Some Remarks on Parasitic Gaps in Chinese*

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The phenomenon of parasitic gaps has evoked extensive discussion in the literature since the first systematic examination by Engdahl (1983). In this paper, we argue that although Chinese is a *pro*-drop language, the gap at issue is not an empty pronoun and does not represent a True Empty Position under Li's (2007a, b) theory; rather, it is a variable. Supporting arguments will be provided to justify the existence of a P-gap in Mandarin Chinese. Close examination of the P-gap in Chinese reveals that it conforms largely to the Current Consensus Positions (CCP) observed for English P-gaps as summarized by Culicover (2001), with some differences possibly due to parametric differences between Chinese and English. In a word, parasitic gaps in Chinese are also licensed largely by the same principles provided in Universal Grammar as those in English.

Key words: parasitic gap construction, empty pronoun, True Empty Position, variable

1. Introduction

The phenomenon of parasitic gaps (henceforth P-gaps) has evoked extensive discussion in the literature since it was first systematically studied by Engdahl (1983). The P-gap construction can be exemplified by the following examples.

(1)   a. Which articles did John file *t* without reading *pg*?
      b. This is the kind of food you must cook *t* before eating *pg*.   (Engdahl 1983)

The first gap, marked *t*, is called a "real gap", because it is in a position that normally allows extraction. The second gap, marked *pg*, appears in a position that normally does not allow extraction, usually within an adjunct, which is regarded as an island in the Principle and Parameter (PnP) theory. The major characteristic of the P-gap construction is that a single filler can be the antecedent of more than one gap. Moreover, the existence of *pg* seems to depend on the existence of *t*. In other words, if

t does not exist, it is impossible for *pg* to occur, as exemplified by the contrast between (2a) and (2b).

(2)   a. Here is the paper that John read *t* before filing *pg*.
    b. *Here is the paper that John read the email before filing *t*.   (Engdahl 1983)

According to Engdahl, (2b) is much worse because the gap has to be understood to be a trace left by relativization. The contrast between (2a) and (2b) shows that a P-gap cannot survive as an independent gap.

   Although in the literature the discussions of P-gap constructions center on English (cf. Chomsky 1982, 1986, Engdahl 1983, and Postal 1994, among others), related research has also focused on languages such as Swedish (Engdahl 1984), Moroccan Arabic (Ouhalla 2001), standard German (Kathol 2001), and French (Tellier 2001), among others.

   When we turn to Mandarin Chinese,[1] given the contrast shown in (3) and (4), P-gaps seem to exist in Chinese as well.

(3)   a. *[wo [zai   laoshi   tichu   *t*   de   shihou]   han   tongxue   liaotian]   de
        I   at   teacher   raise   DE   time   with   classmate   chat   DE
       wenti
       question
       'the question which I was chatting with classmates when the teacher raised it'
    b. [wo [zai laoshi   tichu   *e*   de   shihou⌉   da   bu   chulai   *t*]   de
        I   at   teacher   raise   DE   time   answer   not   out   DE
       wenti
       question
       'the question which I could not answer when the teacher raised it'
(4)   a. *[jingfang [zai   *t*   shizong   zhihou]   kai-le   jizhehui]   de
         police   at   disappear   after   hold-ASP   press.conference   DE
       mingren
       celebrity
       'the celebrity who the police held a press conference after he had disappeared'
    b. [jingfang [zai *e* shizong   zhihou]   sichu   xunzhao   *t*] de   mingren
         police   at   disappear after   everywhere search.for   DE   celebrity
       'the celebrity who the police searched for everywhere after he had disappeared'

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[1] For ease of exposition, we will refer to Mandarin Chinese simply as Chinese.

The ill-formedness of (3a) and (4a) is due to the fact that relativization takes place out of an adjunct island. However, the same extraction out of an adjunct island in (3b) and (4b) does not induce ungrammaticality. It is thus quite plausible to attribute the acceptability of (3b) and (4b) to the existence of the other trace in the main clause, which licenses the gap in the adverbial clause. In other words, (3b) and (4b) look like so-called P-gap constructions.

However, whether P-gaps are indeed allowed in Chinese remains to be an issue. On the one hand, as will be discussed later, Xu (1990) claims that Chinese does not exhibit P-gaps because the empty category at issue is not subject to syntactic constraints imposed on P-gaps in general. According to him, the apparent P-gaps in Chinese are in fact what he calls a "free empty category", which, according to him, enjoys more freedom than the P-gaps in English. On the other hand, Tsai (1997) and Lin (2005) assume the existence of P-gaps in Chinese and discuss whether they can be licensed by *wh* in-situ phrases. Neither of them has studied the syntactic properties and distributions of Chinese P-gaps by making a complete comparison between P-gaps in English and Chinese. This paper, therefore, aims to achieve two goals. First, we would like to assert the existence of P-gaps in Chinese. Xu's arguments against P-gaps in Chinese will be brought into question. Second, we will examine properties of these P-gaps and provide a more comprehensive study of the P-gap construction in Chinese.

Discussion in this article will proceed by examining the empty category at issue in Chinese through the conditions which have been observed for P-gaps (Engdahl 1983, 1985, Chomsky 1982, 1986, and Kayne 1983, among others) and summarized by Culicover (2001) as Current Consensus Positions (CCP). These conditions include: first, the antecedent of a P-gap must be in an A' position; second, a P-gap is licensed only at the overt syntax; third, the true gap cannot c-command the P-gap, i.e. the anti-c-command condition; fourth, the antecedent of a P-gap must be an NP. Close examination of the P-gap in Chinese in light of these conditions reveals that it conforms largely to the CCP to be discussed in Sections 2, 3 and 4, and that some differences are possibly due to parametric differences between Chinese and English, to be discussed in Section 5. In a word**,** the P-gap in Chinese is licensed largely by the same principles provided in Universal Grammar as those in English.

