a SUBJECT accessible to \textit{ziji}, so the governing category for \textit{ziji} is the matrix S. The reflexive may therefore be bound by the matrix subject in this case.

Given that A-chains are subject to Principle A, any A-Chain that violates Subjacency will in general also violate Principle A. For example, although the ungrammatical (79*b) may be ruled out by Subjacency, the sentence is also independently ruled out by Principle A, according to which the trace of raising should be bound by the embedded subject \textit{ni} 'you'. Facts about A-chains in Chinese thus do not provide evidence for Subjacency. In what follows I shall concentrate on A'-chains only.

To begin with, note that it is possible to topicalize or relativize an element that is deeply embedded in a complement clause:

(85*)  Zhangsan, wo zhidao Lisi juede nimen dou hui xihuan e_i.

\begin{quote}
Zhangsan, I know Lisi feel you all will like
\end{quote}

(86*)  wo zhidao Lisi juede nimen dou hui xihuan e_i de ren_i lai-le.

\begin{quote}
The person that I know that Lisi feels that you will all like came.
\end{quote}

Under standard assumptions, these sentences do not constitute a violation of Subjacency. We may assume that there is an empty COMP position in each S'. Movement may proceed successive-cyclically crossing one bounding node at a time.

Consider now extraction from a complex NP. The sentences in (87*) show that an object of a relative clause cannot be topicalized or relativized:

(87*)  a.  [S wo rensi [NP henduo [S [S xihuan Lisi ] de] ren]].

\begin{quote}
I know many like Lisi DE person
\end{quote}
I know many people who like Lisi.

b. *Lisi, [S wo renshi [NP henduo [S' [S xihuan e_i] de] ren]].

Lisi I know many like DE person

*Lisi, I know many people who like e_i.

c. *[S wo renshi [NP henduo [S' [S xihuan e_i] de] ren]] de

I know many like DE person DE nei-ge laoshi xing Wang.

that-CL teacher surname Wang

*The teacher who I know many people who like e_i has the surname Wang.

Similarly, ungrammatical sentences result when a subject of a relative clause is topicalized or relativized:

(88*) a. [S wo hen xihuan [NP [S' [S Lisi chang ge] de] shengyin]].

I very like Lisi sing song DE voice

I like the voice with which Lisi sings.

b. *Lisi, [S wo hen xihuan [NP [S' [S e_i chang ge] de] shengyin]].

Lisi I very like sing song DE voice

Lisi, I like the voice with which e_i sings.

c. *[S wo hen xihuan [NP [S' [S e_i chang ge] de] shengyin]] de

I very like sing song DE voice DE nei-ge ren_i shi yi-ge yinyue laoshi.

that-CL person be one-CL music teacher

*The person_i who I like the voice with which e_i sings is a music teacher.

Each of the (b) and (c) sentences becomes acceptable if the gap [e_i] is replaced by a resumptive pronoun, indicating that the ill-formed sentences are not semantically or pragmatically anomalous. Thus, for example, (89*) and (90*) are entirely acceptable:
(89*) Lisi, [S wo hen xihuan [NP [S' [S taı̈ chang ge] de] shengyin]].
Lisi I very like he sing song DE voice
Lisi, I like the voice with which sings.
(90*) [S wo hen xihuan [NP [S' [S taı̈ chang ge] de] shengyin]] de
I very like he sing song DE voice DE nei-ge renı̈ shi yi-ge yinyue laoshi.
that-Cl person be one-CL music teacher
The person who I like the voice with which he sings is a music teacher.

The contrasts between the ill-formed (b) and (c) sentences and the well-formed (89*) and
(90*) can be attributed to Subjacency, in particular the CNPC part of the condition. The
condition also correctly rules out extraction from appositive clauses:21
(91*) a. [S wo tingdao [NP [S' [S Lisi yao jiehun] de] xiaoxi]].
I hear Lisi want marry DE news
I heard the news that Lisi is getting married.
Lisi I hear want marry DE news
*Lisi, I heard the news that eı̈ is getting married.
c. *[S wo tingdao [NP [S' [S eı̈ yao jiehun] de] xiaoxi]] de
I hear want marry DE news DE nei-ge renı̈ shi wo de pengyou.
that-CL person be I DE friend
*The personı̈ who I heard the news that eı̈ is getting married is my friend.

That topicalization and relativization in Chinese are constrained by the CNPC has been
noted by a number of linguists before (see e.g., Tang (1977) and Chen (1975).) This is
not unexpected, of course, since such a constraint is hardly learnable on the basis of
primary linguistic data and therefore must be attributed to UG. In fact, we expect that
the other island constraints, the LBC, the WIC, the AC and the SC, should all apply in
Chinese as well. Let us take up each of these in turn.

Consider the LBC. The following sentences are ungrammatical, as predicted:

(92*) *Zhangsan, wo kanjian-le [ei baba].

Zhangsan I see-Perf father
Zhangsan, I saw [his] father.

(93*) wo kanjian [ei baba] de nei-ge ren lai-le.

I see father DE that-CL person come-Perf
The person such that I like [his] father has come.

The AC apparently also makes correct predictions. As shown below, extraction from
within an adjunct is prohibited, whether the extracted element is a subject or an object:

(94*) a. zhe-jian shi [gen Lisi mei lai] mei you guanxi.

this-CL matter with Lisi not come not have relation
This matter is not related to Lisi's not having come.


Lisi this-CL matter with not come not have relation
Lisi, this matter is not related to [his] not having come.

(95*) a. wo [yinwei ni piping-le Lisi] hen bugaoxing.

I because you criticize-Perf Lisi very unhappy
I am very unhappy because you criticized Lisi.

b. *Lisi, wo [yinwei ni piping-le ei] hen bugaoxing.

Lisi I because you criticize-Perf very unhappy
Lisi, I am very unhappy because you criticized [him].

Consider next the WIC. As we saw above, wh-movement out of an indirect
question in English produces ungrammatical results:

(96*) a. ??Who did you wonder who likes most t?

b. ??That man, I don't know who likes most t.
Unlike the cases in English, however, it is quite easy to topicalize out of an indirect question in Chinese:\(^{22}\)

\[(97^*)\]  
\[\text{Zhangsan,}\ [s' [s \text{ wo xiang-zhidao} [s' [s \text{ shei} \ zui \ xihuan e_i]]]].\]

Zhangsan  I  wonder  who  most  like

??Zhangsan, I don't know who likes most.

\[(98^*)\]  
\[\text{nei-ben shu,}\ [s' [s \text{ wo bu} \ zhidao} [s' [s \text{ shei mai-zou-le} \ e_i]]].\]

that-CL book  I  not  know  who  buy-away-Perf

??That book, I don't know who bought.

Relativization out of an indirect question appears to be equally free:

\[(99^*)\]  
\[\text{I}\ [s' [s \text{ wo xiang-zhidao} [s' [s \text{ shei} \ zui \ xihuan e_i]]] \text{ de}] \text{ nei-ge}\]

I  wonder  who  most  like  DE  that-CL

ren  zou-le.

person leave-Perf

??The person who I wonder who likes most has left.

\[(100)\]  
\[\text{I}\ [s' [s \text{ wo bu} \ zhidao} [s' [s \text{ shei mai-zou-le} \ e_i]]] \text{ de}] \text{ nei-ben}\]

I  not  know  who  buy-away-Perf  DE  that-CL

shu_i  yijing  jueban  le.

book already out-of-print ASP

??The book which I don't know who bought is already out of print.

In fact, extraction may occur across more than one indirect question:

\[(101)\]  
\[\text{that-CL book}\ [s' [s \text{ shei xiang-zhidao} \text{ shei mai-zou-le} \ e_i]?}\]

that-CL book  who  wonder  who  buy-away-Perf

??*That book, who wondered who has bought t?

Thus, unlike the cases of CNPC, LBC and AC, Chinese topicalization and relativization do not exhibit any WIC effect. While this might appear to pose a problem for the WIC as a principle of UG, a moment's thought suggests that this is not the case. Since Chinese
questions are formed without wh-movement in Syntax, the wh-phrases do not occupy a position in COMP at S-Structure. That is, at this level, no wh-island exists in Chinese. Movement may take place from COMP to COMP exactly as it happens in sentences with embedded declaratives. Therefore, the fact that Chinese topicalization and relativization do not exhibit WIC effects is just what one would expect. What about the status of the SC? Previous studies have shown that extraction out of a sentential subject may lead to ungrammatical strings (see Tang (1977), Paris (1979), Huang (1982)):

(102) *zhe-ben shu_i [Lisi xiang kan e_i zhen qiguai].
    this-CL book Lisi want read really strange
    *This book_i, that Lisi would read e_i is indeed strange.

(103) *[[Lisi xiang kan e_i] zhen qiguai de] nei-ben shu_i hen hao.
    Lisi want read really strange DE that-CL book very good
    *The book that that Lisi would read e_i is indeed strange is very good.

More recently, however, it has been shown that not all extractions from sentential subjects are prohibited (see Huang (1984)). The following sentences differ from (102)-(103) minimally in form, but contrast with them in acceptability:

(104) zhe-ben shu_i, [[Lisi kan e_i] zui heshi].
    this-CL book Lisi read most appropriate
    This book, for Lisi to read [it] is most appropriate.

