



## Sluicing, Sprouting and Missing Objects

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### Abstract

Taking “sluicing” to be derived by movement + deletion, as represented by Merchant (2001), and “pseudo-sluicing” to be a base-generated structure [*pro* (+*be*) + *wh*] (going by Wei 2004; Adams 2004), this paper reviews arguments for and against the presence of a sluicing construction in Mandarin Chinese. We show that all the tests available in the literature do not argue against the presence of such a sluicing construction, except the test building on the distribution of the copula *shi*. Unfortunately, the *shi* test is demonstrated to be uncertain and it cannot be used to argue conclusively that only a base-generation pseudo-sluicing analysis should be adopted. We show that a much clearer evidence for an exclusive pseudo-sluicing analysis comes from the behavior of the sprouting construction. Investigation of sprouting also sheds light on the properties of null arguments, topic-variable relation, locality, and subcategorization of verbs in the language.

### Keywords

sprouting, sluicing, pseudo-sluicing, topic, variable

## 1. Introduction

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

- (1) a. John saw Mary somewhere, but I don't know where.  
 b. Jack resigned, but I don't know why.

The second part of the examples in (1a–b) has the interpretation equivalent to [but I don't know where John saw Mary] and [but I don't know why Jack resigned], respectively. Sluicing has been an important construction to show what is not seen or heard can still be syntactically active, which has been extensively demonstrated and accounted for by influential proposals such as Merchant's (2001) movement + PF deletion approach. The embedded clause in an English sentence like (1a) or (1b) is derived by moving a *wh*-phrase to the clause-periphery position, exactly in the way a *wh*-question is formed in this language. The IP following the moved *wh*-phrase is simply left unpronounced (PF deletion). Such an approach leads to the question of what happens in *wh-in-situ* languages. Linguists working on Mandarin Chinese (hereafter Chinese) have made important contributions to this discussion. Arguments have been advanced from the two logically possible positions. One is to claim that sluicing also exists in Chinese and similar movement + deletion operations are at work. The other is to deny that Chinese has a counterpart of English sluicing. Instead, it has a base-generated pseudo-sluicing structure containing a *pro* subject and a copular verb 'be' [*pro* + *be* + *wh*], with 'be' missing in some cases.<sup>1</sup> This paper reviews the arguments from both positions, distinguishing those arguments that work as intended and those that do not. It proposes that a sub-type of sluicing – sprouting, should be carefully examined because it provides clearer evidence against a movement + deletion sluicing and for a base-generation pseudo-sluicing analysis for Chinese. A detailed study of sprouting leads us to more clearly define the identification of the *pro* subject of [*pro* + *be* + *wh*] in various sprouting cases and carefully attend to relevant locality conditions. It also bears on issues regarding null arguments and lexical subcategorization.

The organization of this paper is as follows. Section 2 briefly sets the stage for this study and raises the main issues our study focuses on. This leads to Section 3 on the distinction between sluicing and pseudo-sluicing. We show why the many studies available so far have not provided convincing and decisive evidence for a sole pseudo-sluicing analysis in Chinese, despite claims so made in the literature frequently. The problem and its solution are spelled out in Section 4, which shows how sprouting is the foundation to the claim that only pseudo-sluicing is available

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1 In the subsequent discussions, this paper will use the term "sluicing" to refer to the sluicing construction derived by movement and deletion, and "pseudo-sluicing", a base-generated structure, following Adams (2004), Wei (2004, 2011), Adams and Tomioka (2012), Li and Wei (2014), among others. This contrasts with Merchant's (2001) proposal that pseudo-sluicing in English is also derived by movement and deletion.

in Chinese, and elaborates on the properties of argument spouting and adjunct sprouting in this language. In Section 5, the claim that only a pseudo-sluing analysis is needed in Chinese leads us to capture many interesting constraints on the relevant constructions via the identification of *pro* in the pseudo-sluing [*pro be wh*], as well as the relevance of island conditions in establishing an antecedent to identify the *pro*. Section 6 clarifies remaining issues regarding sprouting and related constructions in Chinese and considers argument sprouting in Chinese from the perspectives of subcategorization and argument ellipsis. Section 7 concludes this paper.

## 2. Setting the stage

As noted, (1a–b) are interpreted as if they contain full-fledged *wh*-questions in the embedded clause. A *wh*-question in English is formed by moving the *wh*-phrase to the left periphery of the clause. Because of the interpretation and important morphological, syntactic properties indicating the presence of a full-fledged structure, the construction has currently been predominantly analyzed as the result of deleting all the elements in the clause except the fronted *wh*-phrase, as represented in (2) below (see, for instance, Merchant 2001). The stranded *wh*-phrase after deletion is generally referred to as the remnant *wh*-phrase.