2. Justifying the EC at issue as a variable

2.1 Locality effects

In the Principle and Parameter (PnP) approach, the P-gap in English is generally

regarded as a variable (Chomsky 1982, 1986, Engdahl 1983, 1985, Haegeman 1984, and Nissenbaum 1999, among others). This conclusion, however, cannot readily be generalized to the empty category represented as *e* within the adverbial clause in Chinese as in (3b). Various proposals have been made regarding this issue. For instance, Kim (2001:103) claims that the status of the EC at issue is difficult to determine in languages such as Chinese and Japanese because these languages permit "empty resumptive pronouns". That is, such an EC may be a P-gap or an empty pronoun. Xu (1990) claims that the EC in Chinese is a "free empty category", whose licensing does not rely on a real gap. In contrast to these proposals that cast doubt on the existence of P-gaps in Chinese, Lin (2005), claiming the existence of P-gaps in Chinese, dismisses the possibility of the EC being a *pro* by following Huang's (1984) proposal that there is no object *pro* in Chinese. In this section, we will verify the status of the EC at issue as a variable in two respects. We first argue against the EC at issue being pronominal on the grounds that it is subject to the Subjacency condition on a par with a variable, just like a regular P-gap in other languages. We then argue that the EC at issue does not occupy a True Empty Position, a position proposed by Li (2007a, b).

According to Chomsky (1986:55), the parasitic gap in English shows all of the typical island effects, as demonstrated by the examples in (5) (taken from Chomsky 1986:58). The island condition is observed in (5a) and (5b), where the movement only crosses one bounding node. In contrast, there are two bounding nodes in both (5c) and (5d), where the extraction of an element is rendered impossible. Given the contrast in (5), Chomsky concludes that parasitic gaps are traces left by null operator movement and thus that island conditions must be obeyed.

(5) a. He's a man that [anyone who talks to *e*] usually likes *t*.
   b. He's a man that [anyone who tells people to talk to *e*] usually likes *t*.
   c. *He's a man that [anyone who meets people who talk to *e*] usually likes *t*.
   d. *He's a man that [anyone who asks when to talk to *e*] usually likes *t*.

Turning to Chinese, we find that the EC at issue (i.e. e_2) also shows island effects. Consider the contrast between (6a) and (6b).

(6) a. [$_{CP} OP_1$ dajia   [$_{CP} OP_2$ zai zuojia xie-le e_2 zhihou] dou   mai e_1]
           everyone   at   writer write-ASP after   all   buy
      de   naben   shu
      DE   that.CL book
      'the book which everyone bought after the writer wrote it'

b. *[$_{CP}$ OP_1 [$_{CP}$ OP_2 zai zongtong [$_{CP}$ yinwei zuojia xie-le e_2]
                at president   because writer write-ASP

er xiatai yihou] dajia   dou mai e_1] de naben shu
so resign after   everybody all   buy   DE that.CL book

'the book which everyone bought after the President resigned because the writer wrote it'

In (6a), both A'-chains conform to island conditions and are thus grammatical; in (6b), however, the chain formed by the EC within the most embedded adjunct CP and its null operator antecedent does not conform to the Subjacency condition and is ungrammatical. This contrast thus shows that the EC at issue in Chinese behaves as a variable on a par with a regular P-gap in other languages.[2] This conclusion is further supported by the fact that the island contexts for the EC at issue may be remedied by hosting a pronominal in the gap. Pronominals, as generally agreed, are immune to island conditions and thus improve what would otherwise be a Subjacency violation. As shown by the contrast in (7), the occurrence of the pronoun *ta* 'he' in place of the gap at issue in (7b) indeed improves the acceptability of the example. This fact also renders implausible any analysis of the EC as a pronominal.

(7) a. *[[zai zhengfu   [yinwei *e* fancuo]   er   fakuan
          at   government because   make.mistake then impose.penalty

zhihou] laoban like   kaichu *t*] de nage   yuangong
after   boss immediately fire   DE that.CL employee

'the employee who the boss fired immediately after the government imposed a

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[2] Based on examples like (i), Xu (1990:458) argues that there is no P-gap in Chinese, because the EC at issue does not conform to the 0-subjacency condition on the P-gap in English which Chomsky (1986) proposes.

(i) zhebu   jiqi   [OP_1 faming e_1 de ren [OP_2 *pro* zao hao e_2 yiqian] yijing   si   le]
    this.CL machine   invent   DE person   make ASP   before   already die ASP
    'This machine, the man who had invented it died before someone made it.'

According to Xu, the real gap (i.e. e_1) is within a complex NP and thus the chain containing the real gap is not 0-subjacent to the chain containing the alleged P-gap (i.e. e_2), yielding a violation of the 0-subjacency condition on the generation of a P-gap construction. However, this account is problematic in that the example (i) does not necessarily have the structure indicated. Under the analysis of Huang, Li, and Li (to appear), there is no real trace left by topicalization out of the complex NP in examples like (i). According to them, the coindexation between the empty object (i.e. e_1) and the topic *zhebu jiqi* 'this machine' in (i) is made possible by a *pro* strategy available in Chinese (for details, the readers are referred to their work). The next question to address is then: how is the empty object within the adjunct clause licensed if there is no real gap in (i)? We claim that such an empty object is generated as a TEP, as will be discussed later in section 2.1. Supporting evidence comes from the well-formedness contrast between (i) and (ii), where the empty category coindexed with the topic within the adverbial clause is in a subject position within the adjunct clause.

(ii) *zhebu jiqi   [faming *e* de ren   [zai *e* chu   miaobing yiqian] yijing   si   le]
    this.CL machine invent   DE person at   happen problem before already die ASP
    'This machine, the man who had invented it died before it became problematic.'

penalty because he made a mistake'

  b. [[zai zhengfu   [yinwei *ta* fancuo]   er   fakuan
      at   government because he make.mistake then impose.penalty
    zhihou] laoban like   kaichu *t*] de nage   yuangong
    after   boss   immediately fire   DE that.CL employee
    'the employee who the boss fired immediately after the government imposed a
    penalty because he made a mistake'

The following examples, as pointed out by an anonymous reviewer, appear to suggest that the EC at issue is not a P-gap because its existence does not rely on a true gap in the clause.

(8) a. wo [zai laoshi tichu *e* de   shihou] da   bu   chu zhege   wenti
      I   at   teacher raise   DE time   answer not out this.CL question
      'I couldn't answer the question when the teacher raised it.'
  b. dajia   [zai zuojia xie-le   *e* zhihou] dou mai-le   naben   shu
      everyone at   writer write-ASP after   all   buy-ASP that.CL book
      'Everyone bought that book after the writer wrote it.'
  c. ni [jian-guo *e* zhihou] yongyuan bu   hui   wangji zhege   nanren
      you see-ASP   after   forever   not will forget this.CL man
      'You will never forget this man after you meet him.'