(105) [[Lisi kan e_i] zui heshi de] nei-ben shu_i hen hao.
    Lisi read most appropriate DE that-CL book very good
    The book that it is most appropriate for Lisi to read is very good.

Extraction is also possible from the sentential subject of an embedded clause:

(106) Xiaoming_i, [wo juede [[Lisi zhaogu e_i] zui anquan].
    Xiaoming I think Lisi care-for most safe
    Xiaoming, I think that for Lisi to care for [him] is the safest.

The difference in grammaticality observed here seems to be related to the fact that the ill-
formed (102) and (103) involve factive predicates, whereas the well-formed (104)-(106) do not. It has been observed, e.g., by Givon (1973), that factivity contributes to the referentiality or specificity of certain arguments. If this is right, then we can attribute the ill-formedness of (102) and (103) to the Name Constraint of May (1977) or the Specificity Condition of Fiengo and Higginbotham (1982), which may be construed as a filter in the form of (107): (Reference to Chapter 4???)

(107) \^[X P \ldots e \ldots]\]

where \(X P\) is specific and \([e]\) is free in \(X P\).

That is, specific arguments are opaque in the sense that they cannot contain free variables. In (102) and (103), the sentential subjects are specific, owing to the factivity of their predicates, so these sentences are ruled out as the sentential subjects each contain a free variable. In (104)-(106), the relevant predicates are non-factive, so these sentences are not affected by (107). Since these sentences are well-formed, and the ungrammatical ones in (102) and (103) are independently ruled out, we must conclude that topicalization and relativization in Chinese do not display SSC effects.

As for extraction from non-sentential subjects, we can see that this is also possible. Assuming that the subject NP \(baba\) 'father' contains an EC as its (inalienable) possessor, we see that this EC can form an A'-chain with a clause-external topic or head:

(108) \(Zhangsan_i, [[e_i baba] \ hen \ youqian].\)

\(Zhangsan\) father very rich

\(Zhangsan, [his] father is rich.\)

(109) \([e_i baba] \ hen \ youqian de] nei-ge xiaohai hen bulimao.\)

father very rich DE that-CL child very impolite

The child whose father is rich is very impolite.

Summarizing, then, we have seen in this section that overt A'-chains exhibit the expected effects of the CNPC, the LBC, and the AC. They do not exhibit WIC effects, and this is also expected given that no overt wh-islands exist in this language. However,
contrary to what is expected, such A'chains do not exhibit any observable SC effects. This last fact is most interesting because it raises the question why the SC obtains in English but not in Chinese--and not the other way round. On a priori grounds, we know that the difference between the two languages cannot be the result of simple parameter setting (on the basis of a parameter like \[+/-SC\]). It is then of great interest how the observed cross-linguistic differences may be explained on more principled grounds. Let us examine the relevant facts in more detail.

5.2.4. Some Problems

The facts of bounding in Chinese are in fact more complex than just described. To see this, consider again (108) and (109). In addition to showing the lack of SC effects in Chinese, these examples also present for the LBC, since they involve the extraction of a left-branch NP. (108)-(109) thus form a sharp contrast with (92*) and (93*). The former show that extraction seems to be free from the constraint of the LBC, but the latter show just the contrary. In fact, a similar problem also arises with the CNPC. The following sentences apparently violate the CNPC but are perfectly acceptable:

(110)  Zhangsan, \([S'[S[NP[S[S xihuan ei] de] ren] hen duo]].\)

Zhangsan like DE person very many
Zhangsan, people who like [him] are many.


like DE person very many DE that-CL
laoshi xing Wang.

teacher surname Wang
The person such that the people who like [him] are many has the surname Wang.

Furthermore, certain apparent AC violations are also acceptable. In contrast to the ill-formed (95*b), (112) is acceptable:
(112) Lisi, yinwei ni piping-le e, (suoyi) wo hen bugaoxing.
Lisi because you criticize-Perf so I very unhappy

(As for) Lisi, because you criticized [him], I am very unhappy.

We are now in a dilemma. Some examples appear to obey the CNPC, the LBC, and the AC, but others seem to violate these constraints. Needless to say, it won't do to simply conclude on the basis of (110)-(112) that Chinese does not exhibit familiar island effects, for this would leave the ungrammatical examples given in Section 5.2.3. completely unaccounted for.

A comparison of (108)-(109) with the ungrammatical (92*) and (93*) above reveals a subject-object asymmetry: in (108) and (109), extraction has taken place from the left branch of an NP in subject position, but in (92*) and (93*) left-branch extraction has taken place from an object position. The same asymmetry can be observed between the grammatical and ungrammatical extraction from a complex NP illustrated so far. For a clearer contrast, compare the sentences in (113) and (114). (The (b) sentences are repeated from (88*b) and (88*c)):

(113) a. Lisi, [S [NP [S' [S e; chang ge] de] shengyin] hen haoting].
   Lisi sing song DE voice very good
   'Lisi, the voice with which [he] sings is very good.'

b. *Lisi, [S wo hen xihuan [NP [S' [S e; chang ge] de] shengyin]].
   Lisi I very like sing song DE voice
   *Lisi, I like the voice with which e; sings.

(114) a. [S' [S NP [S' [S e; chang ge] de] shengyin] hen haoting] de
       sing song DE voice very good DE
       nei-ge ren; shi yi-ge yinyue laoshi.
   that-CL person be one-CL music teacher
   The person; who the voice with which [he] sings is good is a music teacher.
b. *[S wo hen xihuan [NP [S' [S e_i chang ge] de] shengyin]] de I very like sing song DE voice DE nei-ge ren_i shi yi-ge yinyue laoshi.
that-Cl person be one-CL music teacher
*The person_i who I like the voice with which e_i sings is a music teacher.

The facts we have seen indicate that the CNPC and the LBC appear to have an island effect on extraction only when a given island occurs in object position, but not when it occurs as a subject. Seen in this light, the lack of SC effects in Chinese is just a special instance of this more general subject-object asymmetry.

In fact, not only do islands in subject position fail to exhibit island effects. An object island also ceases to resist extraction once it is preposed to sentence-initial position. In contrast to (113), the sentence (115) is again well-formed:

(115) Lisi_i, [NP [S' [S e_i chang ge] de] shengyin], [S wo hen xihuan].
Lisi sing song DE voice I very like
Lisi, the voice with which [he] sings, I like.

Similarly, LBC effects also disappear once the NP from which left-branch extraction takes place is preposed. Thus in contrast to (116a) (=92*)), (116b) is well-formed:

(116) a. *Zhangsan_i, wo kanjian-le [e_i baba].
Zhangsan I see-Perf father
Zhangsan, I saw [his] father.
b. Zhangsan_i, [e_i baba], wo kanjian-le.
Zhangsan father I see-Perf
Zhangsan, [his] father, I saw.

This observation is apparently also true of extraction out of adjunct. Compare (112) above with (117) (=95*b)) below:

(117) *Lisi_i, wo [yinwei ni piping-le e_i] hen bugaoxing.
Lisi I because you criticize-Perf very unhappy
Lisi, I am very unhappy because you criticized [him].

In (117) the adjunct occurs after the subject and extraction out of the adjunct is barred.

In (112), the adjunct occurs clause-initially, and extraction becomes possible.

The asymmetries we have observed clearly point to the following generalization:

(118) In Chinese, syntactic islands cease to be islands in sentence-initial position.

The theoretically interesting questions that we need to answer are therefore (a) why generalization (118) should obtain, and (b) why it only obtains in Chinese but not, say, in English.

5.3. A Modular Approach to Bounding in Chinese

I would like to propose that the key answer to the questions just raised is that the observed apparent violations of Subjacency and other island conditions arise from the possibility of base-generating an empty pronoun in Chinese (but not in English) that may be properly coindexed with a topic or a head under appropriate conditions.

5.3.1. The Distribution of Empty Pronouns

A well known difference among languages is that some languages allow the occurrence of an empty pronominal in a governed position while others do not. Italian and Spanish are well known pro-drop languages, while English and French are non-pro-drop languages. Thus, in English-type languages, although a pronominal EC may appear in the ungoverned subject position of an infinitival clause, it may not appear in the subject position of a finite clause:

(119) a. John tried [PRO to win].
    b. John persuaded Bill [PRO to win].

(120) a. *John knows that [pro will win].
    b. *John told Bill that [pro can win].
In languages like Spanish or Italian, however, a pronominal EC is allowed in the subject position of a tensed clause. Thus, in contrast to the ungrammatical (120) in English, the following Spanish sentences are entirely well-formed: (check diacritics???)

(121) Jose sabe que [pro ha sido visto por Maria].
      Jose knows that has been seen by Maria

In Chomsky (1982), the EC that appears in the ungoverned position in (119) is postulated to be a 'pronominal anaphor', or PRO, and the fact that it is ungoverned follows from Binding Theory, more specifically from the assumption that, if it were governed, it would have a governing category in which it must be bound (as an anaphor) and free (as a pronominal) at the same time, an impossible situation. By the same assumption, an EC that appears in a governed position cannot be a pronominal anaphor. In cases where such ECs are allowed (as in the Spanish example (121)), Chomsky assumes that they are pure pronominals, i.e., [+pronominal, -anaphor] categories. The occurrence of a pure pronominal, or the 'little pro', in one language but not in another constitutes what has been descriptively referred to as the 'pro drop' or 'null subject' parameter. It is a matter of great importance how this descriptive parameter can be derived in explanatory terms, though this is not our main concern.