- (2) a. John saw Mary somewhere, but I don't know [<sub>CP</sub> where [<sub>IP</sub> John saw Mary]].  
 b. Jack resigned, but I don't know [<sub>CP</sub> why [<sub>IP</sub> Jack resigned]].

Such a movement and deletion approach raises the question of whether sluing exists in languages without *wh*-fronting to form *wh*-questions. Would the absence of *wh*-movement in forming *wh*-questions in a language point to the lack of sluing in that language? Chinese is a relevant case. Its *wh*-questions keep *wh*-phrases *in-situ*. Unfortunately, the answer to the question is not straightforward. On the surface, Chinese seems to have the exact counterpart of the English sluing examples in (3a–b) and many others such as in (3c) (Wang 2002; Adams 2004; Wei 2004, etc.).

- (3) a. Zhangsan zai mouge difang kandao Lisi, dan wo bu zhidao shenme difang.  
 Zhangsan at some place see Lisi but I not know what place  
 'Zhangsan saw Lisi at some place, but I don't know where.'  
 b. Zhangsan cizhi le, dan wo bu zhidao weishenme.  
 Zhangsan resign LE but I not know why  
 'Zhangsan resigned, but I don't know why.'  
 c. Zhangsan zou le yi-duan lu, dan wo bu zhidao duoyuan-de lu.  
 Zhangsan walk LE one-CL road but I not know how.far-DE road  
 'Zhangsan walked for a certain distance, but I do not know how far.'

Having acceptable counterparts like those in the sentences above might suggest that Chinese also features sluing derived by movement and deletion. The two languages might just differ in the motivation for the movement of the *wh*-phrase

(see Wang 2002; Wang and Wu 2006). Nonetheless, it has also been noted that the two constructions in the languages are not the same (cf. Adams 2004; Adams and Tomioka 2012; Wei 2004, 2011; Li and Wei 2014, among others). One important difference concerns the occurrence of the morpheme *shi* ‘be’, which is the copular verb in Chinese and is often used to mark the constituent following it as focused. It has been observed that *shi* optionally or even obligatorily occurs with the *wh*-phrase in the relevant construction in Chinese, in contrast to a sole *wh*-phrase in English. That is, *shi* can be added before the *wh*-phrases in (3a–c) above and the meanings do not change. In the following cases, *shi* must appear before the *wh*-phrase (Wang 2002; Adams 2004; Wei 2004, etc.).

- (4) a. Zhangsan renshi mouge ren; dan wo bu zhidao \*(shi) shei.  
 Zhangsan know some person but I not know be who  
 ‘Zhangsan knows someone; but I don’t know who.’  
 b. Zhangsan dadao le dongxi; dan wo bu zhidao \*(shi) shenme.  
 Zhangsan hit LE thing but I not know be what  
 ‘Zhangsan hit something; but I do not know what.’

The similarities and differences have led to debates on how the apparent sluicing cases in Chinese should be analyzed. On the one hand, Wang (2002) and Wang and Wu (2006), extending the movement and deletion approach to Chinese, argue that the *wh*-phrase is a focused constituent, which is raised to the left periphery of the clause (the morpheme ‘at’ may but need not appear in the second part of (5a), after the raising). Then, IP-deletion applies, deriving a counterpart to English sluicing.

- (5) a. Zhangsan zai mouge difang kandao Lisi, dan wo bu  
 Zhangsan at some place saw Lisi but I not  
 zhidao (zai) shenme difang [~~Zhangsan kandao Lisi~~]. (Wang 2002)  
 know at what place Zhangsan saw Lisi  
 ‘Zhangsan saw Lisi at some place; but I don’t know at what place.’  
 b. Zhangsan zou le yi-duan lu, dan wo bu zhidao  
 Zhangsan walk LE one-CL road but I not know  
 duoyuan-de lu [~~Zhangsan zou le~~].  
 how.far-DE road Zhangsan walk LE  
 ‘Zhangsan walked for a certain distance, but I do not know how far.’

A focus movement analysis such as one building on a cleft structure has also been proposed for constructions in other languages that seem to be similar to the Chinese sluicing construction, so that the presence of a copula can be accommodated (see Nishiyama 1995; Nishiyama et al. 1996; Merchant 2001; Fukaya 2003, 2007; Saito 2004 for Japanese; Potsdam 2007 for Malagasy, for instance). According to the cleft structure analysis, the apparent sluicing cases have the form  $[(It) \text{ is } wh_i \text{ [... } x_i \text{ ...}]]$ . The *wh*-phrase is a focused phrase and undergoes raising and the constituent following the *wh*-phrase is deleted. Depending on language-specific properties, the expletive subject might not appear and the copula *be* might also be absent. The result therefore can be a sole *wh*-phrase  $[(It) (be) \text{ wh ...}]$ .