We argue that these are only apparent counter-examples because the empty elements in example (8) represent a different type of empty element, which Li (2007a, b) convincingly shows needs to be distinguished from the existing types such as NP trace, variable, PRO and *pro*. Crucially, such empty elements exhibit subject/object asymmetry in that only object, not subject, permits a reading supplied from the discourse/pragmatic context, as shown by the interpretation contrast in (9) (cf. The EC in subject position is subject to the Generalized Control Rule (GCR) proposed by Huang 1984).

(9) ta zhao-bu-dao yi-ge [[*e* bu   renshi *e*] de ren]   (Li 2007b:16, (41))
    he look-not-find one-CL   not know   DE person
    a. 'He$_1$ can't find a person$_2$ that does not know e_3.'
    b. '*He$_1$ can't find a person$_2$ that e_3 does not know e_2.'
    c. 'He$_1$ can't find a person$_2$ that (he$_1$) does not know e_2.'

According to Li (2007a, b), such empty elements represent a True Empty Position

(henceforth TEP), which is generated, as a last resort strategy, to fulfill the subcategorization requirement of a head. The TEP is "… interpreted at LF by the copying of the materials from a linguistic antecedent of the discourse/pragmatic context" (Li 2007a:39).[3] Given Li's proposal of recognizing a distinct class of empty elements from the existing types, we claim that the empty elements in the apparent counter-examples like (8) are such elements. We will show that the EC we argue to be a P-gap in Chinese cannot be analyzed as a TEP because they have different syntactic behaviors.

First, notice that the EC we argue to be a P-gap not only can occur in object position (3) but also can occur in subject position (4). This fact clearly distinguishes it from the TEP proposed by Li (2007a, b) because, under her analysis, the TEP is allowed only in object but not subject position. Furthermore, even when the EC at issue is in object position, it cannot be analyzed as involving a TEP. Recall that Li (2007a, b) proposes that the TEP is a last resort strategy; only when there is no empty category (pronoun or variable) to fill a position does this option come in to fill this position with some element from the context. If the EC at issue in object position is allowed to be derived by A'-movement as we propose, then it cannot be generated by the strategy of the TEP. Given the discussion above, we conclude that recognizing the TEP in examples in (8) does not jeopardize our analysis of the EC in examples like (3) and (4) as P-gaps in Chinese.

In brief, based on the fact that the EC at issue in Chinese is also subject to island conditions just like a regular P-gap in other languages, we conclude that it is a variable.[4]

2.2 Antecedent of a P-gap not in an A position

Following Chomsky (1982), Engdahl (1983) suggests that the antecedent of a P-gap must participate in an unbounded dependency introduced by A'-movement, either overt as in the case of *wh*-questions (1), or involving empty operators, as in the *tough* construction (10).

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[3] It is necessary to note that it suffices for us to recognize a different type of empty elements from the existing types and that our analysis of the P-gap in Chinese does not hinge on the specific analysis of this distinct class of empty elements proposed by Li.

[4] Interpreting gaps seems to be easier than interpreting pronouns in terms of sentence processing (cf. Engdahl 1984). When a listener hears a pronoun, he presumably either searches his discourse model for a likely referent or enters a new referent. On the other hand, a gap must be interpreted as controlled by a displaced constituent in the sentence and the listener must not go outside the sentence to find a referent. By creating a gap on purpose, the speaker effectively prevents the hearer from computing a possible but unintended interpretation for the sentence, and induces the hearer to establish a filler-gap dependency within the sentence. In most languages, the filler-gap assignment is uniquely determined by implicit syntactic rules. This seems to hold true in Chinese as well.

(10)   These papers were hard for us [*OP* PRO to file *t*] without reading *pg*.

According to her, crucially, NP movement as in passives (11a) or in Raising to Subject (11b) does not license P-gaps.

(11)   a. *John was killed *t* by a tree falling on *pg*.
        b. *Mary seemed *t* to disapprove of John's talking to *pg*.

    There is no doubt that P-gaps in Chinese can be licensed by A'-movement, such as relativization (12a) and topicalization (12b).

(12)   a. yige [[ni   jian-guo *pg* zhihou] yongyuan bu   hui wangji *t* de] nanren
            one.CL you see-ASP   after   forever not will forget   DE man
            'a man who you will never forget after seeing'
        b. zhege   ren,   [[ni   jian-guo *pg* zhihou] yongyuan bu   hui   wangji *t*]
            this.CL person   you jian-guo *pg* zhihou   forever not will forget
            this.CL person   you see-ASP   after   forever not will forget
            'This man, you will never forget after seeing.'

The question to be addressed is: can P-gaps in Chinese be licensed by an antecedent derived by A-movement? Xu (1990) argues that the EC at issue can be licensed by A-movement and is thus not a P-gap.

(13)   a. naben   shu [du   wan   *e* yiqian] yijing   bei   ta   huan   le   *t*.
            that.CL book read ASP   before already   BEI   he   return ASP
            'That book was already returned by him before being read.'
        b. nage   ren [wo   qu   jiu   *e* yiqian] yijing   bei ren   sha   le   *t*.
            that.CL man I   go   rescue   before already BEI man   kill ASP
            'That man was already killed before I went to rescue (him).'

According to Xu, the EC inside the adjunct clause is licensed by NP-movement in passives (13) and does not behave on a par with a regular P-gap in other languages, which is licensed by A'-movement. He thus concludes that such an EC should not be treated as a parasitic gap.
    A serious challenge to Xu's analysis is that he assumes that long passives (i.e. passives with overt logical subject), as in his example in (13), are derived by A-movement. However, more recently it has been proposed by Ting (1998) and Huang (1999), among others, that only short passives (i.e. passives without overt logical subject) as in (14a) are derived by A-movement, and that long passives as in

(14b) are derived by A'-movement.

(14) a. [Zhangsan_i bei [_{VP} PRO piping-le t_i]].
      Zhangsan BEI   criticize-ASP
      'Zhangsan was criticized.'
   b. [Zhangsan_i bei [_{IP} *Op*_i [_{IP} Lisi   piping-le t_i]].
      Zhangsan BEI   Lisi criticize-ASP
      'Zhangsan was criticized by Lisi.'