Chinese apparently belongs to the type of language that allows a pronoun to drop from a governed position. Although Chinese sentences are not marked for tense, a distinction between what is intuitively a finite clause and a non-finite clause is essential in predicting certain interesting facts. Thus, sentences with 'try' and 'force' subcategorize for non-finite complements, as their English counterparts do:

(122) Zhangsan shefa [PRO mai nei-ben shu].
      Zhangsan try buy that-CL book
      Zhangsan tried to buy that book.

(123) Zhangsan bi Lisi [PRO mai nei-ben shu].
Zhangsan force Lisi to buy that book.

Assuming that the subject position of a non-finite clause is ungoverned, we correctly predict that the embedded subject position cannot be filled by a lexical NP:

(124) *Zhangsan shefa [ta mai nei-ben shu].

Zhangsan try he buy that-CL book

(125) *Zhangsan bi Lisi [ta mai nei-ben shu].

Zhangsan force Lisi he buy that-CL book

This is because, according to Case Theory, a lexical NP needs Case and Case is assigned only to governed NPs. (124) and (125) are thus ruled out by the Case Filter, as their English counterparts are. Furthermore, if we assume that the occurrence of a modal or an aspect marker like the perfective -le makes a given clause finite (that these elements govern their subject position), we predict that the embedded clause in (124) and (125) cannot take a modal or the marker -le. The first prediction is borne out as shown in (126):

(126) *Zhangsan shefa [PRO neng mai nei-ben shu].

Zhangsan try can buy that-CL book

This sentence can be ruled out on a par with its English counterpart, *John tried PRO can buy the book. Notice that the nearly synonymous John tried to be able to buy the book is well-formed, indicating that the ill-formedness of (126) cannot be attributed to a simple semantic reason.

As for the occurrence of aspect markers, it turns out that a marker like -le can appear in the embedded clause:

(127) Zhangsan bi Lisi [PRO mai-le nei-ben shu].

Zhangsan force Lisi buy-Perf that-CL book

Zhangsan forced Lisi to buy that book.

However, there is good reason to assume that the perfective -le occurs in construction not
with the embedded verb alone, but with the sequence \textbf{bi Lisi PRO mai} 'force Lisi to buy' as a whole. In other words, -le is attached to the complex predicate 'force Lisi to buy'. Evidence for this comes from the fact that when (127) is negated, the negative perfective form \textbf{mei you} 'not have' must appear before the matrix verb:

(128)  a. Zhangsan mei you bi Lisi [PRO mai nei-ben shu].
       Zhangsan not have force Lisi buy that-CL book
       Zhangsan did not force Lisi to buy the book.

b. *Zhangsan bi Lisi [PRO mei you mai nei-ben shu].
       Zhangsan force Lisi not have buy that-CL book

Furthermore, in sentences like (127), the embedded object may become the matrix subject under passivization, in apparent violation of Principle A of Binding Theory:

(129) nei-ben shu bei Zhangsan bi Lisi mai-zou-le ti.
      that-CL book by Zhangsan force Lisi buy-away-Perf
      That book was 'forced-Lisi-to-buy' by Zhangsan.

If we assume that in (129) the sequence \textbf{bi Lisi mai-zou-le} 'forced Lisi to buy' forms a complex predicate taking 'that book' as its underlying object, the NP-trace will be properly bound in its governing category.\footnote{23}

We have established the need for recognizing the concept of a non-finite clause with an ungoverned subject position in Chinese. Now, the non-finite clauses are to be distinguished from main clauses and other embedded clauses, which are intuitively finite. Main clauses in Chinese (as in English) must be finite containing a governed subject position, because there is no main clause whose subject is obligatorily null (as would be the case if its subject was ungoverned). Furthermore, clauses embedded under 'think', 'say', etc., differ from those under 'force' and 'try' in essential ways:

(130)  a. Zhangsan shuo [ta mingtian lai].
       Zhangsan say he tomorrow come
       Zhangsan said that he would come tomorrow.
b.  Zhangsan shuo [ta mai-le nei-ben shu].
    Zhangsan say he buy-Perf that-CL book
    Zhangsan said that he bought that book.

c.  Zhangsan shuo [ta bu neng lai].
    Zhangsan say he not can come
    Zhangsan said that he could not come.

The embedded clauses in (130) each contain a lexical subject, and the embedded verb may take the aspect marker -le (130b) or a modal (130c). Furthermore, the perfective aspect -le can be directly negated within the embedded clause:

(131)  Zhangsan shuo [ta mei you mai nei-ben shu].
    Zhangsan say he not have buy that-CL book
    Zhangsan said that he did not buy that book.

All of these facts follow if we assume that the embedded clauses are finite and that their subjects are governed and Case-marked (by an Infl element). Now, notice that the embedded subject may be replaced by an EC:

(132)  a.  Zhangsan shuo [[e] mingtian lai].
    Zhangsan said that [he] would come tomorrow.

    b.  Zhangsan shuo [[e] mai-le nei-ben shu].
    Zhangsan said that [he] bought that book.

    c.  Zhangsan shuo [[e] bu neng lai].
    Zhangsan said that [he] couldn't come.

    d.  Zhangsan shuo [[e] mei you mai nei-ben shu].
    Zhangsan said that [he] didn't buy that book.

In each case the EC is most naturally θ-bound by the matrix subject, as the overt pronoun in (130)-(131) is. This means that the EC is a pronominal (not a trace). Furthermore, since the EC is clearly governed (given the facts of (130)-(131)), what we have here is a governed pronominal EC, an instance of pro.
Similarly, the empty subject of a resultative clause can be identified as an instance of the governed pro:

(133)  Zhangsan lei-de [pro bu neng shuo hua].
       Zhangsan tired-till not can say word
       Zhangsan was so tired that [he] could not speak.

(134)  Zhangsan ku-de [pro liu-chu-le yanlei].
       Zhangsan cry-till flow-out-Perf tears
       Zhangsan cried so much that [he] had tears coming out.

The resultative clause may contain a modal (as in (133)) or an aspect (as in (134)). The aspect can be negated exclusively within the clause:

(135)  Zhangsan mang-de [pro lian yi-ben shu dou mei you nian].
       Zhangsan busy-till even one-CL book all not have read
       Zhangsan was so busy that [he] didn't even read a book.'

There is good reason to claim, then, that Chinese is a pro drop language, on a par with Spanish and Italian, but in contrast to English-type languages.24

5.3.2. The Generalized Control Theory

The establishment of Chinese as a pro drop language poses an important problem for a plausible theory that purports to explain the pro drop parameter. It has been observed by Taraldsen (1982) (and earlier since Jespersen (1965 [=1924]) that pro drop occurs often in a language with a relatively rich agreement system (like Italian) but not in a language with a degenerate agreement system (like English). Chomsky (1982) takes this as a reflection of the requirement that a pro must be 'identified' in some way, that is, its reference must be determined up to a certain degree in a given environment--essentially the condition of recoverability on deletion (Chomsky (1964)). In a language with rich enough agreement, a subject pronoun may drop because its content can be recovered from the agreement markings on the verb. In a language like English,
however, a subject pronoun may not drop, because the agreement markings are too meager to sufficiently determine its content. This theory of pro drop also explains why pro drop does not occur with objects in Italian-type languages (given that there is no verb-object agreement in such languages), and predicts certain other important cross-linguistic facts.

This agreement-based theory runs into a serious problem when languages like Chinese are considered. Chinese verbs are not marked for agreement at all, but pro drop is allowed. This falsifies any theory taking 'rich agreement' as the single licenser for pro drop. One might conclude, instead, that the identification requirement should be abandoned altogether. However, as I have argued in Huang (1984, 1989), this latter conclusion is neither needed nor justified. For one thing, the ungoverned PRO, which occurs in the absence of agreement in both pro-drop and non-pro-drop languages, is nevertheless often in need of identification by an antecedent, i.e., it is subject to obligatory control. For another, the governed pro in Chinese, though not identified by agreement markings, also often needs to be identified by an antecedent. In the sentences (133)-(135), for example, the pro is obligatorily controlled by the matrix subject. (Under certain circumstances, both PRO and pro may have arbitrary or pragmatically inferred reference.) In other words, what we have is a general condition of identification or recoverability which requires an empty pronominal (PRO or pro) to be identified under appropriate circumstances, where identification can take different forms--if not by agreement then by an antecedent. Following essentially the formulation of Huang (1984), I assume that the identification requirement is to be expressed by the Generalized Control Rule (GCR) applying to both PRO and pro:

(136) The Generalized Control Rule:

An empty pronominal (PRO or pro) is coindexed with the closest potential antecedent. (Otherwise, an empty pronominal is assigned the index \(arb\) for arbitrary reference.)
The GCR is essentially a generalization of the rule of control proposed in Chomsky (1980), incorporating the 'Minimal Distance Principle' of Rosenbaum (1970) and applying it to both PRO and pro. In a clause with agreement markings, the agreement element (Agr) is the closest potential 'controller' (an Agr essentially amounts to an overt pronoun, with its markings for person, gender and number), so it must be the controller of its subject pro. A subject pro is licensed if the Agr is rich enough to be its 'controller', as in Italian-type languages. In a language like English, the mere appearance of Agr makes it the obligatory controller of its subject pro, but its degenerate nature makes it incapable of carrying out the task of control. Hence a pro is excluded in English.