On the other hand, Adams (2004), Wei (2004, 2011), Adams and Tomioka (2012), and Li and Wei (2014), among others, argue that apparent sluicing cases in Chinese are not sluicing and therefore should be analyzed as a base-generated pseudo-sluicing structure. Movement and deletion do not apply. The apparent remnant *wh*-phrase is actually contained in a base-generated clause with a *pro* subject. When the *wh*-phrase is itself a predicate (when it is a complex *wh*-phrase),<sup>2</sup> *shi* optionally occurs as in (6a–b). When the *wh*-phrase itself cannot be a predicate, *shi* must be added to act as a predicate as in (6c). Because the apparent remnant *wh*-phrase in Chinese sluicing must be a predicate in itself, or requires *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. The term “pseudo-sluicing” has been used by these authors and will continue to be so used. The construction has been proposed to be base-generated as it is: [empty subject (+ *shi*) + *wh*-word].

- (6) a. Zhangsan zai mouge difang kandao Lisi, dan wo bu zhidao  
 Zhangsan at some place saw Lisi but I not know  
 pro (shi) zai shenme difang. (Wang 2002; Adams 2004; Wei 2004, etc.)  
 be at what place  
 ‘Zhangsan saw Lisi at some place, but I don’t know at what place that is.’
- b. Zhangsan cizhi le, danshi wo bu zhidao pro (shi) weishenme  
 Zhangsan resign LE but I not know be why  
 ‘Zhangsan resigned, but I don’t know why that is.’
- c. Zhangsan renshi mouge ren, danshi wo bu zhidao pro \*(shi) shei.  
 Zhangsan know some one but I not know be who  
 ‘Zhangsan knows someone, but I don’t know who that is.’

Nonetheless, the arguments advanced for the two opposing positions do not always work the way they are intended for. In Section 3, we re-examine the arguments from both sides and show that most of them cannot be convincingly used to argue against a sluicing analysis, although some of them do indicate the need for a base-generated pseudo-sluicing structure. Section 4 shows that more decisive evidence against the movement + deletion sluicing analysis comes from the lack of argument sprouting in Chinese. The apparent presence of adjunct sprouting follows from the ways by which the subject *pro* of a pseudo-sluice is identified. Section 5 explores further the identification of the subject *pro*, the properties of objects in relation to sprouting, and complications arising from the need to distinguish different cases of empty objects. Then, Section 6 compares English sprouting and its Chinese counterpart. It will be shown that even though English sprouting needs to distinguish different types of verbs in regard to lexical

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2 Wei (2004) argues that there are two types of *wh*-remnants: non-predicative type and predicative type. The former group contains two bare *wh*-words: *shei* ‘who’ and *shenme* ‘what’, and the latter group, all the other *wh*-phrases, which have complex structures and can function as predicates.

subcategorization, Chinese does not. A similar behavior is observed not only in the cases of verbs optionally taking an object such as ‘eat’ but also those that have generally been regarded as typical transitive verbs. Such a lack of distinction between different types of verbs in sprouting possibilities and the related issue of how null objects are interpreted lead us to a more proper characterization of the properties of lexical subcategorization and argument ellipsis in Chinese.

### 3. Sluicing vs. Pseudo-sluicing

Recall that the instances of sluicing in Chinese seemingly corresponding to English sluicing are similar to and yet different from its English counterpart.

For the proponents of a movement + deletion approach (sluicing), such as Wang (2002) and Wang and Wu (2006), similarities between sluicing in English and the relevant construction in Chinese are essential. The occurrence of *shi* ‘be’ preceding the remnant *wh*-phrase in Chinese, in contrast to just a remnant *wh*-phrase in English, is the result of optional PF-insertion of a focus marker before a fronted *wh*-phrase. The obligatory occurrence of *shi* in front of *shei* ‘who’ and *shenme* ‘what’ is due to some prosodic reasons – for instance, the words *shei* and *shenme* are too short to be in the clause-peripheral position.

For the proponents of a base-generated pseudo-sluicing analysis, as briefly noted above, the distribution of *shi* provides the crucial evidence for the requirement of a predicate phrase containing the *wh*-phrase. When the *wh*-phrase itself is a predicate, the copula *shi* can appear optionally; when the *wh*-phrase is not a predicate, the copula *shi* is required.<sup>3</sup> Wei (2004, 2011) argues that *shei* ‘who’ and *shenme* ‘what’ cannot function as predicates, in contrast to other *wh*-phrases, resulting in different requirements on the occurrence of the copula *shi*. The requirement on the occurrence of *shi* in the relevant patterns is determined by the predicate status of the *wh*-phrase.

