11 Ellipsis

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1 Introduction

It is well-known that Chinese seems to allow “deletion” or “ellipsis” prominently – constituents that are inaudible or invisible but are still meaningful. For instance, the following sentence does not have an overt subject or object but they must be included in the interpretation of the sentence (somebody saw something):

(1) __ kandao __ le.
   see LE
   “___ saw ___.”

Not only can subjects and objects be missing, so can predicates. The interpretation of the if clause in the sentence below must include a VP following the modal “will”:

(2) ruguo ta hui __, wo ye jiu yiding hui ba
    if he will I also then certainly will BA
    shu kan-wan.
    book read-finish
    “If he will ___ then I will definitely also finish reading the book.”

Even a clause seems to be able to disappear, such as the missing “he does not study any more” in the complement clause after “why” in (3) below.

(3) ta bu nian shu le; wo xiang-zhidao (shi) weishenme __.
    he not read book LE I want-know be why
    “He does not study any more; I want to know why ___.”

The commonly used terms to refer to the types of missing elements in (1)–(3) are argument ellipsis, VP-ellipsis, and sluicing (IP ellipsis) respectively, which
represent the major types of elliptical structures in natural languages. The main questions that have been attracting linguists’ attention are:

(4) a. The licensing condition: what licenses elements to be missing? Are both syntactic and semantic licensing conditions required?
   b. The syntactic structure: how are missing elements represented syntactically? Are they fully represented and then deleted at some point – deletion in syntax or at PF? Or are the missing elements empty from the beginning of derivation – base-generated as empty?
   c. The representation at Logical Form (LF): how are the missing elements properly interpreted?

Numerous proposals have been made to address these issues. Winkler and Schwabe (2003) provided an up-to-date summary and comparison of the main approaches to ellipsis: whether deletion actually applies, when deletion takes place, and how missing elements are interpreted. Since 2003, there have been many more influential works that have brought forward significant empirical generalizations, continued refining the previous analyses, and have broken new ground toward better understandings of the properties of the missing elements (see, among many others, Everaert and van Riemsdijk 2005; Merchant 2005; Johnson 2008; van Craenenbroeck 2009; Baltin 2012). The challenge is that there is still no consensus on a unified approach to all the elliptical structures across languages. A major controversy has been on the “timing” of deletion: is deletion a very late phenomenon in the sense that it is simply a failure to spell out certain constituents – PF deletion (represented by Merchant 2001)? Or is it deletion in syntax, which can affect syntactic operations and interpretive possibilities in the relevant domain (phase) (Baltin 2012)? Or is it even earlier, the missing element is truly empty syntactically, requiring LF copying for interpretation (e.g., the interpretive approach summarized in Winkler and Schwabe 2003; Oku 1998; Saito 2004, 2007; Li 2005, 2007, to appear)?

Chinese has an abundance of elliptical structures, which can help shed light on the debate. Unfortunately, the richness of the relevant data and the required explanations make it impossible to discuss in comprehensible detail within the limited space how the numerous empirical generalizations can or cannot be captured by the various approaches, especially when different analyses may involve contrasting assumptions and theoretical mechanisms. Accordingly, this chapter simply focuses on the important properties of the more commonly recognized elliptical structures in Chinese and some promising analyses, without comparing alternatives. The constructions discussed will be NP/DP ellipsis (Section 2), VP-ellipsis (Section 3), and sluicing (Section 4).

2 DP/NP ellipsis

This section will include the so-called argument drop structures, conveniently referred to as “DP-ellipsis” in Section 2.1, and, in Section 2.2 “NP-ellipsis”
constructions – sub-parts of an argument being missing (termed as N’-ellipsis if an argument nominal phrase is represented as an NP, instead of a DP).

2.1 **DP-ellipsis**

Chinese prominently allows arguments to be missing. For instance, the subject of the sentence in (5) and the object of the second clause in (6) can be missing.

(5) (ta) zou-le ma?
   he leave-LE Q
   “Has (he) left?”

(6) ta kandao-le yi-ge nanhai; wo ye kandao-le
    he see-LE one-CL boy I also see-LE
    (yi-ge nanhai).
    one-CL boy
    “He saw a boy; I also saw (a boy).”

What are such null arguments? One possibility is a variable analysis, as Huang (1982, 1984) proposed for some empty arguments in Chinese – a language that productively topicalizes arguments and in which the topic phrase can be null. For instance, a sentence like (7) is possible when the intended object of the verb is clear from the discourse. The object is expressed as a variable bound by a topic, which can be empty:

(7) (tamen), wo hen xihuan ___.
   they I very like
   “(Them), I like ___”

However, the variable option cannot apply to all the missing arguments in Chinese because an object that cannot be topicalized can still appear in the null form. The cases that are not topicalizable are (i) when the relevant nominal is indefinite, because a topic must be definite (e.g., Chao 1968; Li and Thompson 1981, among many others), and (ii) when islands are involved, because topicalization is restricted by island conditions (Huang 1982 and Li 1990 for instance). Notably, missing objects can be indefinite and they can occur within islands co-indexed with their antecedents across island boundaries. These are illustrated below.

Missing objects interpreted as indefinite expressions:

(8) a. ta song yi-ge nanhai yi-ben shu; wo song
    he give one-CL boy one-CL book I give
    yi-ge nuhai (yi-ben shu).
    one-CL girl one-CL book
    “He gave a boy a book; I gave a girl (a book).”

   En
b. ta song yi-ge nanhai yi-ben shu; wo song he give one-cl boy one-cl book I give
(yi-ge nanhai) yi-zhi bi.
one-cl boy one-cl pen
“He gave a boy a book; I gave (a boy) a pen.”

Missing objects insensitive to island conditions:

(9) zhe-ge laoshi hen hao wo mei this-cl teacher very good I not kandao-guo [[ e] bu xihuan e de] xuesheng_{e} see-exp not like de student
“This teacher_{2} is very good. I have not seen students_{1} who e_{1} do not like (him_{2}).”

The acceptability of the sentences in (8a–b) is important in another respect – it shows that either of the two objects in double object constructions can be missing. The following examples involving islands illustrate the same point.

(10) wo [yinwei Zhangsan gei/fa yi-ge xuesheng liang-ben I because Zhangsan give/fine one-cl student two-cl shu] hen gaoxing;
book very happy
keshi [yinwei Lisi zhi gei/fa yi-ben shu] wo but because Lisi only give/fine one-cl book I
bu gaoxing.
not happy
“I was happy because Zhangsan gave/fined a student two books; but I was not happy because Lisi only gave/fined (a student) a book.”

(11) wo [yinwei Zhangsan gei/fa yi-ge nan xuesheng yi-ben I because Zhangsan give/fine one-cl male student one-cl shu] hen gaoxing;
book very happy
keshi [yinwei Lisi zhi gei/fa yi-ge nu xuesheng] but because Lisi only give/fine one-cl female student
wo bu gaoxing.
I not happy
“I was happy because Zhangsan gave/fined a male student a book, but I was not happy because Lisi only gave/fined a female student (a book).”

The possibility of either of the two objects being empty in double-object constructions suggests that such missing arguments cannot be the result of VP-ellipsis applying to some projection of V – a verb is raised out of its base-generated
position, creating a VP containing the trace of the raised verb and an argument; then deletion applies to this verb phrase, stranding the raised verb \([V_1 \ldots [\ldots \text{Object}]]\) (see, among others, Huang 1991; G. Li 2002; Otani and Whitman 1991; and Goldberg 2005 for stranded V constructions derived by VP-ellipsis). Consider the acceptability of (8b) or (11). As in many other languages, the first object in the double object construction \([V \text{Object1 Object2}]\) asymmetrically c-commands the second object in Chinese (Barss and Lasnik 1986; Larson 1988; Aoun and Li 1989, 1993, among others). The asymmetric c-commanding relation can be demonstrated by scope and binding properties:

(12) The first object necessarily has scope over the second object

a. \(\text{wo gei mei-ge ta yao de ren yi-ben shu.}\)
I give every-cl he want de person one-cl book
\(- \forall > \exists \)
“I gave everyone he wants a book.”

b. \(\text{wo gei yi-ge ren mei-ben ta mai de shu.} \quad \exists > \forall \)
I give one-cl person every-cl he buy de book
“I gave a person every book that he bought.”

(13) The first object asymmetrically c-commands the second object regarding Binding

a. \(\text{ni yao song na-ge ren, taziji, de zhaopian?}\)
you want give which-cl person himself de picture
“Which person(\(x)\), you want to give \(x\) pictures of himself?”

b. \(\text{*wo yao song ta = Lisi de zhaopian.}\)
I want give him Lisi de picture
“*I want to give him, Lisi’s pictures.”

Accordingly, the first object must be in a higher position than the second object structurally: \([V [\text{Object1} \ldots \text{Object2}]]\). Then, it is impossible to have a constituent containing only the verb and the first object, to be deleted by some VP-ellipsis operation, leaving behind the verb and the second object, as in (10).