On the other hand, a pro in Chinese, like a PRO in any language, does not have Agr occurring as its minimal potential 'controller', so it (like a PRO) can look outside the clause for its controller, and we have cases of control in the standard sense.

The idea that both pro and PRO are subject to the GCR receives important support from the fact that the Chinese pro exhibits control properties typically associated with the controlled PRO. For example, the Minimal Distance Principle (MDP) incorporated in (136) predicts that a PRO is controlled by an object when the matrix clause is transitive, and by a subject otherwise:

(137) John persuaded Bill₁ [PRO₁ to leave].
(138) John₁ tried [PRO₁ to leave].

Corresponding Chinese sentences with PRO clearly also exhibit MDP effects:

(139) Zhangsan bi Lisi₁ [PRO₁ mai nei-ben shu].
Zhangsan force Lisi buy that-CL book
Zhangsan forced Lisi to buy that book.
(140) Zhangsan₁ shefa [PRO₁ mai nei-ben shu].
Zhangsan try buy that-CL book
Zhangsan tried to buy that book.

More significantly, the pro occurring in resultative clauses also exhibits the same pattern
of control. Thus, in (141) it is Zhangsan who got tired, but in (142) it is the horse that got
tired:

(141)  Zhangsan _qi-de [pro_i hen lei].
       Zhangsan ride-till very tired
       Zhangsan rode until [he] got tired.

(142)  Zhangsan ba _ma_i _qi-de [pro_i hen lei].
       Zhangsan BA horse ride-till very tired
       Zhangsan rode the horse until [the horse] got tired.

(141) exhibits subject control, because the subject **Zhangsan** is the only NP c-
commanding pro. In (142), both a subject and an object occur in the matrix clause. If we
assume that the preverbal object marker **ba** is a Case marker whose presence does not
increase the depth of embedding in phrase structure, then the object **ma** 'horse' minimally
c-commands pro in (142) and the MDP, in turn, correctly predicts object control. The
following contrasts in acceptability may be explained in the same way:

(143)  a.  ta _chi-de [pro hen bao].
        he eat-till very full
        He ate until [he] was very full.

        b.  *ta ba _fan _chi-de [pro hen bao].
            he BA rice eat-till very full
            Lit. He ate the rice until [the rice] got very full.

(144)  a.  ta _he-de [pro _zui-xunxun-de].
        he drink-till very-drunk
        He drank until [he] was very drunk.

        b.  *ta ba jiu _he-de [pro _zui-xunxun-de].
            he BA wine drink-till very-drunk
            Lit. He drank the wine until [the wine] got very drunk.

The unacceptability of the (b) sentences clearly arises from a clash between their
intended meanings and the MDP. The resultative clause predicates meaning 'full' and 'drunk' denote properties that are only plausibly attributed to a eater or drinker, but the MDP forces them to be predicated of 'rice' and 'wine' respectively. Thus these sentences can only be accepted under such required, but absurd, interpretations.26

We have illustrated the GCR with sentences in which a PRO or pro is controlled. There are also cases of PRO and pro whose reference is arbitrary (or pragmatically inferred):

(145) It is unclear what PRO to do.

(146) John explained how PRO to behave oneself.

In Chinese, the reference of a pro can also be arbitrary:

(147) Zhangsan shuo [pro bu yinggai chi dao]. (spelling???)

Zhangsan say not should late arrive

Zhangsan said that one/we/you should not be late.

Whether a given PRO or pro is subject to control or not is determined by other structural conditions and possibly by the specific properties of individual lexical items. I shall not be concerned with the details of what these conditions are. The facts we have seen establish two points: First, Chinese but not English is a pro drop language; and second, reference of the Chinese pro may be determined by the theory of control, on a par with the reference of PRO, along the lines of the GCR.

I will now show that, the problems encountered in section 5.2 concerning the lack of island effects in Chinese topicalization and relativization can be solved in the following way. Assuming that the GCR may coindex an empty pronominal with either an antecedent in A-position or with one in A'-position, all the apparent island violations can be shown to arise from the independent possibility of having a pro that is properly coindexed with an A'-binder in accordance with the GCR in Chinese, i.e., from the possibility of using pro as a resumptive pronoun in this language. Since the GCR is subject only to the MDP but, unlike Move $\alpha$, not to Subjacency or other island
constraints, no real violation of these constraints has occurred.

5.3.3. How the Facts Follow

Consider now an example in which topicalization or relativization out of a complex NP is possible. In particular, consider the contrasts below again (repeated from (xxxx)-(xxxx)):

   Lisi sing song DE voice very good
   'Lisi, the voice with which [he] sings is very good.'

   b. *Lisi_i, [S wo hen xihuan [NP [S' [S e_i chang ge] de] shengyin]].
   Lisi I very like sing song DE voice
   *Lisi_i, I like the voice with which e_i sings.

(149) a. [S' [S [NP [S' [S e_i chang ge] de] shengyin] hen haoting] de]
   sing song DE voice very good DE
   nei-ge ren_i shi yi-ge yinyue laoshi.
   that-Cl person be one-CL music teacher
   The person_i who the voice with which [he] sings is good is a music teacher.

   b. *[S wo hen xihuan [NP [S' [S e_i chang ge] de] shengyin]] de
   I very like sing song DE voice DE
   nei-ge ren_i shi yi-ge yinyue laoshi.
   that-Cl person be one-CL music teacher
   *The person_i who I like the voice with which e_i sings is a music teacher.

In each case above, the binding relationship between the empty category [e] and its A'-binder cannot be established by Move α, since the process of movement involved would violate Subjacency. However, since Chinese allows pro drop, an empty category may be base-generated in the capacity of a governed pro whose reference is determined by the
generalized theory of control, in particular the GCR. Consider, then, the EC in each case as a pro. As an empty pronominal, the EC must be coindexed with the minimal NP c-commanding it or its reference is arbitrary. In (148a), the NP minimally c-commanding the EC is the topic, so by the GCR the EC is coindexed with the topic and we have a case of a topic properly A'-binding an EC within a complex NP. Since the GCR is subject only to the MDP but not to the principles of bounding, the binding relation does not violate any principle of grammar. The EC is admitted in (148a) not as a trace of movement, but as a pro—an empty resumptive pronoun.

Consider now (148b). Given Subjacency, the EC cannot be created as a trace by movement, but it can be base-generated as a pro. By the GCR, however, it cannot be coindexed with the topic. The closest NP c-commanding the EC is the subject NP wo 'I' of the comment clause, but not the topic Lisi. By the GCR the EC must be coindexed with wo or it would be assigned arbitrary reference. Since the EC cannot be related to the topic, either as a trace or as a pro, the sentence is ill-formed. More specifically, the sentence is only acceptable under the interpretation '(As for) Lisi, I like my own voice of singing' or '(As for) Lisi, I like the voice with which one sings'. Since no natural 'aboutness' relation exists between the topic and the comment, the sentence is ruled out.

The GCR thus correctly predicts that an element may be topicalized or relativized out of a complex NP if the complex NP occurs in subject position, but not if occurs in object position. It also correctly predicts the fact observed earlier that, if an object complex NP is preposed before the subject, extraction from the complex NP becomes possible. Thus in contrast with (148b), the sentence (150) (=xxxx) is well-formed, since the EC is now properly coindexed with the topic, the NP minimally c-commanding it, in accordance with the GCR:

\[
(150) \quad \text{Lisi, } [\text{NP } [S' [S e_i \text{ chang ge} \text{ de] shengyin}], [S \text{ wo hen xihuan}].}
\]

Lisi sing song DE voice I very like
Lisi, the voice with which [he] sings, I like.
The theory also accounts for the asymmetry we saw earlier with respect to the LBC (cf. (108) and (116) (????)):

(151)  
   a.  
   Zhangsan_i, [e_i baba]   hen  youqian.
   Zhangsan_i father very rich
   Zhangsan, [his] father is very rich.
   b.  
   *Zhangsan_i, wo hen  xihuan [e_i baba].
   Zhangsan I very like father
   c.  
   Zhangsan_i, [e_i baba] wo hen  xihuan.
   Zhangsan father I very like
   Zhangsan, [his] father, I like.

(151a) and (151c) are well-formed since in both cases the EC can be construed as a pro properly coindexed with the topic in accordance with the GCR, but (151b) is ill-formed because the required coindexing would violate the requirement of the MDP. Again, in (151b) the EC has to be interpreted as arbitrary or bound by 'I', and the sentence is out because in this case the comment 'I like my father (or fathers in general)' would hardly be a statement about the topic.27

Given what we have seen, it is not surprising that a subject of a sentential subject can be topicalized or relativized:

(152)  
   Lisi_i, [[e_i kan zhe-ben shu] zui     heshi].
   Lisi read this-CL book most  appropriate
   Lisi, that [he] reads this book is most appropriate.