Bei in the short passive in (14a) selects a VP as its complement. This VP does not have an external argument and no Case is assigned to its object, by virtue of the [passive] feature on V. The object of *piping* 'criticize' hence moves to [Spec, VP], where it is controlled by the subject of *bei*. On the other hand, *bei* in the long passive (14b) selects an infinitival IP clause as its internal argument and an NP as external argument. There is a null operator movement from the complement position of the embedded verb *piping* 'criticize' to an IP-adjoined position. Under this analysis, to test whether passivization in Chinese licenses P-gaps, we need to examine examples like the following:

(15) a. nage   xiaotou bei [_{IP} *Op* [jingcha [zai jianchaguan zhenxun   *e* hou]
      that.CL thief   BEI   police at DA   interrogate   after
      daibu-le   *t*]
      arrest-ASP
      'That thief was arrested by the police after the DA interrogated him.'
   b. *nage   xiaotou bei [_{VP} PRO turan   [zai jianchaguan zhenxun   *e* hou]
      that.CL thief   BEI   suddenly at DA   interrogate   after
      daibu-le   *t*]
      arrest-ASP
      'That thief was suddenly arrested after the DA interrogated him.'

The acceptability contrast in (15) supports the analysis that P-gaps in Chinese are licensed by A'-movement but not A-movement. As shown in (15a), null operator movement in the long passive licenses the EC at issue in the adjunct clause, whereas A-movement of PRO in the short passive does not.

    Now when we turn to Xu's examples in (13), a question immediately arises how the embedded EC is licensed, if not by passivization. One possibility is that given that an adjunct clause may either precede or follow the subject in Chinese, the sentence-initial NPs in passives similar to (13), with or without a logical subject, are

derived by further movement to a topic position from a grammatical subject position as shown in (16). Under our analysis, it is the A'-chain that licenses the P-gaps.

(16) a. naben shu$_i$ [du   wan e yiqian] t_i yijing   bei (ta) huan   le t_i
        that.CL book read ASP   before   already BEI he return ASP
        'That book was already returned (by him) before reading.'
    b. nage   ren$_i$ [wo qu jiu e yiqian] t_i yijing bei (ren)   sha le t_i
        that.CL person I go rescue   before   already BEI person kill ASP
        'That person was already killed (by people) before I went to rescue him.'

It is necessary to note that the EC at issue in *bei* sentences similar to Xu's examples in (13) could be derived by the strategy of the TEP when the topicalization option fails, as evidenced by the well-formed example in (17).

(17) henshao renzhi$_i$ [zai jingchaqu jiu e yiqian] hui bei (ren)   shifang t_i
    few   hostage   at police go rescue   before will BEI   person release
    'Few hostages will be released before the police went to rescue them.'

The sentence initial nominal *henshao renzhi* 'few hostages' cannot be in a topic position because as pointed out by Ko (2005), such phrases cannot undergo movement, in contrast to phrases like *meigeren* 'everyone', as shown by (18), taken from Tsai (2007).

(18) a. meige   ren$_i$,   wo renwei [t_i dou   hui   qu]
        every.CL person I   think   all   will go
        'Everyone, I think will go.'
    b. *henshao ren$_i$,   wo renwei [t_i hui   qu]
        few   person I   think   will   go
        'Few people, I think will go.'

The EC in the adjunct clause in (17), therefore, cannot be licensed by topicalization. Neither is the EC at issue licensed as a *pro*, given the GCR proposed by Huang (1984). Adopting Ting's (1998) and Huang's (1999) analysis for Chinese *bei* passives, as argued above, passivization does not license a P-gap in such sentences. Given the last resort nature of a TEP in the object position discussed in Section 2.1, we conclude that the only way left to license the EC at issue in (19) is generating a TEP.[5]

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[5] Examples like (17), which were brought to our attention by one of the editors, contrast with examples like (i) in terms of acceptability.

   This topicalization analysis also applies to another type of construction which is associated with A-movement, namely, Raising to Subject. As shown in (19), the raising construction appears to license a P-gap in Chinese.

(19) nage   jihua$_i$ [zai Lisi   choubei *pg* zhihou] kaishi jinxing t_i
      that.CL plan   at Lisi plan   after   begin   proceed
      'That plan began to proceed after Lisi planned it.'

The verb *kaishi* 'begin' is generally assumed to be a raising verb in Chinese because it has no selectional restrictions on its subject and does not assign a θ-role to the subject (e.g. Teng 1978 and Li 1990). Under our topicalization approach, the P-gap is actually licensed by the A'-movement from the grammatical subject position to the topic position rather than by A-movement from the complement position to the grammatical subject position in one fell swoop. In other words, the sentence in (19) should have a structure as in (20) where *nage jihua* 'that plan' is raised from the complement position to the subject position in the first step and then moves to the topic position subsequently. It is the second step that licenses a P-gap.

(20) nage   jihua$_i$ [zai Lisi   choubei *pg* zhihou] t_i kaishi   jinxing t_i.
      that.CL plan   at Lisi plan   after   begin   proceed
      'That plan began to proceed after Lisi planned it.'

   In brief, we conclude that just like in English, only A'-movement can license P-gaps in Chinese.

3. P-gap licensed only by overt syntactic movement

   In this section, we examine whether Chinese exhibits another property of a P-gap in general, namely being licensed by overt syntactic movement. As shown in the English contrast (21), a *wh* in-situ phrase does not license a P-gap, which suggests that it is at overt syntax where P-gaps are licensed, not LF.

   (i) *henshao ren$_i$ [jingcha qu jiu   *e* yiqian] t_i yijing bei (ren)   sha le t_i
          few   police go rescue   before   already BEI person kill ASP
         'Few people were already killed (by people) before the police went to rescue them.'
          Notice that such sentences sound odd even without the adverbial clause as in (ii).
   (ii) *henshao ren   yijing   bei (ren)   sha le
          few   person already BEI person kill ASP
         'Few people were already killed (by people).'
   We thus consider that unacceptability of sentences like (i) is independent of licensing of the EC within the adverbial clause.

(21)   a. *John filed which articles without reading *e*.
　　　b. *I forget who filed which articles without reading *e*.　　　(Engdhal 1983)

　　Lin (2005) has convincingly shown that in Chinese, a *wh* in-situ does not license P-gaps and that only overt *wh*-movement may do so. A crucial argument is based on the fact that 'topicalization of *wh*-elements in Chinese always involves syntactic *wh*-movement, as island effects typically show up.' (Lin 2005:300). This is illustrated in (22) (=Lin's (4)).