The patterns above show that the relevant missing arguments cannot be variables bound by empty topics or derived by VP-ellipsis.\(^3\) In the following section, we will show that subject and object empty categories should be analyzed differently: an empty subject is a \textit{pro} governed by the identification procedure in Huang’s (1982) Generalized Control Rule. In contrast, an empty object cannot be a \textit{pro}, nor any of the other recognizable empty categories. It is a truly empty element syntactically and is interpreted after copying at LF of the materials in the discourse (cf. late insertion as in Oku 1998, or LF copying approach to argument ellipsis in Kim 1999; Saito 2004, 2007; Shinohara 2006, among others).\(^4\)

2.1.1 Subject/object asymmetry Let us begin with a very interesting asymmetry in interpreting empty subjects and empty objects, as discussed in Li (2005, 2007)
and Aoun and Li (2008). Specifically, when a null argument is to be anteceded by a nominal across island boundaries, the antecedent for an empty subject must be the closest nominal, but the requirement does not apply to empty objects.

(14) Zhangsan₁ hen heshan, wo zhao-bu-dao yi-ge [[ e bu xihuan Zhangsan very friendly I seek-not-find one-cl. not like e de] ren₂].
  de person
  a. “Zhangsan₁ is very friendly. I cannot find a person₂ that e₂ does not like (him₁).”
  b. “Zhangsan₁ is very friendly; I cannot find a person₂ that (he₁) does not like e₂.”

(15) wo faxian xiaotou₁ [yinwei jingcha zhao-bu-dao I discover thief because policeman seek-not-find [ e yuanyi kanguan e₁/e₃ de]] ren₂ deyi-di zou le.
    willing supervise de person proudly leave le
  “I discovered that the thief₁ left proudly because the policemen were not able to find people who were willing to supervise (him₁).”

(16) wo₁ yinwei [ e₁/₂ bu xihuan Zhangsan ] you diar I because not like Zhangsan have slight buhaoyisi.
    embarrassed
  “I am somewhat embarrassed because e does not like Zhangsan.”

As illustrated, a missing object can be interpreted as referring to a subject or topic in the discourse across an island boundary. In contrast, the interpretation of empty subjects must be sensitive to the Generalized Control Rule (Huang 1982), requiring empty pronouns to be identified by the closest c-commanding nominal.

In addition, there exists a contrast in the availability of indefinite and sloppy readings between missing subjects and objects (Miyagawa 2010; Şener and Takahashi 2010; but cf. Oku 1998 for Japanese). Empty subjects are not acceptable as deleted indefinite nominals; but empty objects are fine. The following example shows that the indefinite subject cannot be deleted, in contrast to the acceptability of indefinite objects deleted in (8).

(17) ta kandao yi-ge keren dian-le longxia; wo kandao he see one-cl. guest order-le lobster I see *(yi-ge keren) dian-le yu.
    one-cl guest order-le fish
  “(yi-ge keren) ordered lobster; I saw (a guest) ordered fish.”

En
In addition, missing subjects and objects differ in the possibility of sloppy readings. (18a–b) below show that a sloppy interpretation is available to a missing object, not a missing subject. The empty subject in (18a) can only be interpreted as co-indexed with the matrix subject.5

(18) a. Zhangsan, [yinwei ziji, de/ta,de erzi jiao-guo shuxue]  
Zhangsan because self’s/his son teach-ASP math  
hen gaoxing;  
very happy  
Lisi because teach-ASP linguistics very proud  
"Zhangsan, is happy because self’s/his son has taught math; Lisi, is proud because e, has taught linguistics."

b. Zhangsan, [yinwei wo jiao-guo ta,de erzi] hen gaoxing;  
Zhangsan because I teach-ASP his son very happy  
Lisi, [yinwei wo mei jiao-guo (ta,de erzi)] hen bu  
Lisi because I not teach-ASP his son very not  
gaoxing happy  
"Zhangsan, is happy because I have taught his, son; Lisi, is not happy because I have not taught [his, son]."

The sloppy reading again is available to the missing object in (19b) below, containing a reflexive or bound pronoun in the antecedent clause, in contrast to (19a), whose subject cannot be missing.

(19) a. Zhangsan, xihuan [ziji, erzi renshi de ren];  
Zhangsan like self/he son know DE people  
Lisi, xihuan [* (ziji, erzi) bu renshi de ren]  
Lisi like self/he son not know DE people  
"Zhangsan, likes the people that self’s/his son knows; Lisi, likes the people that * (self’s/his, son) does not know."

b. Zhangsan, xihuan [renshi ziji, erzi de ren];  
Zhangsan like know self/he son DE people  
Lisi, xihuan [bu renshi (ziji, erzi) de ren]  
Lisi like not know self/he son DE people  
"Zhangsan, likes the people that know self’s/his, son; Lisi, likes the people that do not know (self’s/his, son)."

The examples so far show a clear asymmetry in interpreting empty subjects and empty objects. Only missing objects allow indefinite or sloppy interpretations. Missing objects can be interpreted with antecedents across island boundaries in A or A′-positions or an empty discourse topic; whereas missing subjects are quite restricted in interpretive possibilities. Why is there such a subject/object asymmetry? Li (2005) and Aoun and Li (2008) argue that the asymmetry follows from
the conflicting requirements on the identification procedure for empty pronouns (pro/PRO) and the general disjointness requirement on pronouns. According to Huang (1982), empty pronouns must be identified by the first c-commanding nominal – Generalized Control Rule (GCR). They should also obey Binding Principle B because they are pronouns. An empty pronoun is acceptable in the subject position: according to the GCR, it is identified by the subject of a higher clause because the higher subject is the first possible antecedent for the missing subject. At the same time, it is free in the lower clause containing it because the clause contains a subject (Binding Principle B). However, an empty pronoun in the object position has to be bound by the subject of the same clause according to the GCR and be free from it due to Binding Principle B. The conflicting requirements make an empty pronoun (PRO/pro) impossible in the object position. Accordingly, Huang (1982) suggests that an empty object should be a variable bound by an empty topic. Nonetheless, we saw earlier that empty objects could not be subsumed under a variable analysis. They can be within islands bound by an A or A′-antecedent across island boundaries, unlike topicalization cases, which are subject to island constraints and only involve A′-antecedents. The possibility of empty objects interpreted as indefinite also argues against a variable analysis. In other words, the empty object cannot be variable or a pro. Because the empty object cannot be any one of the known empty categories in the generative grammatical theory (Chomsky 1981, 1995), it is a true empty element. The observed subject/object asymmetry follows if a true empty element (TEC) is a last resort, forced by the impossibility of an empty pronoun that is subject to the Generalized Control Rule. A TEC is simply a position in the tree structure, not containing features such as [+pronominal], [+anaphoric] or person, number, gender. The true emptiness of a TEC is further supported by a variety of patterns whose objects cannot be empty because the contents of the missing objects need to be accessed, some of which are demonstrated in the following sections (see Li, to appear, for more constructions demonstrating the properties of a TEC and the comparison between a TEC approach and other alternatives).

2.1.2 Double-object constructions disallowing direct objects missing. In Chinese, a verb and an “inner object” can combine to license an “outer object.” The wide availability of an additional object has been noted frequently in the literature (see, for instance, Thompson 1973 (also the notion of “retained object”); for some recent works, see Huang 2007; Huang et al. 2009: ch. 4). The main pattern illustrating this possibility involves a typical single complement verb taking two objects, as in (20)–(21) below. These examples are from Lu (2002).

(20) wo qu-le ta-jia yi-ge guinu.
   I marry-le he-family one-cl daughter
   “I married a daughter of his family’s.”

(21) wo chi-le ta yi-ge pingguo.
   I eat-le he one-cl apple
   “I ate an apple of his.”
In these cases, the second object after the verb is the one normally subcategorized for by the verb, referred to as “inner object” for convenience. The first object, the one right after the verb, is an “outer object,” which alternatively can be referred to as “affected object.” Huang (2007) notes that the additional outer argument is possible (receiving “affected” theta-role) when the verb and the inner object can combine and describe an action that is highly transitive. The verb and the inner object together form a transitive verb and assign an “affected” theta-role to the outer object:

(22) \[ V \text{ outer object} \ [ V \text{ inner object} ] \] (V raised to derive the right word order)

theta-role

Huang further observes that the inner object (the theme) cannot be missing in these cases. Note that the prohibition against deleting only the inner object is true even when a parallel structure is available – the typical context most favorable to “deletion”:

(23) wo qu-le ta-jia yi-ge guinu; ta qu-le wo-jia *
I marry-le he-family one-CL daughter he marry-le I-family
(yi-ge guinu).
one-CL daughter
“I married a daughter of his family’s; he married my family.”

(24) wo chi-le ta yi-ge pingguo; ta chi-le wo *(yi-ge
I eat-le him one-CL apple; he eat-le me one-CL
pingguo) apple
“I ate an apple of his; he ate me.”