(153)  
   [[e_i kan zhe-ben shu] zui heshi de] nei-gen ren ...
   read that-CL book most appropriate DE that-CL person
   The person such that for [him] to read the book is most appropriate.

Similarly, when a subject is extracted out of a clause-initial adjunct, the result is predictably well-formed:

(154)  
   Lisi_i, [[e_i yi hui dao jia],  dajia jiu jing-le   xialai].
Lisi once return to home all then calm-Perf down
Lisi, as soon as [he] got home, we all calmed down.

For the cases that we have illustrated, our account thus captures the generalization that certain syntactic islands fail to exhibit island effects when they appear in sentence-initial position. In each case, the structure involved is either (155a) or (155b), where $\alpha$ is a comment or relative clause and $\beta$ is an island:

(155)  

a. $\text{Topc}_i, [\alpha [\beta e_i \ldots] \ldots]$  
b. $[\alpha [\beta e_i \ldots] \ldots] \text{Head}_i$

In both structures, the EC occurs as the subject or most prominent argument of the island and is properly coindexed with a minimally c-commanding NP.

But it is possible to extract not only a subject but also an object out of a clause-initial island. The examples presented earlier in (104)-(106) and (110)-(112) (xxxx????) all involve the extraction of an object within an island. Two additional examples are given below. In (156), an object is topicalized out of a sentential subject, and in (157), an object is topicalized out of a relative clause:

(156)  

zhe-ge xiaohai, [[Lisi zhaogu e$_i$] zui heshi].

This child, that Lisi takes care of [him] is most appropriate.

(157)  

Zhangsan, [[e$_j$ piping e$_i$ de ren$_j$] hen duo].

Zhangsan, people who criticize [him] are many.

These sentences are not accounted for directly by the theory proposed so far. In (156), the NP minimally c-commanding the object $e_i$ is the EC’s own subject Lisi, not the topic zhe-ge xiaohai 'this child'. Similarly, in (157) the EC object $e_i$ of the relative clause is minimally c-commanded by its own subject, the relativized $e_j$. In both cases the $e_i$ cannot be admitted as a pro coindexed with the topic under the GCR. Given the theory of Bounding, the requisite coindexing also cannot be established under movement. The
well-formedness of sentences like (156)-(157) is not expected.

There is, however, a third way to obtain the required coindexing in these sentences. Assuming that movement is always an option when its operation is not ruled out by the principles of bounding or in some other way, the object EC in (156)-(157) may first be base-generated as a pro and moved to a topic or S-adjoined position within the sentential subject or relative clause—to the left of its subject—without crossing any island. Then, at S-Structure, this internal topic pro may be coindexed with the external topic in accordance with the GCR. In other words, the required coindexing between the external topic and the object EC is established, not directly by the GCR or by Move \( \alpha \) alone, but indirectly and jointly by the two processes. The relevant S-Structure representation of sentences like (156) and their relativized counterparts is then (158a) or (158b):

\[
(158) \quad \begin{align*}
(\text{a}) & \quad \text{Topic}_i, \quad [\alpha [\beta \text{pro}_i \ldots t_i] \ldots ] \\
& \quad \text{----- GCR ------ } \quad \text{M} \alpha \end{align*}
\]

\[
(\text{b}) \quad [\alpha [\beta \text{pro}_i \ldots t_i] \ldots ] \text{Head}_i \\
& \quad \text{----- M} \alpha \quad \text{-------------------------- GCR } \text{--------}
\]

There is independent evidence that an object may be internally topicalized within a sentential subject or a relative clause:29

\[
(159) \quad \text{Zhangsan, } [\text{nei-ge } \text{xiaohai}_i \text{ta } \text{bu } \text{xihuan } t_i \text{] mei guanxi}].
\]

Zhangsan that-CL child he not like not matter
Zhangsan, [that the child, he doesn't like] doesn't matter.

\[
(160) \quad [\text{nei-ben shu}_i \text{ta } \text{bu } \text{xihuan } t_i \text{de} ] \text{nei-ge } \text{ren } \text{lai-le}.
\]

that-CL book he not like DE that-CL person come-Perf
The person such that that book, he doesn't like has come.

Given the well-formedness of sentences like (159)-(160), there appears to be no reason to exclude (158a) and (158b) as possible structures. The possibility of topicalizing or relativizing an object out of a sentence-initial island is thus accounted for.

Jane Tang (personal communication) has observed that, in clear contrast to
sentences like (157), the following sentences are ill-formed:

(161) *Zhangsan, [[Lisi piping  e_i  de taidu]  hen  bu-hao].

Zhangsan  Lisi criticize  DE attitude very not-good

*Zhangsan, the attitude with which Lisi criticized is very bad.

(162) *Zhangsan, [[Lisi kanjian e_i  de difang] li  zheli hen  jin].

Zhangsan  Lisi see  DE place to here very near

*Zhangsan, the place where Lisi saw is very near here.

In (161) and (162), the head of the relativized construction corresponds to an adjunct in the relative clause, but in sentences like (157), an argument has been relativized. It seems that when an adjunct is relativized, no argument may be internally topicalized within the relative clause. So, (161) and (162) continue to be ill-formed even if Zhangsan occurs in a position internal to the relative clause (with no pause between it and Lisi). This point can be more clearly seen from the following contrasts:

(163) a.  wo bu  xihuan [Lisi piping  Zhangsan de taidu].
      I  not like  Lisi criticize  Zhangsan DE attitude
      I don't like the attitude with which Lisi criticized Zhangsan.

    b.  *wo bu  xihuan [Zhangsan, Lisi piping de taidu].
      I  not like  Zhangsan  Lisi criticize  DE attitude
      *I don't like the attitude with which Zhangsan, Lisi criticized.

(164) a.  wo zhidao [Lisi kanjian Zhangsan de difang].
      I  know  Lisi see  Zhangsan DE place
      I know the place where Lisi saw Zhangsan

    b.  *wo zhidao [Zhangsan, Lisi kanjian de difang].
      I  know  Zhangsan  Lisi see  DE place
      *I know the place where Zhangsan, Lisi saw.

This restriction does not hold when an argument is relativized. We have seen this to be the case in (160) where the relativized NP occurs in subject position. The same is true
when the relativized NP occurs as an object. The well-formed (165) provides a sharp contrast with (163b) and (164b):

(165) wo renshi [nei-ben shu, (ta) zui xihuan de nei-ge ren].
I know that-CL book he most like DE that-CL person
I know the person such that that book, he likes most.

The facts surrounding (161)-(165) thus provide strong support for the hypothesis that sentences like (157) are admitted with a structure like (158b), as a result of internal topicalization and the application of the GCR. As far as the current discussion is concerned, it is not important why internal topicalization is possible only when an argument is relativized. Whatever the explanation, our theory correctly predicts that when an object can be internally topicalized, it can also be topicalized externally, and that when internal topicalization is ruled out for some reason, so is external topicalization.

The idea that certain well-formed chain relations are established jointly by control and movement also correctly predicts that it is possible to topicalize out of an island that occurs as the subject of an embedded complement clause:

(166) Zhangsan, [wo zhidao [[xihuan e] de ren] hen duo]].
Zhangsan I know like DE person very many
Zhangsan, I know that people who like [him] are many.

We have independent evidence that a topic may be base-generated in an embedded A' position:

(167) Lisi zhidao [shuiguo, [wo zui xihuan juzi]].
Lisi know fruit I most like orange
Lisi knows that, (as for) fruists, I most oranges most.

Therefore, a sentence like (168) may be derived by base-generating shuiguo 'fruit' in embedded topic position (under S') and successive-cyclically moving it to the matrix topic position: 

(168) [S/shuiguoit, [S Lisi zhidao [S tj [S wo zui xihuan juzi]]]].
fruit       Lisi know       I   most like       orange
(As for) fruits, Lisi knows that I like oranges most.

Given this, there exists a possible derivation for sentences like (166). First, the topic **Zhangsan** is base-generated as a topic of the S' embedded under zhidao 'know', and the empty object in the relative clause is base-generated as a pro:

(169) \[
S'[S\text{ zhidao } [S' Zhangsan, [S [xihuan pro de ren] hen duo]]].
\]

I know Zhangsan like DE person very many
I know that Zhangsan, people who like [him] are many.

Move $\alpha$ may occur moving the embedded topic to the matrix S', leaving a trace. At the same time, the embedded pro may be internally topicalized in the relative clause, binding its own trace:

(170) \[
S'Zhangsan_i [S\text{ zhidao } [S' t_i [S [proj, xihuan t_j de ren]}
Zhangsan I know like DE person
hen duo]]].
\]

very many
At S-Structure, the GCR applies to coindex the pro with the embedded trace $t_i$, the NP minimally c-commanding it. (170) is well-formed just in case $i=j$ or all instances of $j$ are reindexed as $i$.