(22)   a. shenme yu$_i$, Laowang　xihuan　t_i?
　　　　what　　fish Laowang　like
　　　　'What fish does Laowang Like?'
　　b. *shenme yu$_i$, Laowang　yu-guo　　[e_j xihuan　e_i　de]　ren$_j$?
　　　　what　　fish Laowang　meet-ASP　　like　　　DE　　person
　　　　'What fish is it such that Laowang met persons who like it?'

As shown by the acceptability of the examples in (23), P-gaps are licensed by syntactic movement of *wh*-words.

(23)   a. shei$_i$ Laowang [zai huijian　pg_i　zhiqian] jiu　　　kaichu-le　e_i ?
　　　　who Laowang　at　meet　　　before　　already　fire-ASP
　　　　'Which person is it who Laowang fired before meeting?'
　　b. sheme wenjian$_i$　Laowang [zai du-guo　pg_i　zhihou] jiu　　diudiao-le　e_i?
　　　　what　document Laowang　at　read-ASP　　after　　then　throw-ASP
　　　　'Which document is it that Laowang threw away right after reading?'

In contrast, in-situ *wh*-words do not license P-gaps, as shown in (24).

(24)   a. *Laowang [zai huijian　pg_i zhiqian] jiu　　　kaichu-le　shei$_i$?
　　　　Laowang　at　meet　　　before　already　fire-ASP　who
　　　　'Who did Laowang fire before meeting?'
　　b. *Laowang [zai du-guo　　pg_i zhihou] jiu　diudiao-le　sheme wenjian$_i$?
　　　　Laowang　at　read-ASP　　after　　then throw-ASP　what　document
　　　　'Which document did Laowang throw away right after reading?'

The acceptability contrast between (23) and (24) suggests that P-gaps in Chinese are licensed by overt syntactic movement, just as those in other languages such as English.

A different proposal, on the other hand, has been provided by Tsai (1997). He claims that while a non-D-linked *wh* in-situ cannot license a P-gap in Chinese (25a), a D-linked *wh* in-situ can (25b).

(25) a. Akiu [jian-ye-mei-jian e_i] jiu   gu-le   nayige   ren$_i$?
          A.Q   without.interviewing   immediately hire-ASP which.CL person
          'Which person did A-Q hire immediately without interviewing?'
      b. *Akiu   [jian-ye-mei-jian e_i] jiu   gu-le   sheme   ren$_i$?
          A.Q   without.interviewing   immediately hire-ASP what   person
          'Who did A-Q hire immediately without interviewing?'

Under Tsai's analysis, there is a [+Q] null operator base-generated in the matrix Comp of a D-linked *wh*-phrase such as *nayige ren* 'which person', but there is no such operator for its non-D-linked counterpart *sheme ren* 'what person'. As a result, the P-gap is licensed by the Q-operator, as illustrated below:

(26) Topic, [Op_i [+Q] [Akiu [jian-ye-mei-jian e_i] jiu   gu-le
                    A.Q without.interviewing   immediately hire-ASP

      [nayige   ren]$_i$]]?
        which   person
      'Which person did A-Q hire immediately without interviewing?'

Of the two conflicting views on whether *wh* in-situ phrases in Chinese can license a P-gap, we side with Lin's analysis rather than with Tsai's. That is, we contend that a *wh* in-situ, either D-linked or non-D-linked, does not license a P-gap in Chinese. First of all, there is no sharp contrast between the acceptability of (25a) and (25b); both are equally acceptable. This judgment can be further supported by the fact that even if the *wh*-phrase is replaced with an even more non-D-linked *wh*-word *shei* 'who', the sentence does not degrade in its grammaticality, as in (27).

(27) Akiu   [jian-ye-mei-jian e_i] jiu   gu-le   shei$_i$?
      A.Q   without.interviewing   immediately hire-ASP   who
      'Who did A-Q hire immediately without interviewing?'

In addition, if Tsai's observation is correct, (28) is expected to be also good, since it contains a D-linked *wh* in-situ *nayige ren* 'which person', which is capable of licensing a P-gap. However, this prediction is not verified. (28) is at best marginal if the EC is co-indexed with the *wh*-phrase.

(28) *Akiu [zai jian-guo e_i zhihuo] jiu   gu-le   nayige   ren$_i$?
     A.Q at interview-ASP   after   immediately hire-ASP which.CL person
     'Which person did A-Q hire immediately after interviewing?'

Given these inadequacies with Tsai's account, we conclude that in-situ *wh* phrases, D-linked or non-D-linked, do not license P-gaps. Still, the contrast between (28) and the acceptable (25a) observed by Tsai, repeated here, requires an explanation.

(25) a. Akiu   [jian-ye-mei-jian e_i] jiu   gu-le   nayige   ren$_i$?
        A.Q   without.interviewing   immediately hire-ASP which.CL   person
        'Which person did A-Q hire immediately without interviewing?'

As pointed out by one of the anonymous reviewers, the V-*ye-mei*-V *jiu* construction in examples like (25a) can be analyzed as involving Right Node Raising (RNR) effects, with *jiu* analyzed as a coordinator. RNR is an operation of reduction on coordinated clauses whose rightmost constituents are identical (Postal 1974). One way of implementing this operation is to derive the structure in (29b) from the underlying structure in (29a) by adjoining one copy of the identical constituents (*the book*) to the right of the sentence, and deleting the identical originals (indicated by *e*).

(29) a. [[John saw the book] and [Bill bought the book]]
      b. [[John saw e_i] and [Bill bought e_i]] the book$_i$

Given this RNR account, the contrast between (28) and (25a) is due to the fact that the former can be analyzed as a coordinating sentence but the latter can only involve a subordinating structure. This analysis is supported by the possibility of having an independent sentence based on the *jian-ye-mei*-V construction but not based on the *zai…zhihou* construction as shown in (30).

(30) a. Zhangsan jian-ye-mei-jian   nage   ren.
        Zhangsan without.interviewing that.CL man
        'Zhangsan didn't interview that man at all.'
     b. *Zhangsan zai jian-guo   nage   ren   zhihou
         Zhangsan at interview-ASP that.CL man   after
        'after Zhangsan met that man'

It is necessary to note that Lin's examples like those in (24) all involve an EC in object position. One may wonder whether they are unacceptable due to some

constraints on content recovery imposed on the TEP[6] but not due to the ban on *wh* in-situ as licensers for P-gaps under our analysis. To show that such concerns about the TEP are irrelevant here, consider examples like (31).