The impossibility of deleting the inner object in such constructions contrasts with the possibility of deleting either of the two objects in typical double-object constructions (also see note 9):

(25) a. women song/gei-le ta yi-zhang piao; tamen ye
we give-le him one-CL ticket; they also
song/gei-le ta.
give-le him
“We gave him a ticket; they also gave him.”

b. women song/gei-le ta yi-zhang piao; tamen ye
we give-le him one-CL ticket; they also
song/gei-le yi-zhang piao.
give-le one-CL ticket
“We gave him a ticket; they also gave a ticket.”
2.1.3 Unaccusative verbs  In addition to the construction involving inner and outer objects like those above, Chinese also allows an unaccusative verb and its internal argument to combine and take an additional argument, bearing some relation with the internal argument. The additional argument can surface as the subject of the sentence, interpreted as the experiencer of the event.

(26) Zhangsan si-le fuqin.
    Zhangsan die-le father
    “Zhangsan had (his) father died.”

(27) tamen zuotian lai-le keren
    they yesterday come-le guest
    “They had (their) guests arriving yesterday.”

What is relevant is that when only one argument surfaces, this argument must be interpreted as the theme, rather than the experience, of the event (Lu 1987; Cheng and Huang 1994; Huang 2007).

(28) Zhangsan si-le fuqin; Lisi ye si-le *(fuqin).
    Zhangsan die-le father Lisi also die-le father
    “Zhangsan had (his) father died; Lisi also died.”

(29) tamen zuotian lai-le keren; women ye lai-le *(keren)
    they yesterday come-le guest; we also come-le guest
    “They had guests coming yesterday; we also came.”

Note that not all the cases with an experiencer subject and a theme object disallow missing objects. The sentences below, including both psych and non-psych verbs, are quite acceptable with the objects missing:

Experiencer Subject – Theme Object

(30) Zhangsan diao/wang-le shu; Lisi ye diao/wang-le (shu).
    Zhangsan lose/forget-le book Lisi also lose/forget-le book
    “Zhangsan lost/forgot books; Lisi also lost/forgot (books).”

(31) wo hen pa/xihuan ta; tamen ye hen pa/xihuan (ta).
    I very fear/like him they also very fear/like him
    “I am afraid of/like him; they also are afraid (of him)/like (him).”

The two sets of constructions, (26)–(29) vs. (30)–(31), have the same thematic roles for their arguments – experiencer as subject and theme as object. They are only distinguished by how the arguments are generated. In the latter, the verbs are two-argument verbs, whereas those in the former are one-argument verbs. The latter allow missing objects, not the former. This contrast indicates that verbs still play an important role in the thematic assignment to the arguments. A verb may
be subcategorized for an internal argument only, as in (26)–(29), or for two arguments, as in (30)–(31). The argument in the subject position in (30)–(31) is related to the lexical subcategorization properties of the verb; but the subject in (26)–(29) is an addition licensed by the verb and the internal object, just like the licensing of an outer object by a verb and its inner object in the cases discussed in the previous section. In other words, two ways of generating arguments must be recognized: one from the lexical properties of verbs, and the other an addition in the appropriate syntactic structure licensed by the combination of a verb and its object. The outer object in (20)–(24) and the subject in (26)–(29) are not generated according to the lexical subcategorization properties of the relevant verbs, in contrast to the arguments in (25) and (30)–(31). The consequence of such a distinction is that the syntactically added argument licensed by the combination of a verb and its object cannot survive if the object is missing. This is so even in the context of parallel structures most conducive to “deletion.” A missing object is not available to collaborate with a verb to license the occurrence of another argument.\textsuperscript{10}

There are other constructions disallowing objects to be missing, because the emptiness of missing objects fails to provide contents to license the merger of other elements, such as the structure involving a secondary predicate and the sluicing construction with the “sprouting” of a remnant corresponding to an empty object. Due to the limited space, we will not go into the details of these constructions, nor the exact mechanisms to account for the relevant structures (available in Li to appear; Li and Wei in preparation). Suffice it to state that null objects in Chinese argue for the need to recognize the possibility of truly empty elements in syntactic structures.

Next, we turn to the missing element inside a nominal expression and demonstrate the same point: the existence of truly empty elements.

2.2 \textit{NP(N')-ellipsis}

A Chinese nominal expression in an argument position, represented as a DP, can contain an N (and NP), other heads (Classifiers, Determiners, for instance), and modifiers (for a recent discussion, see Huang \textit{et al.} 2009: ch. 8). Simply for convenience, let us refer to the N (or NP) as the head of the nominal expression. A nominal head can be preceded by a modifying phrase. An important characteristic of the nominal expressions in Chinese is that the head can be empty when a modifying phrase XP with \textit{de} appears, \textit{de} being a modification marker, schematically represented below:

\begin{equation}
(32) \quad [\text{DP/NP} \; \text{XP} \; \text{de} \; [\text{NP} \; \emptyset]]
\end{equation}

What is such an empty head? Clearly, it cannot be an NP-trace or a variable because it does not require an A or A’-antecedent and is not derived by movement. Nor can it be an empty pronoun, which should be a DP\textsuperscript{11} and subject to the identification condition (control). The options left for the empty element are either: (i) it is the null counterpart of \textit{one} in English, or (ii) it is truly empty (the TEC, also
see Panagiotidis 2003 for a content-less empty noun). We show below that the latter option should be adopted. The first piece of evidence comes from the constructions involving relativization (Aoun and Li 2003: ch. 6). Briefly, the support is built on the fact that not all the instances of the form in (32) are acceptable. The unacceptaible constructions can be attributed to the lack of contents of the missing elements – TEC.

Consider the structures containing relativization of the form \[ [\text{relative clause } \text{XP} \text{ de}] [\text{NP} \text{ Ø}] \]. Most important is the fact that a null head is possible only in certain cases. It is acceptable in (33a), where the subject of the relative clause is relativized, and in (33b), where the object is relativized. However, when an adjunct how/why is relativized, a null head is not acceptable in (33c, d) (see, among many others, Guo 2000; J. Shen 1999; Y. Shen 2002; Yuan 1995; Zhu 1961; Aoun and Li 2003 for discussions on null-head relative clauses in Chinese):

(33)

a. lai zher de Ø
   come here de
   “(the one) that came here”

b. ta zuo de Ø
   he do de
   “(the thing) that he did”

c. *ta xiu che de Ø
   he fix car de
   “(the way) that he fixed the car”

d. *ta likai de Ø
   he leave de
   “(the reason) that he left”

In addition, when a relative construction contains a pronoun in the relativized position, a null head is not possible:

(34) \[ [\text{wo yiwei tamen, dou hen renzhen de}] *(naxie xuesheng),] \]
\[ I \text{ think} \quad \text{they} \quad \text{all} \quad \text{very diligent de} \quad \text{those student} \]
\[ \text{faner dou mei de jiang.} \quad \text{contrarily all not get prize} \]
\[ “(Those students) that I thought they were diligent did not win the prize, unexpectedly.” \]

(35) \[ [\text{ni shuo Zhang hui dai ta, huilai de}] *(na-ge xuesheng),] \]
\[ I \text{ want see} \quad \text{you say} \quad \text{Zhang will bring him back de} \]
\[ *(na-ge xuesheng),] \]
\[ \text{that-cl student} \]
\[ “I want to see (the student) that you said that Zhang would bring him back.” \]

The following sentences minimally contrast with (34)–(35), showing that a resumptive pronoun affects the acceptability of a null head:
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(36) [[wo yiwēi Ø, dou hén rènzhēn de] (nàxiè xuēshēng),] I think all very diligent de those student
fanér dou méi de jiāng.
contrarily all not get prize
“(Those students) that I thought were diligent did not win the prize,
unexpectedly.”

(37) wǒ xiāng kàn [[ni shuō Zhāng huí dài Ø, huìlái de] (nà-ge xuēshēng),] I want see you say Zhang will bring back de that-cl student
“I want to see (the student) that you said that Zhang would bring back.”

These cases also demonstrate the challenge in claiming that the missing NP is the equivalent of the English one. The sentences above with resumptive pronouns would be acceptable with one in the corresponding English sentences, as long as resumptive pronouns are allowed. For instance, there is no contrast between the use of the student and the one in the following examples.

(38) a. I want to see the student/the one that you got angry because he would not come.
   b. I want to see the student/the one that you said that John would bring him back.

With respect to the adjunct relativization cases, it is not that expressions of “how/why” cannot be “deleted.” As long as a relative clause does not occur, a phrase followed by de can precede an empty head whose interpretation is related to “how/why”:

   he fix car de method compare I fix car de method good
   “The way he fixes cars is better than the way I fix cars.”
   he fix car de method compare I fix care de good
   “The way he fixes cars is better than (the way) I fix cars.”
   he fix car de method compare I de good
   “The way he fixes cars is better than mine.”