Before we conclude this section, there is one further fact that should be mentioned. Contrary to what is expected, the following sentence is acceptable:

(171) nei-ben shui, wo renshi [henduo kan-bu-dong e_i de ren].
that-CL book I know many can't-understand DE person
That book, I know many people who don't understand [it].

This sentence is structurally parallel to the unacceptable (172) below:

(172) *Zhangsan_i, wo renshi [henduo piping e_i de ren].
Zhangsan I know many criticize DE person
*Zhangsan, I know many people who criticize.
Although the contrast between (171) and (172) poses an apparent problem for the theory proposed, there is a highly plausible explanation for it. It is well known that in Chinese, personal pronouns denote animate NPs (most naturally humans) only. Thus, a human topic may be related to an overt pronoun or to an EC in (173), but an EC is required if the topic is inanimate as in (174):

(173) Zhangsan, wo hen xihuan (ta).
Zhangsan, I very like he
Zhangsan, I live (him) very much.

(174) nei-ben shu, wo kan-wan-le (*ta).
that-CL book I read-finish-Perf he

In other words, Chinese does not have an animate pronoun corresponding to it or the inanimate use of they. Now, it is also well known that in Chinese, as in many other languages, a sentence that would otherwise be excluded by Subjacency or other island constraints may be saved if a given offending EC is replaced by an overt resumptive pronoun. Thus, in contrast to (172), the following is perfectly acceptable:

(175) Zhangsan1, wo rensi [henduo piping ta1 de ren].
Zhangsan I know many criticize him DE person
Zhangsan, I know many people who criticize him.

However, the strategy of using an overt resumptive pronoun is unavailable when a given EC is inanimate, as in (171). Since it is precisely in this case that an otherwise ill-formed sentence is acceptable (in varying degrees), a natural explanation is that such sentences are admitted only as a 'last resort'. One way to put this idea to work is to say that the MDP requirement of the GCR may be waived in case a pro is inanimate or nonhuman. Whether or not this is the right explanation for (171), it is clear that its acceptability should not lead one to conclude that topicalization (or relativization) is completely free from the effects of Subjacency or the CNPC.
Summarizing, the questions raised at the end of section 5.2 can now be answered. Why should the generalization (118) obtain, that certain syntactic island cease to be islands in sentence-initial position and only in this position? The answer is that this is the only position where a given EC can be base-generated as a pro and properly coindexed in accordance with the GCR. Why should the generalization obtain in Chinese but not, say, in English? The answer is that Chinese, but not English, allows pro drop. Since Chinese is a pro drop language, a pro is available in certain cases where a trace is prohibited. In a non-pro-drop language, the strategy of using pro as a resumptive pronoun is not available at all.

5.4. Some Consequences

Our account of the bounding facts in Chinese thus takes the view that Bounding Theory applies in Chinese as in other languages, and that apparent violations arise when an EC is admitted as a pro rather than as a trace.

Our account, if correct, has a number of theoretical consequences. One of them has to do with whether or not movement may be involved in topicalization and relativization in Chinese. We have seen that certain topic structures do not involve a gap, so it is already clear that not all cases of topicalization need involve movement. Our account of the apparent island violations also makes it clear that many acceptable cases of topicalization and relativization are derived via deletion or pro drop and not by movement. What about cases that do not show any apparent island violation? Given that some ECs must be derived from pro drop, it is tempting to conclude that no movement is involved in any grammatical topicalized or relativized structure (as Li and Thompson (1976), Xu and Langendeon (1985) and others have claimed). This conclusion is, of course, not logically necessary. Furthermore, it is neither conceptually nor empirically supported. In cases where an EC may be created via Move α without violating any island constraint, the optimal hypothesis is the null hypothesis, i.e., that...
movement may (or may not) be involved. The burden of proof thus lies with proponents of the no-movement hypothesis. In fact, given our account, there is also positive evidence for the existence of movement in some structures. We have seen that certain ECs cannot be directly admitted as pro's in the object position of a syntactic island since the GCR would not be able to coindex it with an element outside the island. Such ECs must first be moved to an internal topic position before it can be properly coindexed under the GCR. In other words, certain structures involve both pro drop and movement. The obligatory existence of movement can also be concluded from simple examples of topicalization like (176)-(178) below:

(176)  Zhangsan, Lisi kanjian-le ei.
       Zhangsan   Lisi see-Perf
       Zhangsan, Lisi saw.

(177)  Zhangsan, Lisi zhidao wo kanjian-le ei.
       Zhangsan   Lisi know   I   see-Perf
       Zhangsan, Lisi knows that I saw.

(178)  Zhangsan, Lisi zhidao wo shuo ta kanjian-le ei.
       Zhangsan   Lisi know   I   say   he see-Perf
       Zhangsan, Lisi knows that I said that he saw.

Recall that, in order to account for the restricted nature of apparent island violations (that they occur only in clause-initial position), the GCR must be constrained by the MDP, a requirement that also accounts for other familiar effects that typify standard cases of obligatory control. In each of (176)-(178), the EC cannot be a pro at S-Structure, since it is not coindexed with its own subject, the NP minimally c-commanding it. The only remaining possibility is for it to be a trace. This possibility is allowed, of course, because the trace can be created by movement (successive-cyclic movement in (177)-(178)) in full accordance with principles of bounding.

That certain ECs must be created by movement is also evidenced by the fact that
certain VP idioms may have their objects topicalized:

(179) xin, wo daoshi bu dan e.

heart I nevertheless not carry

Worried, I nevertheless am not.

The verb-object construction dan xin 'carry heart' has the idiomatic meaning of 'worry'. The object xin, literally 'heart', is an idiom chunk that does not have its literal meaning and is completely non-referential. Since it is non-referential, it cannot enter into a relation of coreferentiality with another element. Therefore, the relationship of xin to the object EC cannot be established any rule of coreference such as the GCR, and must be established by movement.

Given the conclusion that Move α may be involved in Chinese topicalization and relativization, we can now say that there is also evidence for Subjacency and other island constraints from Chinese. The relevant evidence comes from the fact that, except for clause-initial islands, no extraction out of an island is possible. We have seen that such extraction is not licensed by the GCR. But if the island constraints did not obtain in Chinese, then there would be no reason why such extraction could not be sanctioned under movement. This conclusion is, of course, not surprising. It would be surprising, indeed, if Chinese were to exhibit true freedom from the constraints of such abstract principles of grammar.

Our account thus constitutes an argument for the modular view of grammar. Previous studies of Chinese topicalization and relativization have considered all ECs observed in such constructions to be of the same kind. Scholars have differed as to whether such ECs are derived via movement (as traces) or by deletion (or base-generated as pro's), but the opinion is either that they are all traces or that they are all pro's. Such a phenomenal view entails unmotivated complications of the principles of control or bounding and fails to capture significant cross-linguistic generalizations in an insightful way. Our account shows that it is necessary to construe some instances of the EC as pro's
and others as traces. Pro's are subject to (generalized) control but not to bounding, whereas traces are subject to bounding but not to control. On the surface, Chinese and English differ radically in their properties of topicalization and relativization, but under the modular view the complexities reduce to very general principles of UG and the parameters associated with them.

A theoretical issue that concerns the proposed account is whether the bounding and control principles are to be construed as conditions on derivation (on the application of Move $\alpha$ and the GCR) or as conditions on representation (on the output of these rules). The answer depends, in part, on how an EC is defined, in particular whether the EC is functionally defined as in (8) (xxxx) in the beginning of this chapter (from Chomsky (1982)), or intrinsically defined as in (7) (xxxx) in terms of the features $[\alpha$ anaphor, $\beta$ pronominal]. According to the functional definition, an EC that is locally A'-bound at any given level of representation is defined as a variable. Under this definition, all instances of the relativized or topicalized EC are variables at S-Structure or as soon as the ECs are coindexed with their respective A'-binders, whether the indices have been assigned by the GCR or under Move $\alpha$. Clearly, if the bounding conditions and the MDP requirement of control were construed as conditions on representation, then certain admissible ECs would be wrongly excluded. Therefore, under the functional definition of the EC, the MDP and the bounding principles must be construed as conditions on rule application.

On the other hand, it may be that empty categories should be defined intrinsically as in Chomsky (1981, 1986, etc.), and not functionally. Under the intrinsic definition, an EC is defined in terms of the features $[\alpha$ anaphor, $\beta$ pronominal] at D-Structure, and retains its features throughout a derivation. An EC that is indexed by the GCR will always be a pronominal, and an EC that is indexed under movement will always be a trace. Under this view, it is possible (though not necessary) to construe the bounding principles and the MDP as conditions on output representations. That is, Subjacency and other...
Bounding conditions may be defined as holding of antecedent-trace relations and the MDP as holding of antecedent-PRO/pro relations alone.

Since a resolution of this interesting issue is not available at this time, I shall leave it for future research.

1 It is a well known property of English and many other languages that all clauses must have a subject whether or not the subject position bears a thematic role related to the verb. This requirement accounts for the obligatory existence of expletives like it, there in English. On the other hand, many other languages do not exhibit overt expletive elements like English it, there. It may be debatable whether the expletives do exist in such languages (though in abstract form) or they simply don't.

2 We shall return to the notion of government in Section 5.3. For the moment, the subject position of an infinitival clause is ungoverned, and all other positions are governed.