(31) *laoban [zai e_i huijan Zhangsan zhihou] jiu kaichu-le shei$_i$/nayige
       boss   at   meet   Zhangsan after   then fire-ASP   who/which.CL
      ren$_i$
      man
      'Who/which man did the boss fire after he met Zhangsan?'

In (31), the EC is in subject position and cannot represent a TEC under Li's theory. Therefore, the unacceptability of examples like (31) cannot be due to any constraint on the licensing of the TEP. Moreover, the fact that the EC in (31) cannot be licensed as a P-gap by the *wh* in-situ phrase further supports our proposal that P-gaps in Chinese are only licensed by overt syntactic movement.[7]

If our analysis is correct, the claim made by Tsai that a D-linked *wh* in-situ phrase can license a parasitic gap in Chinese does not hold. We conclude, concurring with Lin (2005), that the P-gap is licensed only by overt A'-movement.

4. True gap not c-commanding the P-gap

Another well-known characteristic of P-gaps is the so-called anti-c-command condition. That is, the true gap cannot c-command the P-gap (Chomsky 1982 and Engdahl 1983, 1985) as shown by the contrast between (32) and (33), taken from Engdahl (1983).

(32) a. Which articles [*t* got filed by John [ADVP without him reading *pg/them?]]
      b. Who *t* sent a picture of *pg/himself?
      c. Who *t* remembered that John talked to *pg/him?
(33) a. Which Caesar did Brutus imply [*t* was no good] [ADVP while ostensibly
         praising *pg*?]
      b. Who did you say John's criticism of *pg* would make us think *t* was stupid?

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[6] Under the theory of Li (2007a, b), the empty elements in (24) should qualify as representing the TEP because they fulfill the subcategorization requirement of the verbal head. One way to rule them out under the theory of Li (2007a, b), as we see it, is to resort to the constraints on recovery of the content of these empty positions because for interpretation, some materials from the discourse/pragmatic context must be copied at LF to fill in this empty position. This part of theory, however, is yet to be spelled out under Li's analysis.

[7] The EC, however, can be a *pro* and interpreted as its closest c-commanding NP *laoban* 'the boss' based on the GCR.

The difference between sentences (32) and (33) lies in the structural relations between the real gap and the P-gap. In the former, the real gap c-commands the P-gap, while in the latter the real gap does not.

When we turn to Chinese, does the proposed P-gap construction exhibit this defining property of P-gaps? The answer is positive, as shown by the examples in (34).

(34) a. nage   [t_i yiwei   [laoban xiang   kaichu ta /*pg]] de   yuangong$_i$
       that.CL   thought boss   want   fire   him   DE   employee
       'the employee who thought the boss wanted to fire him'

     b. Zhangsan$_i$ kaishi t_i xihuan   [bieren   tanlun   ta /*pg].
       Zhangsan   begin   enjoy   others   talk.about   him
       'Zhangsan begins to enjoy others' talking about him.'

In (34), the P-gap is c-commanded by the true gap in the subject position. This violates the anti-c-command condition and thus results in ungrammaticality. This anti-c-command condition has been argued to follow from the variable status of the P-gap (Engdahl 1983 and Chomsky 1986). As a variable, it cannot be bound by an element in an argument position. If the true gap, which is always in an argument position, c-commands the P-gap, it will A-bind the P-gap, in violation of Binding Condition C. The degradedness of these sentences would be prevented by replacing the gap with an overt pronoun because the pronoun is free in its governing category, satisfying Binding Principle B.

The claim that the EC at issue in Chinese is subject to the anti-c-command requirement and is thus a P-gap may be challenged by examples such as (35) if they have the structure as indicated.

(35) yige   [t_i [yisheng   zhiliao e_i zhihou] jiu   likai] de   bingren
      one.CL   doctor   treat   after   then   leave DE   patient
      'a patient who left after the doctor treated him'

In the indicated structure of (35), the real gap, in the subject position of the relative clause, c-commands the EC in the adjunct clause. However, note that Chinese allows an adverbial clause to precede or follow the grammatical subject. As pointed out by Huang (1989:199), "in Chinese, except for resultative clauses, adverbial clauses occur most naturally in sentence-initial position,…, a view consistent with the fact that Chinese is basically a head-final language." Therefore, the underlying representation

of such examples does not have to be like that in (35) but rather in (36).[8]

(36) yige   [[yisheng zhiliao e_i zhihou] t_i jiu   likai] de bingren
      one.CL   doctor treat   after   then leave DE patient
      'a patient who left after the doctor treated him'

A similar situation also holds in English. Observe the contrast between (37a) and (37b), pointed out by Haegeman (1984).

(37)   a. *This is a note which [t_i will ruin our relationship [unless we send pg_i back.]]
       b. This is a note$_i$ which, [unless we get pg_i back], [t_i will ruin our relationship.]

In English, the trace of a subject NP will never be able to license a parasitic gap contained in a sentence-final adverbial clause, since it c-commands everything in S, as in (37a). However, the sentence can survive with the parasitic gap if the adverbial clause is preposed to a pre-subject position, as in (37b). Haegeman argues that P-gaps may be licensed by subject traces as well as by object traces. In the case of subject traces licensing P-gaps, the adverbial clause always precedes the matrix clause in order for the P-gap to be subject to the anti-c-command condition. On the other hand, in the case of object traces licensing P-gaps, the adverbial clause may either precede or follow the matrix clause. Following the same line of reasoning, we consider that examples like (35) do not pose problems for our claim of P-gaps in Chinese being subject to the anti-c-command condition because, as indicated in the structure of (36), with the adverbial clause occupying a position higher than the matrix clause, the anti-c-command condition is respected.