(39a–c) contrast with the cases of argument relativization, which allow the head to be empty, regardless of whether or not the XP in (32) is a relative clause:

   he buy de car compare I buy de good
   “The car he bought is better than the one I bought/mine.”

Even when there is a “resumptive how/why” in the relativized position, clearly marking what is relativized, a null head is still not possible in such adjunct relativization:

(41) a. wo ting-shuo-guo ta **ruhe/zenme** xiu che de *(fangfa,).
   I hear-say ASP he how fix car DE method
   “I have heard about the (way) (how) he fixed the car.”

b. wo ting-shuo-guo ta **weishenme** bu lai de *(liyou,).
   I hear-say-ASP he why not come DE reason
   “I have heard about the (reason) why he would not come.”

These restrictions show that what is relativized, and whether a resumptive pronoun appears, affect the possibility of a null head. According to Aoun and Li (2003: ch. 5–6), the following different types of relativization need to be distinguished according to their behavior with respect to movement and resumption:

(42) NP relativization with a gap
    [[CP [IP . . . [NP t] . . . ]] [Head NP ]]
    – direct NP movement to the head nominal phrase

(43) NP relativization with a resumptive pronoun
    [[CP OP1 [IP . . . [NP pronoun] . . . ]] [Head NP ]]
    – Head nominal phrase base-generated, an operator (OP) in Spec of Comp
      co-indexed with a resumptive pronoun (RP)

(44) Adjunct relativization
    [[CP OP1 [IP . . . [RP t] . . . ]] [Head NP ]]
    – Head nominal phrase base-generated, OP movement to Spec of Comp

The characteristics of different relative constructions in (42)–(44) are the key to understanding the (im)possibilities of a null head in these patterns. Recall that a null head is impossible in these two cases: argument relativization with a resumptive pronoun and adjunct relativization. In other words, the relative constructions involving an operator, (43) and (44), do not allow a null head, in contrast to those without the relative operator (42). The generalization that emerges is that the possibility of a null relative operator is correlated with the presence of a lexical head (in contrast to a null head). A mechanical way of understanding a null operator being well-formed is that it is licensed by the nominal head of the relative construction and agrees in features with it, or that the range of the null operator needs to be determined by the nominal head (Chomsky 1986). The (im)possibilities of a null head follow if the null head is a true empty element devoid of content that needs to be accessed by a null operator – the TEC.

In addition, relativized process nouns (or noun phrases, when occurring with modifiers) cannot be deleted because they are thematic-role assigners. That is, they must contain thematic features and cannot be truly empty.
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(45) a. tamen pohuai na-ge chengshi.
   they destroy that-cl city
   “They destroyed the city.”

   b. “tamen dui na-ge chengshi de [NP (na-eci (de) pohuai)]
   they to that-cl city DE that-time DE destruction
   “the destruction (that time) to that city by them”

(46) tamen dui shehui de (quan-li) fengxian chixu-le henduo nian;
   they to society DE whole-effort devotion continue-le many year
   keshi women dui shehui de *((quan-li) fengxian) hen kuai jiu ting le.
   but we to society DE whole-effort devotion very fast then stop LE
   “Their serious devotion to the society continued for many years; but our
   (devotion) to the society stopped fast.”

In brief, even though NP and DP ellipsis seem to be productive in Chinese,
there exist many interesting constraints, suggesting that these missing elements
do behave differently from their overt counterparts. They are truly empty.
Next, we turn to VP-ellipsis, which is indicative of the need of an additional
option to derive ellipsis constructions.

3 VP-ellipsis

Modals/auxiliaries in Chinese allow the VP following them to be missing:

(47) Ming hui xihuan ni gei ta de liwu. Han ye hui.
    Ming will like you give him DE gift Han also will
    “Ming will like the gift you gave to him; Han also will.”

VP-ellipsis constructions in Chinese do not require a linguistic antecedent. The
following example in Chinese is quite acceptable in the appropriate context
without a linguistic antecedent.

(48) You are throwing darts with friends and having a good time. Another
    friend drops by, sees the fun; he/she may say:
    a. wo ye hui.
       I also can
       “I can (throw darts), too.”
    b. haoxiang wo renshi de ren dou hui.
       apparently I know DE person all can
       “Apparently, all the people I know can.”

The construction allows true sloppy interpretations, showing the expected pat-
terns on mixed readings discussed in Fiengo and May (1994) and G. Li (2002) (also
see Hoji 1998 for Japanese).
Zhangsan hui shuo ta xihuan tade laoshi; Lisi ye hui.
Zhangsan will say he like his teacher Lisi also will
a. “Zhangsan1 will say he1 likes his1 teacher; Lisi2 will say (he2 likes his2 teacher).”
b. “Zhangsan1 will say he1 likes his1 teacher; Lisi2 will say (he2 likes his1 teacher).”
c. “Zhangsan1 will say he1 likes his1 teacher; Lisi2 will say (he2 likes his1 teacher).” (Mix 1)
d. “Zhangsan1 will say he1 likes his1 teacher; Lisi2 will say (he1 likes his2 teacher).” (Mix 2)

Zhangsan hui shuo tade laoshi xihuan ta; Lisi ye hui.
Zhangsan will say his teacher like him Lisi also will
a. “Zhangsan1 will say his1 teacher likes him1; Lisi2 will say (his2 teacher likes him2).”
b. “Zhangsan1 will say his1 teacher likes him1; Lisi2 will say (his2 teacher likes him2).”
c. “Zhangsan1 will say his1 teacher likes him1; Lisi2 will say (his2 teacher likes him1).” (Mix 1)
d. “Zhangsan1 will say his1 teacher likes him1; Lisi2 will say (his1 teacher likes him2).” (Mix 2)

The VP-ellipsis construction allows the inclusion of adjuncts in the interpretation of the missing part, in contrast to the cases of the stranded V construction (V followed by missing objects, see G. Li 2002; Xu 2003; Li 2005; Oku 1998 and others for Japanese).

wo jian-guo ta sanci le; tamen ye yao/ tamen mei-you.
I see-ASP him three.times LE they also will/ they not-have
“I have seen him three times; they also will/have not (seen him three times).”

ta (zhu) na-dao cai zhu de hen haochi; wo ye hui/ wo mei-you.
he cook that-cl dish cook de very delicious I also can/ I not-have
“He cooked that dish deliciously; I also can/haven’t cooked (the dish deliciously).”

In addition to the VP-ellipsis structure licensed by modals or auxiliaries, there is another construction with shi “be,” which has sometimes been taken as a VP-ellipsis construction as well (see, for instance, Ai 2006; G. Li 2002; Soh 2007; Wei 2009b; Wu 2002; Xu 2003). We show below that the two constructions are not identical. In the following discussions, we will refer to the VP-ellipsis structure licensed by modals or auxiliaries as the Aux construction, and the ellipsis construction licensed by shi as the shi construction. We will show that the shi construction is much more limited in distribution, as compared to the Aux construction. This restriction is due to the unique properties of shi.
Shi generally serves as a focus marker and a copular verb, illustrated by (53a) and (53b) respectively.

(53) a. Ming shi hen xihuan ni gei ta de liwu.
Ming be very like you give him de gift
“Ming indeed likes the gift you gave to him.”

b. Ming shi xuesheng.
Ming be student
“Ming is a student.”

The entire part following the shi of the sentence can be missing – the shi construction:

(54) Ming hen xihuan ni gei ta de liwu. Han ye shi.
Ming very like you give him de gift Han also be
“Ming likes the gift you gave to him; Han also does.”

The shi construction allows sloppy and strict interpretations, like the Aux construction. In (54) above, Ming likes the gift given to Ming himself and Han may like the gift for Han himself.

Similarly, the (im)possibilities of mixed readings are like those of the Aux construction.

(55) John hui shuo ta xihuan tade laoshi, Bill ye shi.
John will say he like his teacher Bill also be
a. “John₁ will say he₁ liked his₁ teacher; Bill₂ will also say he₁ liked his₁ teacher.”

b. “John₁ will say he₁ liked his₁ teacher; Bill₂ will also say he₂ liked his₂ teacher.”

c. “John₁ will say he₁ liked his₁ teacher; Bill₂ will also say he₂ liked his₁ teacher.” (Mix 1)

d. “John₁ will say he₁ liked his₁ teacher; Bill₂ will also say he₂ liked his₂ teacher.” (Mix 2)

(56) John hui shuo tade laoshi xihuan ta, Bill ye shi.
John will say his teacher like him Bill also be
a. “John₁ will say his₁ teacher liked him₁; Bill₂ will also say his₁ teacher liked him₁.”

b. “John₁ will say his₁ teacher liked him₁; Bill₂ will also say his₂ teacher liked him₁.”

c. “John₁ will say his₁ teacher liked him₁; Bill₂ will also say his₁ teacher liked him₂.” (Mix 1)

d. “John₁ will say his₁ teacher liked him₁; Bill₂ will also say his₂ teacher liked him₁.” (Mix 2)
However, the shi and Aux constructions differ in several respects. For instance, the shi construction, not the Aux construction, requires a linguistic antecedent. The scenario described in (48) does not allow the form of [subject + ye shi] “subject + also be.” This property is due to the function of shi in the shi construction, which is to confirm (or deny) the correctness of the previous statement, much like the short answer shi(de) “correct” to a yes/no question:

(57) Q: ta bu yinggai mingtian qu ma? Ans: shi (de).
   “He should not go tomorrow?” “Correct.”