3 The ban against extraction from an adverbial adjunct has been made in Cattell (1976). The term Adjunct Condition is taken from Chomsky (1986).

4 Rizzi (1982) argues that S' but not S is a bounding node in Italian. This accounts for the fact that, in Italian, extraction out of one wh-island is allowed, but not out of a complex NP or more than one wh-island. A similar proposal is made in Sportiche (1981) and Torrego (1982) for French and Spanish.

5 Only one of the two positions may be lexically filled at the level of PF. This requirement, yet to be explained in some manner, seems to be a property of some languages (like modern English) only, but does not apply to others (e.g., Middle English).

6 In the grammatical sentence (i) (= (11a)) below, movement has also apparently crossed two bounding nodes:

   (i) \[S'\ Who_i [S do you like [NP pictures of t_i]]?\]

Chomsky (1977) argues that such sentences are derived by first vacuously extraposing the PP of who out of the NP and then moving who into COMP. In each step, only one bounding node is crossed. Vacuous PP extraposition cannot take place from subject position to save (26), however, since PP cannot occur in preverbal position in English.

7 It may be that (29b) is independently ruled out by the Case Filter, under the standard assumption that the passive verb is incapable of Case-marking the postverbal NP containing pictures. It is possible then that the LBC may be partly reduced to Subjacency and partly to the Case Filter. In chapter 6, we observe (ASSUME/ ARGUE?), following Kayne (1983), that the LBC should be subsumed under the ECP. At any rate, it is clear that not all LBC violations are reducible to Subjacency.

8 The element bei may exist solely in the capacity of a passive particle marking a sentence as a passive, dethematizing its subject and absorbing Case, but not as a preposition taking an agent argument:

   (i) Zhangsan bei kanjian-le.
Zhangsan by see-Perf
Zhangsan was seen.

That the bare beh in (i) is a passive particle but not a preposition is supported by two independent facts. First, Chinese is a language that does not in general allow preposition stranding:

(ii) *nei-ben shu, Zhangsan ba t kanwan-le.
that-CL book Zhangsan BA read-finish-Perf
That book, Zhangsan finished reading [it].

Secondly, in a sentence with a bare beh like (i), there is no referential agent implied. A true missing argument in Chinese usually has a definite reference, as indicated below:

(iii) Lisi kanjian-le [e].
Lisi see-Perf
Lisi saw [it/him/her . . .].

Such a missing argument can take a topic as its antecedent:

(iv) Zhangsan, Lisi kanjian-le [e].
Zhangsan Lisi see [him].

However, a passive sentence with a bare beh cannot be predicated of a topic as its implicit agent:

(v) *Zhangsan, Lisi bei kanjian-le.
Zhangsan Lisi be see-Perf
*Zhangsan, Lisi was seen.

If beh in (v) is treated as an exceptional preposition that can be stranded, then it is not clear why the trace following beh cannot be bound by Zhangsan. On the other hand, if beh is treated as a particle (or intransitive preposition) that is not followed by an implicit agent argument, (v) can be correctly ruled out as odd (on a par with its English translation) for the reason that the comment clause says nothing about the topic.

I assume, following Larson (1988), that when there are more than one internal arguments in VP, the arrangement of these arguments is governed by a principle of argument realization defined on the basis of the hierarchy Agent > Theme > Goal > Oblique, such that if q1 > q2, then the argument to which q1 is assigned must c-command the argument to which q2 is assigned. Thus, if VP contains two objects, the external object (often associated with the Theme role) must be placed higher in the tree—as Spec of VP—than the internal object (often associated with Goal, Range, and other Oblique roles). But if the VP has only one internal argument, it makes little difference where in VP this argument is placed. This remark does not apply when arguments that are external to VPs, i.e., Williams' (1982) external arguments, are considered. Given recent arguments for the unaccusative hypothesis (Perlmutter (1978), Burzio (1986), etc.), it is clear that, although arrive and cry each take only one argument, the single argument of the former is an argument internal to VP at D-Structure, whereas the single argument of the latter must be represented as an argument external to VP (as subject of S). In the cases involving complex predicates, both the external and the internal objects are internal in Williams' sense, as they are both represented in positions internal to VP. In cases where only one object is involved, I know of no arguments that require the object to occur only under V' or only as [Spec, VP].

In traditional terms, a question arises as to whether the process involved is a raising
transformation or a process of passivization. But under the modular view of grammar, the question disappears, since all the putative transformations are simply descriptive names for certain instances of Move a.

11 Examples like the following have been cited as topic structures without a chain (Tsao (1977), Tang (1979), etc.):

(i) Zhongguo, difang hen da.
   China land-area very large
   China, the land area is large.

(ii) tamen, wo kan ni, ni kan wo.
    they I look-at you, you look-at I
    'They looked at each other.'

These examples, however, do have relativized counterparts:

(iii) difang hen da de guojia dou hen qiang.
     land-area very large DE country all very strong
     Countries whose land area is large are all very strong.

(iv) wo kan ni, ni kan wo de neixie ren dou shi shagua.
     I look-at you you look-at I DE those person all be fool
     The people who were looking at each other are all fools.

I claim, however, that all these examples involve chains. In (i), the topic holds a chain relation with an empty possessive position in the NP difang 'land area', and in (iii) the possessive argument is relativized. In (ii) and (iv), the expression literally meaning 'I look at you, you look at me' is an expression meaning 'to look at each other' that should be analyzed as an idiomatic predicate (dominated by VP, cf. Teng (1974)). In both (ii) and (iv), there is an empty subject position preceding the idiomatic predicate, and this empty subject forms a chain with the topic or the head.

12 An adjunct PP may occur in clause-initial position:

(i) yong zhe-zhong shengyin, ni keneng chang-bu-hao.
    with this-kind voice you possible sing-not-goo
    With this kind of voice, you probably won't sing well.

(ii) zai jiali, Zhangsan chang dashang ma ren.
    at home Zhangsan often loud scold person
    At home, Zhangsan often yelled at people.

Li and Thompson (1981) consider every sentence-initial phrase to be a topic. But it is also possible to consider the clause-initial adjuncts here as preposed adverbial phrases and not as topics. At any rate the relevant contrast is that an NP that is related to a clause as an adjunct can head a relative clause, but such an NP cannot be a topic.

13 The binding principles are principles of A-binding, i.e., binding by an antecedent in A-position, so in (\$70) 'bound' means 'A-bound' and 'free' means 'A-free'. Principle A (\$70a) requires an anaphor to be A-bound in a local domain (its governing category), Principle B requires a pronominal not to be A-bound in a local domain, whereas Principle C requires an R-expression not to be A-bound at all. For the notion of a governing category, I shall assume the definition proposed in Huang (1983), where more details are given:

(i) a is the governing category for b iff a is the minimal category containing b, a governor of b, and a SUBJECT which, if b an anaphor, is accessible to
Following Chomsky (1981), a SUBJECT include the Agr element where it appears, or the ordinary subject (of a sentence or NP). a is accessible to b iff a c-commands b and coindexing a and b would not result in an 'i-within-i' configuration. Roughly speaking, the governing category for b is the minimal category NP or S in which the relevant principle can be satisfied. In the case of an anaphor, the governing category is often the minimal NP or S that contains a potential antecedent for the anaphor. Cf. Chomsky (1986) for a modification of (i), in terms of the notion of a 'Complete Function Complex' (CFC).

14 R-expressions are those NPs that are [-anaphor, -pronominal]. According to the definition given in (xxxx), this category includes wh-traces (variables) and all lexical categories that are neither anaphoric nor pronominal.

15 The ill-formedness of ($75a) cannot be attributed to a violation of the 'aboutness requirement'. In talking about an extremely boring book, the following sentence, where the topic does not contain the anaphor ziji, is well-formed:

(i) nei-ben shu, Zhangsan dou shui-zhao-le.
that-CL book Zhangsan even fall-asleep-Perf
(As for) that book, even Zhangsan fell asleep.

16 See Belletti and Rizzi (1988) for the treatment of Principle A as an 'anywhere' principle, i.e., the idea that Principle A may be satisfied at any point no later than S-Structure.

17 This is the notion of 'chain-binding' proposed in Barss (1986), where a number of other 'reconstruction' phenomena are accounted for.

18 Raising is optional at each step. So in addition to ($78*a) and ($78*b), the following are also well-formed:

(i) yinggai ta shi keneng hui lai.
should he be possible will come
It should be that he is likely to come.

(ii) yinggai shi ta keneng hui lai.
should be he possible will come
It should be him who is likely to come.

19 The bare reflexive ziji (though not the compound reflexives taziji 'himself', woziji 'myself', etc.) may allow long-distance binding under certain conditions. In particular, ziji may have a long distance antecedent (in apparent violation of Principle A) if all intervening potential antecedents agree with the long-distance antecedent in person and number. Compare ($84*c) in the text with (i) below:

(i) Zhangsan zhidao [Lisi chang piping ziji].

This and other related facts were first discovered by Y.-H. Huang (1984) and were extensively discussed in Tang (1989). For recent arguments that the observed long-distance binding should be treated as involving multiple steps of local binding in accordance with Principle A, see Battistella (1987), Cole et al (1989) and Huang and Tang (1989).