Summarizing, based on the discussions in this section, we conclude that the P-gap construction in Chinese behaves similarly to that in English. First, we justified the EC at issue as a variable by showing that it is subject to the Subjacency condition on a par with a variable and thus cannot be a *pro* or represent a TEP. Then we showed that the antecedent of the EC must be in an A'-position and thus the EC cannot be licensed by A-movement. Some apparent counter-examples are argued to be reanalyzed as

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[8] This alternative structure is in fact recognized by Xu (1990:459), as in (ia), when he argues that the EC at issue is not a P-gap because it is not subject to the anti-c-command condition. However, he claims that there is no independent reason to exclude the structure indicated in (ib) and thus dismisses the structure in (ia). We do not agree with this claim, because the well-formed structure in (ia) will suffice to yield acceptable output.
(i)   a. [ta   mai xia e_i yiqian] [t_i yijing   huai le   de] jiqi$_i$
           he buy ASP   before   already break ASP MM machine
         'the machine which had broken before he bought it'
      b. [t_i [ta mai xia e_i yiqian] yijing   huai le   de] jiqi$_i$
              he buy ASP   before   already break ASP MM machine

sentences involving either topicalization or generating of a TEP. Second, the P-gap is licensed only by overt syntactic movement. Regarding some instances which seemingly contain a P-gap licensed by a *wh* in-situ phrase, we argued that the EC at issue is not a P-gap possibly because it appears in coordinating structures involving Right Node Raising (RNR) effects. Third, the true gap can never c-command the P-gap. When the true gap c-commands the position of a P-gap, an overt pronoun has to fill in the position to avoid unacceptability.

5. Differences between P-gaps in Chinese and English

In this section, three observed differences between P-gaps in Chinese and English are discussed. First of all, although English only allows P-gaps licensed by NP-categories, those in Chinese may be licensed by non-NP categories. Furthermore, extraction from the subject position is fine for P-gaps in Chinese but not for those in English. Chinese P-gaps also differ from those in English in that the so-called tensedness effect in English does not show up in Chinese.

We now examine the category of the antecedent of the P-gap in Chinese. Cinque (1990) claims that only NP can be the antecedent of a P-gap. Supporting evidence comes from Italian: as opposed to the well-formed NP extractions with P-gaps, PP, AP and VP extractions with P-gaps are ill-formed, as shown in examples in (38).

(38)   a. *[AP Quanto importanti] si   può diventare   *t* [senza   sentirsi *pg*]
               how   important   can one become   without feeling
           'How important can one become without feeling (how important he is)?'
       b. *[PP A chi]   hai   lasciato la lettera *t* [dopo esserti   rivolto *pg*]
               to whom did.you leave   the letter   after to.be.REFL returned
           'To whom did you leave the letter after it was returned (to him)?'
       c. *[VP Venuto a casa] era   *t* [senza   che   fosse   *pg* suo padre]
               came   home he.was   without that he.was   his   father
           'He had come home without his father having (done so).'

According to Postal (1993, 1994), such a contrast in terms of category of the antecedent of a P-gap observed by Cinque in Italian also holds in English. For example, an NP-gap as in (39a) is fine, but an adverbial gap as in (39b) is impossible.

(39)   a. What city did Elaine work in *t* without ever living in *pg*?
       b. *Where did Elaine work *t* without ever living *pg*?

On the other hand, Engdahl (1983) observes that in addition to NPs, Swedish P-gaps can have PPs (40a) and APs (40b) as antecedents.

(40) a. [PP Till hilmlen] är det inte säkert att [NP alla   [S' som längstar

        to   heaven is it not certain that   everyone that longs

    [PP *pg*]]] kommer [PP *t*]

          gets

    '*To heaven, it is not certain that everyone who longs (there) gets.'

  b. [AP Fattig] vill [NP ingen [S' som nagonsin varit [AP *pg*]]] bli   [AP *t*] igen.

      poor   wants no.one who ever   been   become   again

    '*No one who has ever been poor wants to become poor again.'

According to Engdahl's analysis, the fronted phrases in (40) are complements of the verb, not modifiers.

    Given the fact that not only NPs can be the antecedent of P-gaps in some languages, what is the case in Chinese? Do P-gaps in Chinese only have NP antecedents on a par with English and Italian, or can they have non-NPs as antecedents, on a par with Swedish? The most likely candidate for a PP complement as the antecedent of a P-gap in Chinese involves predicates such as placement verbs *fang* 'put', *bai* 'place', *gua* 'hang', *tie* 'paste', *pu* 'spread' or 'pave', which are generally considered to be three-place predicates (e.g. Gu 1999, cf. Zhu 1982).[9] The argument structure of such predicates is proposed to be <agent, theme, location>, as exemplified in (41a) and (41b).

(41) a. ta fang-le [NP yiben   shu] [PP zai   zhuo-shang]

    he put-ASP   one.CL book   at   desk-top

    'He put a book on the desk.'

  b. ta bai-le   [NP yi ping hua] [PP zai zhuo-shang]

    he place-ASP   one vase flower   at table-top

    'He placed a vase of flowers on the table.'

Under the three-place predicate approach, the example in (42) shows that a fronted complement PP is capable of licensing a P-gap inside the adjunct phrase.

(42) zai zhuo-shang, ta [bai yi ping hua   *e* zhiqian]

    at   desk-top   he place one vase flower   before

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9 With thanks to one of the reviewers for pointing out the work of Zhu to us.

xian   pu-le   yikuai zhuojin   *t*

first   spread-ASP   one.CL table.cloth

'On the desk, he spread a piece of table cloth before placing a vase of flowers on it.'

This fact thus indicates that Chinese P-gaps, unlike those in English and Italian, can be licensed by non-NP categories and behave more like those in Swedish.[10]

We shall now turn to another difference between P-gaps in Chinese and English. Consider the contrast between (43a) and (43b).

(43)   a. *a girl who nobody saw *t* again after *pg* disappearing

      b. yige   [laoban [zai *pg* fancuo   zhihou] like   kaichu *t*] de

         one.CL boss   at   make.mistake   after   immediately fire   DE

         yuangong

         employee

         'an employee who the boss fired immediately after he made a mistake'

Although a P-gap cannot appear in a subject position in English as in (43a), a P-gap in Chinese is fine in the subject position as in (43b).[11]

A possible explanation for the ungrammaticality of an English P-gap in the subject position is violation of the ECP (Munn 1992). According to the Empty Category Principle, every trace must be properly governed (Chomsky 1986). The ungrammaticality of a P-gap in subject position can be analyzed on a par with *that-t* violations, where *after*, the head of CP, blocks the trace left by the null operator movement from being antecedent-governed, as illustrated in (44):

(44)   [$_{CP}$ *OP*$_i$ after [$_{IP}$ *t*$_i$…]]

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[10] Notice that the contrast between (ia) and (ib) below does not show that only an NP P-gap and not a PP P-gap is allowed in Chinese because a goal phrase associated with three-place predicates such as *ji* 'send', *song* 'give', *chuan* 'pass on' and *mai* 'sell' cannot be dislocated as shown in (ii).