Answering with shi means the proposition underlying the question is correct – it is correct that “he should not go tomorrow” in (57). The negative answer in (58) below means that the proposition underlying the question, “he should not go tomorrow,” is not correct – that “he should not go tomorrow” is not correct:

(58) ta bu yinggai mingtian qu ma? bu shi (ta yinggai mingtian qu).
    “He should not go tomorrow? Not correct (he should go tomorrow).”

In these sentences, shi “be” expresses the correctness of the proposition underlying the question.

The shi construction further contrasts with the Aux construction in regard to locality conditions. For example, the shi construction obeys island conditions, in contrast to the Aux construction:

(59) a. *yinwei (wo zhidao) ta bu shi, (suoyi) wo yiding de zhaogu tamen.
   “Because (I know) he is not, I will definitely take care of them.”

b. *wo yiding de zhaogu tamen, yinwei (wo zhidao) ta bu shi,
   I definitely should care them because I know he not be
   “I will definitely take care of them, because (I know) he is not.”

cf.

(60) a. yinwei (wo zhidao) ta bu hui, (suoyi) wo yiding de zhaogu tamen.
   “Because (I know) he not will therefore I definitely should care them
   “I will definitely take care of them, because (I know) he not will

b. wo yiding de zhaogu tamen, yinwei (wo zhidao)
   I definitely should care them because I know
   he not will
   “I will definitely take care of them, because (I know) he not will (take care of them).”
One might suggest that the island constraint be accommodated by *shi* undergoing movement, being a focus marker, just like the impossibility of a focus *shi* within islands illustrated below:

(61) yinwei ta (*shi) bu neng lai, women hen shiwang.
because he be not can come we very disappointed
“We were disappointed because he (*FOCUS) cannot come.”

However, the focus movement account does not accommodate all the cases that do not accept the *shi* pattern. For instance, the examples in (62a, b) do not contain islands; yet the *shi* construction is much less acceptable than the Aux construction in (63) or the construction without any embedding (62c):

(62) a. *Zhangsan xiwang Lisi hui xihuan yinyue; wo ye xiwang Lisi (ye) shi.*
    Zhangsan hope Lisi will like music I also hope Lisi also be
    “*Zhangsan hopes that Lisi will like music; I also hope Lisi is.*”
    cf. b. *Zhangsan bu xiwang Lisi xihuan yinyue; wo xiwang Lisi shi.*
    Zhangsan not hope Lisi like music I hope Lisi be
    “*Zhangsan does not hope that Lisi will like music; I hope that Lisi is.*”
    cf. c. Lisi hui xihuan yinyue; Wangwu ye shi.
    Lisi will like music Wangwu also be
    “Lisi will like music; so is the case with Wangwu (Wangwu also will like music).”

(63) a. Zhangsan xiwang Lisi hui xihuan yinyue; wo ye xiwang Lisi hui.
    Zhangsan hope Lisi will like music I also hope Lisi will
    “Zhangsan hopes that Lisi will like music; I also hope Lisi will.”
    b. Zhangsan bu xiwang Lisi hui xihuan yinyue; wo xiwang Lisi hui.
    Zhangsan not hope Lisi like music I hope Lisi will
    “Zhangsan does not hope that Lisi will like music; I hope that Lisi will.”

This contrast might be related to the function of the *shi* pattern – to express the (in)correctness of the proposition in the previous utterance (i.e., whether the proposition is true or false). In the case of embedding (62a–b), *shi* is not directly used to confirm the previous utterance and is related to only part of the previous utterance, which might be the cause for the degraded acceptability. However, the exact nature of the constraint needs to be more precisely phrased. We leave this issue to a separate work.

What is clear is that *shi* in the *shi* construction is subcategorized for a category larger than what the Aux in the Aux construction is subcategorized for (cf. Paul 1996, 1999; Huang 1988 for instance). That is, *shi* should be at least higher than an Aux. What is missing may be everything following the subject, including auxiliaries, sentential adverbials, and negation:
(64) tamen dagai bu hui lai. women ye shi.
    they probably not will come we also be
    “They probably will not come. So is the case with us = we probably will
    not come, either.”

The following sentences further demonstrate the fact that shi selects a constituent
larger than those Aux selects.

(65) ta bu hui lai, wo ye bu hui.
    he not will come I also not will
    “He will not come; I will not, either.”

(66) ta bu hui lai, wo ye shi.
    he not will come I also be
    “He will not come, so is the case with me as well (=I will not come either).”

(67) *ta bu hui lai, wo ye bu shi.
    he not will come I also not be
    “He will not come; it is not so with me either (neither will I).”

Note that (65) and (67) contrast in the acceptability of a negation preceding an
Aux and the unacceptability of a negation preceding shi. Ye shi “also be” means
the statement in the first clause in these examples also applies to the subject of the
second clause. Accordingly, it is not surprising that negation is not possible in (67).
In this sentence, the use of ye “also” indicates that the statement in the first clause
should also hold true with the subject of the second clause. The use of bu shi “not
be” suggests otherwise: the statement in the first clause is not true with the subject
of the second clause. A conflict is created.

Because shi “be” expresses the correctness of the proposition underlying the
question or the statement in the first clause in (66)–(67), we may claim that shi is
subcategorized for an IP. Therefore, the empty category associated with shi ellip-
sis is an IP.

In brief, the Aux and shi constructions differ in the necessity of a linguistic
antecedent. The shi, not the Aux construction, needs one. The requirement of a
linguistic antecedent in the shi construction is related to the fact that shi is to
confirm or deny the correctness of the proposition expressed by the linguistic
antecedent applying to the constituent before shi in the anaphoric clause (gener-
ally subject or/and topic). The shi construction has a larger constituent missing
than the Aux construction.

Having identified the missing phrase in the Aux and shi construction, we turn
to the issue of their syntactic representations. Recall that the missing elements
discussed in Section 1 are truly empty in syntax, inaccessible to syntactic pro-
cesses, and unable to license the merger of related constituents. We noted that
sentences like (68a) and (69a) below are not acceptable because the argument
appearing in the subject position is not licensed: the object that needs to combine
with the verb to license this additional argument is missing. The same reasoning would force us to acknowledge the existence of the missing object and the missing verb at least at some point in the VP-ellipsis (the Aux and shi) structure so that the argument appearing in the subject position can come into existence before VP-ellipsis applies.

(68) a. Zhangsan si-le yi-tiao yu; Lisi ye si-le *(yi-tiao yu).
   Zhangsan die-le one-cl fish Lisi also die-le one-cl fish
   “Zhangsan had a fish died; Lisi also died.”
   b. Zhangsan hui si yi-tiao yu;
   Lisi ye hui (si yi-tiao yu)/ ye shi (hui si yi-tiao yu).
   Lisi also will die one-cl fish/also be will die one-cl fish
   “Zhangsan will have a fish died; Lisi also will/the same will also be true with Lisi.”

(69) a. tamen zuotian lai-le yi-ge keren; women
   They yesterday come-le one-cl guest; we
   ye lai-le *(yi-ge keren)
   also come-le one-cl guest
   “They had a guest coming yesterday; we also had (a guest) coming.”
   b. tamen mingtian hui lai yi-ge keren; women ye
   they tomorrow will come one-cl guest; we also
   hui (lai yi-ge keren)/ ye shi
   will come one-cl guest/also be
   “They will have a guest coming tomorrow; we also will (come a guest)/the same will be true with us.”

On the other hand, wh-movement of the object from a missing VP is not possible:16

(70) tamen hui chi de juizi yiding hen tian;
   they will eat de orange certainly very sweet
   bu hui *(chi) de juizi yiding bu tian.
   not will eat de orange certainly not sweet
   “The orange they will eat will certainly be sweet; the orange (they) will not *(eat) certainly will not be sweet.”

This suggests that VP-ellipsis in Chinese is a very close counterpart of the British English do VP-construction as in Baltin (2012) – the object inside the missing VP can undergo some movement, such as raising to subject, but not other processes such as wh-movement. In other words, VP-ellipsis constructions in Chinese can be better accommodated by a deletion-in-syntax approach, as proposed by Baltin.17

Finally, we discuss the so-called sluicing structure in Chinese.
4 Sluicing

This section will show that Chinese sluicing is not true sluicing in the sense of ellipsis, but a pseudo-sluicing construction (Merchant 2001) with a simplex structure, \([\text{pro} + (\text{copula} +) \text{ predicate}]\). Therefore, the debate on which approach can better accommodate sluicing constructions cannot find evidence in the corresponding Chinese structure.