20 Chomsky (1981) has suggested that cases involving 'super-raising' are ruled out by Subjacency:
(i) *John seems that it is likely \([t\; to\; win]\).

However, since Chinese has neither overt expletive pronoun nor overt tense marking, the Chinese counterpart of (i) looks no different from the Chinese counterpart of the grammatical (ii):

(ii) John seems \([e\ to\ be\ likely\ [e\ to\ win]\].

For this reason, no Chinese counterpart of (i) can be used to provide evidence for Subjacency.

21 Chinese does not seem to have true NP complement clauses corresponding to the belief that \(S\), the realization that \(S\), etc. in English. Therefore, the complex NPs are instantiated by NPs containing relative clauses (as in \((87*a)\) and \((88*a)\)) or appositive clauses (as in \((91*a)\)) only.

22 In English, WIC violations under topicalization and relativization seem to produce results that are not as severely ill-formed as WIC violations in wh-questions. The Chinese topicalized and relativized examples being considered still differ qualitatively from their English counterparts, however. The Chinese examples are, as far as I can determine, completely natural.

23 Cases with apparent 'unbounded passivization' like \((129)\) have been reported in Huang (1974). For a similar observation about \((127)-(128)\) and their analysis, see M. Li (1985), A. Li (1988).

24 The appearance of empty pronouns is in fact much more widespread. Not only finite clause subjects but also objects may be missing from grammatical sentences. Thus, in a natural discourse situation, a question like (i) can be answered with any of (ii) with either the subject or the object or both missing:

(i) Zhangsan kanjian-le Lisi le ma?
    Zhangsan see-Perf Lisi Asp Q
    Did Zhangsan see Lisi?

(ii) a. ta kanjian-le ta le.
    he see-Perf he Asp
    He saw him.

b. ta kanjian-le \([e]\).
    He saw \([him]\).

c. \([e]\) kanjian-le ta le.
    \([He]\) saw him.

d. \([e]\) kanjian-le \([e]\).
    \([He]\) saw \([him]\).

If these empty pronouns are all considered instances of pro, then there is even strong evidence for the claim that Chinese is a pro drop language. However, in Huang (1984) I argued that the empty pronouns in these cases, especially those occurring in object position, are not pro's, but variables that are each A'-bound by an operator which is itself null. This hypothesis receives considerable support from languages like Portuguese, German, Swedish and even ASL and from independent work by other writers (e.g., Raposo (1984), Campos (1986), Lillo-Martin (1986), Hasegawa (1984)), but has also met with some disagreements. For extensive discussion see Huang (1984, 1987), Xu (1986), Cole (1987), Chung (1984), and the many papers collected in the Proceedings of the 2nd Harbin Conference on Generative Grammar (Xiaoguang Li, ed. (1989) and Ning, ed.
For a somewhat different formulation of the rule, see Huang (1989). In this work I also suggest that it is possible to collapse PRO and pro into one single category, the pure pronominal pro. A more explicit proposal to the same effect is made in Borer (1989).

For other attempts to derive the pro drop parameter, see the discussion of Jaeggli and Safir (1989) and the references cited there.

There is an apparent counterexample to the claim that the interpretation of Chinese resultative constructions follows from the MDP. The following sentences each contain a matrix object but the resultative clause is uniquely controlled by the matrix subject:

(i) Zhangsan qì ma qi-de [pro hén leǐ].
    Zhangsan ride horse ride-till very tired
    'Zhangsan rode the horse until [he] got very tired.'

Notice, however, that in (i) there are two instances of the verb qì 'ride'. Given the discussion in Chapter 2 (see pp. xxxx), there is good reason to consider the second occurrence of qì to be the main verb of the sentence, and the first occurrence to be part of a deverbalized adjunct. That is, the structure of (i) is something like (ii):

(ii) S
    NP
    Adjunct VP
    V1 NP V2 Result
    ta qì ma qi-de pro hén leǐ
    he ride horse ride-DE very tired

In this structure, the object ma 'horse' does not c-command pro. Therefore, the NP minimally c-commanding the pro is the subject. The fact that subject control is required in (i) is thus completely consistent with the MDP.

In contrast to ($151b), the following is well-formed:

(i) jùzi, wo buo-le [pro pi] le.
    orange I peel-Perf skin ASP
    The orange, I peeled [its] skin.

According to the GCR, the pro in (i) cannot be directly coindexed with the topic. However, there is good reason to suppose that the sequence buo-le pi 'peeled the skin of' is a transitive complex predicate corresponding in meaning to the simple verb peel in English. There is an object position external to the complex predicate which actually controls the pro subject of pi 'skin'. In other words, the structure of (i) is (ii), where pro is coindexed with ti in accordance with the GCR:

(ii) jùzi, wo [VP ti [V' buo-le [pro pi]]] le.
    orange I peel-Perf skin ASP

Why is a similar analysis not available that would rule ($151b) in? The answer is a semantic one. An event like 'seeing X's father' can hardly be an event that affects X, so the sequence kanjian baba cannot be analyzed as a transitive complex predicate that theta-marks an external object. It seems that a necessary condition for the formation of a transitive complex predicate is that it denotes an action that is 'transitive par excellence', i.e. that it readily takes a patient or affected theme as its object. Thus, although it is
unnatural to talk about 'father-seeing' someone, it is possible to talk about 'skin-removing' an orange or 'father-kiling' someone:

(iii) Zhangsan, Lisi da-si-le pro baba le.
     Zhangsan Lisi kill-perf father ASP
     Zhangsan, Lisi kill [his] father.

28 In fact, ($157) is ambiguous between the two readings (a) 'Zhangsan, the people who criticize him are many', according to which the subject of 'criticize' is relativized and its object topicalized; and (b) 'Zhangsan, the people who he criticizes are many', according to which the subject is topicalized and the object relativized. We are currently interested only in the first reading.

29 Earlier in section (xxxx) it was argued that, contrary to Kuno's (1976) and Tang's (1979) claim, relativization may take place independently of whether a given argument may be topicalized within the relative clause. The claim being made now is that internal topicalization is in general possible as an option, but this option is required in cases represented by ($158b) in order to establish the coindexing relation between $t_i$ and the head. The option is forced, not by Kuno's Thematic Constraint, but by the MDP requirement of the GCR.

30 For simplicity of presentation, I shall assume that topics are dominated by S'. Alternatively, one may assume with Chomsky (1977) that matrix topics are base-generated under S", and that an abstract operator moves from below into the highest COMP position and gets coindexed with the topic under the rule of predication. According to this view, the proper representation of ($168) would be:

(i) \[S'' \text{shuiguo} [S' \text{OP} [S \text{Lisi zhidao} [S' \text{t} [S \text{wo zui xihuan juzi}]])].

31 Actually, to many speakers the sentence is only marginally acceptable. My informants often showed the tendency to correct me with the following, where the relative clause appears in sentence-final position:

(i) nei-ben shu, wo renshi hendo ren [kan-bu-dong ei].
     That book, I know many person can't understand
     That book, I know many people who don't understand [it].

Recall from the discussion in (2.xxxx) that the bracketed clause in (i) is not a postnominal relative clause but a postverbal secondary predicate that is related to the object 'many people' but does not form a complex NP with the latter. Therefore, the [topic, e] chain in (i) does not cross any island.

Sentences like ($171) were reported in an informal document that I circulated to Chomsky, Xu, and others in the fall of 1982. Xu (1986) and Xu and Langendoen (1985) used them to illustrate their claim that Chinese topicalization is completely free from the effects of Subjacency.

32 Alternatively, one might assume that Chinese does have a full paradigm of personal pronouns, but that inanimate pronouns are phonetically null. Of course, such phonetically null inanimate pronouns are to be understood as 'overt' in a sense that the true empty pronominal, pro, is not. That is, the inanimate pronoun can save an island violation in environments where the truly empty pro cannot. The inanimate pronoun is on a par with overt pronouns in not being subject to the GCR.
One possible argument for the functional view is that it provides a highly plausible answer to a question unraised above. This has to do with the fact, observed by Ken Safir (personal communication), that although the little pro can serve as an empty resumptive pronoun in some languages (as I have claimed happens in Chinese), no language seems to allow the use of the ungoverned PRO for the same purpose. Thus, the sentences below are ill-formed despite the fact that the PRO is properly coindexed in accordance with the GCR:

(i) *John\textsubscript{i}, [[PRO\textsubscript{i} to behave in public] is important].
(ii) *John\textsubscript{i}, [[PRO\textsubscript{i} smoking] is harmful].

The question is why. Consider the functional definition of the EC. In (i) and (ii), since PRO is locally A'-bound, it is functionally defined as a variable once the GCR has applied, and not as a pronominal. As a non-pronominal, the variable is subject to the Empty Category Principle (ECP), which requires it to be properly governed. But a variable that is derived from an unogoverned PRO is ungoverned. Hence the requisite coindexing is ruled out by the ECP. We have, then, a straightforward answer to the question why only pro, but not PRO, can function as a resumptive pronoun.

There are, however, also problems associated with the functional view. For some relevant discussions, see Brody (1984) and Chomsky (1986). I shall leave the question opened.