(i) a. zhebu   che, ta [jie   *pg* gei Zhangsan zhiqian] xian jie   *t* gei Lisi

     this.CL car he   lend   to Zhangsan before first lend   to Lisi

     'This car, he lent to Lisi first before lending to Zhangsan.'

  b. *gei wo, ta [song-le   yiben   shu *pg* zhihou] you   song-le   hua   *t*

     to me   he   give-ASP one.CL book   after   again give-ASP flower

     'To me, he gave flowers after giving a book.'

(ii) * gei wo, ta song-le   hua   *t*

    to me   he give-ASP flower

    'To me, he gave flowers.'

[11] The EC in the adjunct clause cannot be a *pro* because according to the GCR proposed by Huang (1984), it would be co-indexed with the closest c-commanding NP, namely the matrix subject *laoban* 'boss', resulting in an incorrect interpretation.

Under this ECP approach, the fact that the P-gap in Chinese is allowed in the subject position naturally follows if we adopt Perlmutter's (1971) observation that languages permitting empty subject pronominals lack *that-t* violations. This is because Chinese, a typical *pro*-drop language, does not exhibit *that-t* effects. The contrast between licensing the P-gap in the subject position thus lends further support to our analysis of P-gaps as variables in Chinese. The fact that P-gaps in Chinese, unlike the restricted positions of P-gaps in English, appear freely either in the subject or object position, is now attributed to a parametric difference between Chinese and English.

A third difference between P-gaps in English and in Chinese is that a so-called tensedness effect exists in the former but does not seem to exist in the latter. That is, licensing of P-gaps is sensitive to the tensedness of the adverbial clause containing the P-gap in English but not in Chinese. According to Engdahl's "accessibility hierarchy" for English P-gaps, untensed domains are in general preferable to tensed domains, as shown in (45).

(45) a. Which articles$_i$ did John file t_i without reading pg_i?   (Engdahl 1983:5, (1))
      b. (?)? Who$_i$ did you talk to t_i when you first met pg_i? (Culicover 2001:8, (17))
      c. *This book, it would be stupid to give t_i to someone who has already read pg_i.
                                                                    (Engdahl 1983:11, (22))

In contrast, assuming that a clause with an overt subject in Chinese is a tensed clause, the P-gap in Chinese seems to be allowed in tensed clauses.

(46) yige   [[laoshi   tichu pg zhihou] wo bu hui huida t] de   wenti
      one.CL teacher raise   after   I not can answer   DE question
      'a question which I couldn't answer when the teacher raised it'

Given the description provided by Engdahl, this means that Chinese is not sensitive to the accessibility hierarchy. Several possible accounts may be proposed for the tensedness contrast between P-gaps in Chinese and in English. For example, Chinese may not have a distinction between tensed and infinitive clauses, as argued by Hu et al. (2001). Alternatively, Chinese may allow adverbial clauses to be generated on a par with absolute participial constructions in English, thus being untensed. We will leave the ultimate analysis of this licensing asymmetry for future study.

6. Concluding remarks

In this article, we have presented an overview of the P-gap construction in

Chinese. We justified the status of the EC at issue in Chinese as a variable by showing that it is subject to the Subjacency condition on a par with a variable and cannot be an empty pronominal or represent the TEP, and furthermore that this trace cannot be left by A-movement. In addition, the EC at issue is subject to the anti-c-command condition, a fact which follows from the analysis of a P-gap that as a variable, the EC should conform to the Binding Principle C.

Summarizing the similarities between P-gaps in Chinese and English, they are (1) the P-gap is subject to Subjacency condition, (2) the antecedent of a P-gap must be in an A'-position; (3) the P-gap is licensed only by overt syntactic movement; and (4) the true gap cannot c-command the P-gap. These similarities show that P-gaps in Chinese are licensed largely by the same principles as those in English. Differences, nevertheless, exist in three respects. First, the antecedent of a P-gap in Chinese can be a non-NP category. Second, the P-gap in Chinese is allowed not only in the object position but also in the subject position, in contrast to the distribution of the P-gap in English, which is limited to the object position. If such subject/object asymmetry in licensing P-gaps in English is due to the ECP, then the lack of *that-t* effects on the P-gap in the subject position in Chinese may be attributed to Chinese being a subject *pro*-drop language. Third, the tensedness effect is observed for licensing P-gaps in English but not in Chinese. Although P-gaps are preferable in an untensed domain in English, there is no such contrast in Chinese. An ultimate analysis of this licensing asymmetry will require re-examination of the clause structure in Chinese.

There are several issues that require further research. For example, as a missing part in Kim (2001), can multiple quantifications at LF be compatible with Chinese P-gaps? Also, are there obligatory and optional P-gaps in Chinese? What makes them different? In this respect, the acceptability judgments between sentences with pronouns and parasitic gaps require further investigation. It would be desirable for our analysis if a large-scale survey on speaker's acceptability and interpretation of sentences with parasitic gaps or pronouns is to be conducted. Last but not least, since P-gaps and pronouns are not in complementary distribution in some contexts, their licensing may be driven by other factors, such as processing, discourse or pragmatic considerations. The interaction between syntax and these factors proves to be an interesting issue for further research.

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論中文寄生空位結構

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　　自 Engdahl (1983)的研究開始,寄生空位結構即在學界引發廣泛的討論。我們主張儘管中文允許空主語存在,本文所探討的空位(gap)並不是空代詞,亦不是 Li (2007a, b)所提出的真空位置(TEP),而是一個變項(variable)。本文所提出的論點不僅證明中文寄生空位的確存在,在經過嚴密的檢視比較後更發現,若根據 Culicover (2001)針對英文寄生空位結構所歸納出的幾項共識來看,中文和英文的寄生空位結構其實呈現出相當大的相似性。至於其中一些不同之處,可能是由於中文與英文之間某些參數差異(parametric differences)所造成。一言以蔽之,中文的寄生空位結構如同英文,亦為普遍語法(universal grammar)的原則所認可。

關鍵詞:寄生空位結構、空代詞、真空位置、變項