4.1 Sluicing in Chinese is not true sluicing

Sluicing typically refers to the pattern illustrated by the English sentences below.

(71) a. Jack bought *something*, but I don’t know what.
    b. John saw Mary *somewhere*; but I don’t know where.
    c. Jack left, but I don’t know why.

The examples in (71) all have a stranded *wh*-phrase in place of a fully spelled out clausal *wh*-question, which is formed by moving the *wh*-phrase to the left periphery of the clause. Because Chinese does not front its *wh*-phrase to form a *wh*-question, the debate has been on whether a construction corresponding to the sluicing construction in (71) exists in this language.

The properties of the sluicing construction have largely been accommodated by a deletion approach in recent years – all but the *wh*-phrase at the clausal periphery is deleted at PF (the PF deletion approach, represented by Merchant 2001). Extending such an analysis to the Chinese counterpart faces the following challenges. First, it is difficult to give an adequate account for why the copula *shi* is required when the remaining phrase cannot be a predicate. As shown in (72a–d), *shi* is optional in front of all the *wh*-phrases except for the two *wh*-words, *shei* “who” and *shenme* “what.”

(72) a. Zhangsan kandao mouren, danshi wo bu zhidao
    "Zhangsan saw somebody, but I don’t know who/what person.”

b. Zhangsan mai-le yixie-dongxi, danshi wo bu zhidao
   "Zhangsan bought something, but I don’t know what/what thing.”

c. Zhangsan (zai mouge-difang/mouge-shijian) chu shi le,
   "Zhangsan had an accident (at certain place/in certain time), but I don’t know where/when.”
d. Zhangsan (jìyuān mou-ge liyou) jueding yao xiu xue, 
Zhangsan base.on certain-cl reason decide want leave.school 
danshi wo bu zhidao (shi) weishenme. 
but I not know be why 
"Zhangsan decided to leave school (for certain reason), but I don’t 
know why."

Under a PF-deletion analysis, movement must have taken place so that the remnant can be at the peripheral position of a clause. According to Wang (2002) and Wang and Wu (2006), the movement is a focus movement: the remnant phrase is a focused element raised to the left-periphery. Then, IP-deletion applies to derive sluicing constructions:

(73) a. ta zai mou-ge difang kandao ni, dan wo bu zhidao he at some-cl place saw you but I not know (shi) (zai) shenme-difang. [ta kandao ni]. 
be at what-place he saw you 
"He saw you at some place; but I don’t know at what place."

b. Zhangsan jueding yao xiu xue, danshi wo bu zhidao Zhangsan decide want leave.school but I not know (shi) weishenme [Zhangsan jueding yao xiu xue]. 
be why Zhangsan decide want leave.school 
"Zhangsan decided to leave school, but I don’t know why Zhangsan decided to leave school."

However, such a focus movement approach cannot accommodate all types of *wh*-remnants. For instance, some phrases that are not quite acceptable when fronted unexpectedly can appear as the “remnant of sluicing,” such as some *wh*-elements like *xingqi-ji* “which day of the week” (74a), or quantity expressions such as *duoshao-qian* “how much” (74b).

(74) a. "Biye luxing kuai dao le, danshi wo bu zhidao graduation trip soon reach le but I not know (shi) xingqi-ji [biye luxing kuai dao le]. 
be weekday-which graduation trip soon reach le 
"The graduation trip is almost around the corner, but I don’t know which day of the week."

b. "Cai yue lai yue gui le, danshi wo bu qingchu vegetable more come more expensive le but I not clear (shi) duoshao-qian [cai yue lai yue gui le]. 
be how.much-money vegetable more come more expensive le 
"Vegetables are getting more expensive, but I am not clear by how much vegetables are getting more expensive."
Another difficulty is that the “remnant” wh-phrase sometimes is a sequence of words that is not a constituent and could not have undergone any movement. Under a deletion approach, the remnant bei nayige ren “by which one” in (75) should have been fronted as a constituent. However, the preposing analysis conflicts with the structure of passives noted in Huang (1999) and Huang et al. (2009): bei takes a sentential complement and forms a constituent with the entire constituent following it, not just the nominal phrase.

(75) Ta [bei [mouge ren sha le], danshi wo bu zhidao he Pass some person kill LE but I not know (shi) bei nayige ren.
be Pass which one
“(Lit.) He was killed by someone, but I don’t know by which one.”

A further issue involves the constraint “MaxElide.” To explain the degradation of (76a), which contains a wh-trace within the elided IP, Merchant (2008) formulates a constraint, called the MaxElide – when ellipsis targets an XP containing an A′-trace, XP must not be properly contained in any YP that is a possible target for deletion.

(76) a. ??Ben knows who she invited, but Charlie doesn’t know who she
invited t.
b. Ben knows who she invited, but Charlie doesn’t know who she invited t.

In (76a), the embedded IP of the second conjunct is [she invited t], which contains a wh-trace and is also properly contained within the matrix VP [know who she invited t], a possible target for deletion as in (76b). Accordingly, MaxElide disallows the IP deletion in (76a). Along this line, if Chinese sluicing is derived by IP-deletion after overt wh-movement, just like English sluicing, (77a) should sound cumbersome like its English counterpart, because the IP [ta yao-le t] in (77a), which contains a wh-trace, is properly contained in the possible target for deletion, [shei [ ta yao-le t]] in (77b). However, (77a) is quite acceptable, just like (77b).

(77) a. Zhangsan zhidao shei ta yao-le, Lisi ye zhidao shi shei, [ta yao-le t]
Zhangsan know who he invite-LE Lisi also know be who he invite-LE
“Zhangsan knows who he invited, and Lisi also knows who.”
b. Zhangsan zhidao shei ta yao-le, Lisi ye zhidao [shi shei, [ta yao-le t]]
Zhangsan know who he invite-LE Lisi also know be who he invite-LE
“Zhangsan knows who he invited, and Lisi does, too.”

An apparent argument for a PF deletion approach to Chinese sluicing comes from the construction involving zenmeyang “how.” Wang and Wu (2006) suggest that the unacceptability of sluicing with a “how” remnant is a natural consequence
of a focus movement analysis under a PF-deletion approach. *Zenmeyang* “how” generally cannot undergo focus preposing, illustrated by the contrast between (78a) and (78b). The unacceptability of “how” as the remnant in Mandarin sluicing (79) and (80) has been claimed to reflect the structure and derivation of a sluiced clause: it should have the same full-fledged structure and the same restrictions as a regular clause like (78).

(78)  
\begin{align*}  
\text{a. } & \text{Laowu zenmeyang xiuru Lisi?} \\
& \text{Laowu how insult Lisi} \\
& \text{“How did Laowu insult Lisi?”} \\
\text{b. } & \text{“zenmeyang, Laowu t xiuru Lisi?”} \\
& \text{how Laowu insult Lisi} \\
\end{align*}

(79)  
\begin{align*}  
\text{a. } & \text{“Zhangsan hui qu meigu o, dan wo bu zhidao (shi) zenmeyang.”} \\
& \text{Zhangsan will go America, but I not know be how} \\
& \text{“Zhangsan will go to America, but I don’t know how come/how.”} \\
\text{b. } & \text{“Zhangsan kao-wan shi le, dan wo bu zhidao (shi) zenmeyang.”} \\
& \text{Zhangsan take-finish exam le but I not know be how} \\
& \text{“Zhangsan has finished the exam, but I don’t know how.”} \\
\end{align*}

(80)  
\begin{align*}  
\text{a. } & \text{Zhangsan mei you lai, wo bu zhidao (shi) zenmeyang *(mei you).} \quad \text{(Cause)} \\
& \text{Zhangsan not have come I not know be how not have} \\
& \text{“Zhangsan hasn’t come, and I don’t know why.”} \\
\text{b. } & \text{Laowu xiu ru Lisi, keshi wo bu zhidao (shi) zenmeyang} \\
& \text{Laowu insult Lisi but I not know be how} \\
& \text{* (xiuru).} \quad \text{(Manner)} \\
& \text{insult} \\
& \text{“(lit.) Laowu insulted Lisi, but I don’t know how.”} \\
\text{c. } & \text{Zhangsan kao-wan shi le, dan wo bu zhidao (shi) *(kao-de) \\
& \text{Zhangsan take-finish exam le but I not know be take-de} \\
& \text{zenmeyang.} \quad \text{(Result)} \\
& \text{how} \\
& \text{“Zhangsan finished the exam, but I don’t know the result.”} \\
\end{align*}

However, the challenge to such a line of reasoning is that expressions of *zenmeyang* expressing cause, manner, or result can never occur by themselves. They always require the co-occurrence of the predicate they modify, as illustrated below.\(^{20}\)

(81)  
\begin{align*}  
\text{a. } & \text{Zhangsan you yu lai, wo bu zhidao (shi) zenme *(mei you).} \quad \text{(Cause)} \\
& \text{Zhangsan not have come I not know be how not have} \\
& \text{“Zhangsan hasn’t come, and I don’t know why.”} \\
\text{b. } & \text{Laowu xiu ru Lisi, keshi wo bu zhidao (shi) zenmeyang} \\
& \text{Laowu insult Lisi but I not know be how} \\
& \text{* (xiuru).} \quad \text{(Manner)} \\
& \text{insult} \\
& \text{“(lit.) Laowu insulted Lisi, but I don’t know how.”} \\
\text{c. } & \text{Zhangsan kao-wan shi le, dan wo bu zhidao (shi) *(kao-de) \\
& \text{Zhangsan take-finish exam le but I not know be take-de} \\
& \text{zenmeyang.} \quad \text{(Result)} \\
& \text{how} \\
& \text{“Zhangsan finished the exam, but I don’t know the result.”} \\
\end{align*}

The requirement of a co-occurring modified phrase is not unique to the “how” expressions. The degree expression *duo(me) “how”* has the same property:
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(82) Ta hen jiaoao, dan wo bu zhidao (shi) duo(me) *(jiaoao).

“He is very proud, but I don’t know how proud/to what extent.”

The facts discussed so far demonstrate the challenges in extending a PF deletion analysis of the English sluicing construction to the Chinese counterpart. The difficulties include those regarding the non-parallelism in \textit{wh}-remnants, non-constituent \textit{wh}-movement, and the behavior of \textit{zenme(yang)} “how” and \textit{duo(me)} “how” (and the irrelevance of MaxElide, if it is taken as a property of PF deletion structures). The next section will show that the so-called sluicing in Chinese behaves more like “pseudo-sluicing” than sluicing in English, as argued in Wei 2004, 2009a (also see Adams and Tomioka 2012).

4.2 Pseudo-sluicing

The so-called sluicing in Chinese should be analyzed as a clause containing a predicate and a null subject. When the \textit{wh}-remnant itself is a predicate, the copula \textit{shi} can optionally appear as in (83a); when the remnant is not a predicate, the copula \textit{shi} is required as in (83b).

\begin{enumerate}
  \item a. ta kandao yi-ge ren, dan wo bu zhidao (shi) shenme-ren.
  \begin{itemize}
    \item he saw one-cl. person but I not know be what-person
  \end{itemize}

  “He saw a person; but I don’t know who.”

  \item b. ta kandao yi-ge ren, dan wo bu zhidao *(shi) shei.
  \begin{itemize}
    \item he saw one-cl. person but I not know be who
  \end{itemize}

  “He saw a person; but I don’t know who.”
\end{enumerate}

Wei (2004, 2011) notes that \textit{shei} “who” and \textit{shenme} “what” cannot function as predicates. The other \textit{wh}-elements can all be predicates and occur without the copula \textit{shi}.\textsuperscript{21} The requirement on the occurrence of \textit{shi} in the relevant patterns is determined by the predicate status of the \textit{wh}-phrase.

Because the so-called “remnant \textit{wh}-phrase in Chinese sluicing” must be a predicate itself, or requires \textit{shi} to make a predicate predicated of an empty subject, “sluicing” in Chinese is a misnomer in the sense that it is not identical to the better-understood sluicing in English. A more appropriate label should be “pseudo-sluicing” of the form [Subject (+ \textit{shi}) + \textit{wh}]. The pseudo-sluicing analysis can be further supported by comparison with the English pseudo-sluicing construction.

Merchant (2001: 120–27) presented several differences that separate sluicing from pseudo-sluicing, which has the form [ [subject \textit{it}] [predicate be + \textit{wh}]] in English. First, sluicing can have adjunct and argument \textit{wh}-remnants when their correlates are implicit, whereas pseudo-sluicing cannot as in (84) below.

\begin{enumerate}
  \item a. They served the guests, but I don’t know what (*it was). (Argument \textit{wh}-remnant)
\end{enumerate}
b. He fixed the car, but I don’t know how/why/when (*it was). (Adjunct wh-remnants)

Without an explicit correlate, Chinese “sluicing” or pseudo-sluicing also prohibits an argument wh-remnant as in (85a), just like English pseudo-sluicing (84a). However, Chinese pseudo-sluicing differs from English pseudo-sluicing in the possibility of an adjunct wh-remnant as in (85b).

(85) a. "Zhangsan zhengzai chi, dan wo bu zhidao shi shenme."
    Zhangsan PROG eat but I not know be what
    “Zhangsan is eating, but I don’t know what.”

b. Zhangsan chi-de hen kuai, wo bu zhidao (shi) weishenme.
   Zhangsan eat-de very fast, I not know be why
   “Zhangsan ate very fast. I don’t know why.”

The unacceptability of (85a) is expected under a pseudo-sluicing analysis. The acceptability of (85b) does not necessarily mean that we should return to analyzing the relevant pattern in Chinese as sluicing. Otherwise, the requirement of a predicate in the “sluice clause” would be a mystery. We argue in a separate work that the contrast between (85a) and (85b) is due to the presence or absence of an appropriate antecedent to identify the empty subject. Lack of space prevents us from elaborating on the relevant paradigms to illustrate the identification of the null subject. Suffice it to say that in (85a), there is no object in the first clause to be co-indexed with the null subject in the second clause (cf. the discussion of TEC in Section 2). In (85b), the null subject is identified by the first clause as a whole. That is, the first clause is the antecedent for the null subject.

Another difference between sluicing and pseudo-sluicing observed by Merchant concerns attribute wh-remnants. Pseudo-sluicing allows an attributive wh-remnant with a covert correlate as in (86), but not sluicing. As expected, Chinese pseudo-sluicing parallels English pseudo-sluicing, illustrated by (87).

(86) She bought a car, but I don’t know how big *(it is).

(87) Zhangsan mai-le yi-liang che, dan wo bu zhidao (shi) duo-da.
   Zhangsan buy-LE one-cl car but I not know be how-big
   “(lit.) Zhangsan bought a car, but I don’t know how big.”

Furthermore, sluicing does not allow an aggressively non-D-linked wh-phrase-the hell (Pesetsky 1987) due to the failure of the wh-word to receive emphasis, but pseudo-sluicing does as in (88). In Chinese, the counterpart with daodi is grammatical as in (89).

(88) Someone dented my car last night—
    a. I wish I knew who (*the hell)!
    b. I wish I knew who the hell it was!
In brief, the apparent wh-remnant is not the result of IP-deletion leaving behind a wh-phrase at the clausal left-periphery sluicing in English. Rather, the wh-remnant itself is a predicate or requires the copular verb shi to make a predicate predicated of a null subject. The structure corresponds to pseudo-sluicing in English. No deletion has taken place.

One potential challenge facing the pseudo-sluicing analysis is the possibility of sloppy readings, as noted by Wei (2004, 2009a) and Adams and Tomioka (2012). The subject in the sluice is a pronoun and the availability of a sloppy reading in such a construction is not expected. Replacing the empty subject pro with an overt demonstrative na “that” clearly disallows sloppy readings. Nonetheless, the challenge is not a real problem, as shown by Wei (2011) and Adams and Tomioka (2012). Wei (2011) derives sloppy readings in the contexts of both adjunct and argument wh-remnants by analyzing the empty subject as an E-type pro, a definite description in the sense of Evans (1980). For instance, the pro in (90a) below is a definite expression meaning [the one [who is criticizing x]], and in (90b), [the reason [why x is scolded]]. The index of the variable x is left unspecified and ready to be co-indexed with either the matrix subject of the first conjunct (strict identity) or the matrix subject of the second conjunct (sloppy identity). Adams and Tomioka (2012) observe that sloppy readings are easier to yield with adjunct wh-remnants via sentential (event/propositional) anaphora than with argument wh-remnants by individual-denoting anaphora. Both Wei (2011) and Adams and Tomioka (2012) concur that when the overt demonstrative na “that” serves as overt subject, only strict readings are available due to its strong reference to the antecedent. That is, a pro can be an E-type pronoun, but not the demonstrative na “that.”

5 Conclusion

This chapter discusses the major “ellipsis” constructions in Chinese – argument DP ellipsis, NP ellipsis, VP ellipsis (the Aux construction and the shi construction (IP ellipsis)), and so-called sluicing. The apparent sluicing construction should be
more appropriately labeled as pseudo-sluicing. We have shown that these ellipsis constructions do not represent a coherent class of constructions in the sense that they can all be captured by one single analysis, be it PF deletion or deletion in syntax or interpretive approach (LF copying). The null arguments in the so-called argument ellipsis constructions are truly empty elements that do not participate in syntactic processes and do not license merger of other elements that need to access the contents of such null arguments. On the other hand, VP-ellipsis seems to require the presence of elements in the elided phrase accessible to some syntactic processes but not others, which would be better accommodated by a deletion-in-syntax approach incorporating the notion of phase as in Baltin (2012). Finally, pseudo-sluicing does not bear on the issue of deletion approaches because the entire structure is base-generated.

The question arises as to why both a TEC and a deletion-in-syntax approach are needed. As a speculation, we might explore the nature of different projections. If ellipsis is licensed by a functional category and a functional category is an extended projection of a lexical category (see the many works on extended projections by Jane Grimshaw, 1991, 2000), the presence of a licensing functional category would entail the presence of the lexical category. Therefore, the lexical category must be projected in syntax. In contrast, missing arguments are not licensed by functional categories, as they are licensed by verbs thematically, and are not forced to be present syntactically.

Nonetheless, this is a very tentative speculation. An immediate challenge is NP ellipsis because it is licensed by the modification marker de, which should probably be analyzed as a functional category. Moreover, not all functional categories license deletion or base-generated empty categories. Is there a non ad hoc way to describe the type(s) of heads that can license empty elements? Answers to these issues will help us better tackle the challenges made explicit in this chapter: there need to be different ways generating the so-called ellipsis structures. How many different ways are there to derive ellipsis structures? What are the fundamental motivations for choosing one derivation over another?

NOTES

1. The terms “ellipsis” and “deletion” are not used in any technical sense. They simply mean some elements are not visible or audible but are interpreted (have meanings). There are other types of ellipsis constructions, such as stripping, fragments, gapping, and so on. Because of the limited space, we will focus on the major types of ellipsis mentioned in the text.

2. For instance, to compare a deletion-in-syntax approach as proposed by Baltin (2012), and the PF deletion analysis incorporating the notion of phase-by-phase spellout as in Aelbrecht (2009), would require the comparison of the assumptions on where and how the scope of quantificational expressions is determined, what counts as phases, what adjunction structures are possible, and so on.

See Li (to appear) for the comparison of these similar but not identical approaches—late insertion, LF copying approach to argument ellipsis structures.

These examples use more complex patterns involving islands so that the option of variables can be ruled out, because the involved nominals are definite and could be topics in non-island contexts. Variables may allow sloppy interpretations in subject positions, such as in the following context:

(i) meigeren dou shuo zijide erzi zuixiaohao;
    everyone all say self’s son most good
Zhangsan shuo zijide erzi hui nianshu;
Zhangsan say self’s son can study
Lisi shuo (zijide erzi) hui zhu-an qi-an.
Lisi say self’s son can earn money
    “Everyone said that self’s son was the best; Zhangsan said that self’s son was
good at studying; Lisi said that (self’s son) was good at making money.”

If an overt pronoun is used in place of the empty subject or object, sloppy readings would not be possible.

However, it may contain categorial features. Also note that there have been continuing attempts within the Minimalist Program on eliminating the need to specify features such as pronominal, anaphoric, offering substantially different alternatives to Binding in the tradition of Government and Binding (for instance: Heinitz 2008; Kayne 2002; Safir 2008; Hicks 2009; Reuland 2011; Rooyck and Wyngaard 2011; also see earlier works as in Hornstein 2000). In regard to PRO, it has to be either anaphoric or pronominal but not both at the same time. The operation Move is generally used to derive the relevant locality conditions. However, there have also been many works that argue for the need to recognize the existence of a distinct PRO (see a recent example, Ndayiragije 2012).

See Zhang (1998), Xu (1999), Guo (2004), Lu (2002), and Huang (2007), among others, for the evidence showing that the postverbal constituents in these instances are indeed two separate complements. Guo (2004) emphasizes the aspect of syntactic dynamism in these cases: grammar allowing properties not specified in lexical items. Also see Zhan (1999).

The pattern can be labeled as the “malefactive” construction, very much like the applicative requiring the direct object to be present (cf. Pylkkanen 2008).

It is not easy to define what “highly transitive” is. Teng (1972) takes the ba-construction as a high transitivity construction. However, the ba-construction is not always possible. Lu (2002) notes that such a pattern allows verbs like faxian “discover” as in “I discovered the Wang family three secret rooms,” which does not have a ba counterpart.

Also note that the type of double object verbs discussed here is only a proper set of the so-called qiang “rob,” tou “steal” double-object verbs, to be distinguished from the give type of double-object verbs (see the previous note and Huang 2007 and the references cited there for the structures for the two different types of double-object structures). Lu (2002), following Zhu (1982), notes that the type of direct object construction in question generally requires the second object to be a quantity expression (number+classifier+N). This contrasts with qiang “rob” or tou “steal,” which allows bare nominals as their objects.

(i) Zhangsan qiang/tou-le Lisi xianglian.
   Zhangsan rob/steal-le Lisi necklace
   “Zhangsan robbed Lisi of (his) necklace/stole (Lisi’s) necklace from him.”
This suggests that verbs like qiang "rob" and tou "steal" can be lexically specified as double object verbs, and verbs like chi "eat" acquire their “outer object” only in the specific context syntactically.

This distinction suggests that thematic contributions by lexical items should be recognized, unless the two patterns with the same experiencer-theme arguments have different event structures. In an approach that takes event or aspectual structures as basic, and lexical items are simply roots, not having subcategorization properties, lexical information is irrelevant in syntax. (See Huang 1997; Lin 2001; Borer 2005a,b; Ramchand 2008, among many others. Also see the decomposition and hierarchical structures of lexical items in Hale and Keyser 1993.) The fact that lexical information affects deletion possibilities, noted in this work, indicates that the relevant lexical information should be at work in grammar. The constraint cannot be a matter of pragmatics or world knowledge.

See Postal (1969) for the similarity between pronouns and articles.

This is just like the fact that the relative operators vary with the head in English relative constructions: the person, who, the place, where. The agreement in features must take place in the process of tree building (merger) to ensure the proper morphological form. In other words, even though null relative operators do not have an overt form, they behave like their overt counterparts in requiring licensing before the materials from the antecedent can be recovered at LF.

Ai treats shi as involving deep anaphora. G. Li and Xu take ye-shi “also-be” and ye-Aux to be similar to English VP-ellipsis. Soh and others mentioned in the text have proposed different positions and functions for shi.

This can be more clearly demonstrated by the contrast in answers to yes/no questions between English and Chinese in (i–ii). The choice of yes/no depends on the real-world facts in English and, in Chinese, the proposition underlying the preceding interrogative.

(i)  a. Didn’t he come?
    b. No, he didn’t come. Yes, he did.

(ii) a. ta mei lai ma?
    he not come Q
    “Didn’t he come?”
    b. shi de, ta mei lai.
    be de he not come
    “Yes, he didn’t come.”
    bu shi, ta lai-le.
    not be he come-le
    “No, he came.”
15 It is possible, that instead of IP, the null element is some projection in a split IP structure.

16 Not all the tests used in Baltin (2012) are applicable to the VP-ellipsis construction in Chinese. For instance, a passive in Chinese is only distinguished from an active by the expression bei, immediately followed either by the logical subject or by the verb phrase. When bei appears, a V must also occur, making VP-ellipsis impossible independently.

17 However, a challenge remains: the shi construction requires a linguistic antecedent, but not the Aux construction. If both the Aux and shi construction have full syntactic representations, it is not clear how the distinction in the requirement of a linguistic antecedent can be captured. We leave the issue to further studies.

18 Due to lack of space, we do not discuss how the deletion-in-syntax approach by Baltin (2012) works in this case, as it is not significantly distinct from the PF deletion approach in this respect.

19 To explain the distribution of shi “be,” some PF-deletion analysis such as Wang (2002) allows shi to be optionally inserted. However, this optional insertion cannot account for why shi is obligatory with shei “who” and shenme “what” and optional with the others.

20 This is like the fact that a PP modifying a VP cannot occur without the modified VP in Chinese (e.g., Li 1990):

(i) cong NY *(lai) de ren  
from NY come DE person  
“person *(that came) from NY”

21 Adams (2003) and Wei (2004, 2011, 2012) have independently proposed a similar analysis, according to which a Chinese sluice clause is composed of three essential elements: pro, copula, and wh-remnant. The main difference between the two analyses lies in the generation of shi. Wei (2004) approaches the distribution of shi and the interpretation of subject pro in sluicing from the perspective of predication. In contrast, Adams (2003) states that the presence of shi preceding the wh-remnant, shei “who” or shenme “what,” is to “disambiguate” the indefinite reading of these two wh-words. For the wh-remnants other than these two wh-words, no indefinite reading needs to be disambiguated. The optionality of shi is claimed to be captured indirectly. Later, Adams and Tomioka (2012) concur with Wei’s (2004, 2011) predicational analysis on the distribution of the copula shi.

22 Merchant (2001: 122) ascribes the unacceptability to the fact that English tends to emphasize the phrase who the hell as in (i).

(i) Who the HELL do you think you are?!?

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