There are other facts that have been observed and proposed to argue for a pseudo-sluicing and against a sluicing analysis. One involves cases of *wh*-phrases that are not derivable via fronting to the clausal peripheral position. For instance, Wei (2004) notes that the sluicing analysis would not be able to derive certain constructions, such as the ones containing *dao-nali* ‘to where’ in a PP [*cong*...]

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3 Adams (2004) and Wei (2004, 2011) have independently proposed similar analyses, 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 (2004) 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*.

‘from...’ like (7a), or the ones denoting quantity *duoshao-qian* ‘how much’ in (7b), or dates like *xingqi-ji* ‘what day’ in (7c), because such phrases cannot be fronted.

- (7) a. Lisi cong Niuyue chufa (dao mouge difang), dan wo  
 Lisi from N.Y. start to some place but I  
 bu zhidao (shi) dao-nali \*[Lisi cong Niuyue chufa]. (Wei 2004)  
 not know be to-where Lisi from N.Y. start  
 ‘Lisi started out from N.Y., but I don’t know to what place Lisi started out  
 from N.Y.’
- b. Cai yue lai yue gui le, dan wo bu  
 vegetable more come more expensive LE but I not  
 qingchu (shi) duoshao-qian \*[cai yue lai  
 clear be how.much-money vegetable more come  
 yue gui le].  
 more expensive LE  
 ‘Vegetable is getting more and more expensive, but I am not clear by how  
 much vegetable is getting more expensive.’
- c. Biye lüxing kuai dao le, danshi wo bu zhidao (shi) xingqi-ji  
 graduation trip soon arrive LE but I not know be what-day  
 \*[biye lüxing kuai dao le].  
 graduation trip soon arrive LE  
 ‘(Lit.) The graduation trip is almost around the corner, but I don’t know  
 which day of the week.’

In addition, as argued by Wei (2011), the construction in question is more like English pseudo-slucing than sluicing in allowing a strongly non-D-linked *wh*-phrase as in (8–9) and allowing a *wh*-phrase that is related to a noun phrase in a left-branch position as in (10–11).

Strongly non-D-linked *wh*-phrase

- (8) Someone dented my car last night— (Merchant 2001)  
 a. I wish I know who (\*the hell/on earth)!  
 b. I wish I knew who the hell/on earth it was!
- (9) Zhangsan kanjian le mouren, dan wo bu zhidao *daodi*  
 Zhangsan see LE someone but I not know to.bottom  
 shi shei. (Wei 2011)  
 be who  
 ‘Zhangsan saw someone, but I don’t know who on earth it was.’

Left-branch condition violation

- (10) a. \*How big<sub>i</sub> did Andy buy [a t<sub>i</sub> car]? (Wei 2011)  
 b. \*Andy recently bought a car, but I don’t know how big.  
 c. Andy recently bought a car, but I don’t know how big it was.

- (11) a. \*[duo da de]<sub>i</sub> Zhangsan mai le [yi-bu t<sub>i</sub> chezi]? (Wei 2011)  
           how big DE Zhangsan buy LE one-CL car  
       b. Zhangsan mai le yi-bu chezi, dan wo bu zhidao (shi) [duo da (de)].  
           Zhangsan buy LE one-CL car but I not know be how big DE  
           ‘Zhangsan bought a car, but I don’t know how big.’

The fact regarding the (un)acceptability of fronting structures like the ones above has been argued to be evidence against deriving the Chinese sluicing construction via the fronting of the remnant *wh*-phrase for whatever reason, including the movement of the formation of *wh*-phrase in question represented by Merchant (2001), focus movement as in Wang (2002) and Wang and Wu (2006), and the cleft analysis by Merchant (2001), Saito (2004), etc. A base-generation analysis assigning the base-generated form of [*pro* [<sub>predicate</sub> (*be*) *wh*]] in the Chinese construction – referred to as pseudo-sluicing – must be adopted, as proposed by Wei (2004, 2011), Li and Wei (2014), Adams (2004), Adams and Tomioka (2012).

Nonetheless, not all the arguments above argue decisively against the co-existence of a movement + deletion sluicing analysis with a base-generation pseudo-sluicing structure. All the arguments above, except the one related to the use of *shi*, are compatible with a hybrid analysis, which allows both sluicing and pseudo-sluicing in Chinese. The examples that cannot be derived by movement + deletion can be base-generated as pseudo-sluicing structures, and a movement + deletion derivation may still be available to cases like (5), which can be derived by movement + deletion.

The distribution of *shi* potentially is the best candidate to argue against the existence of sluicing. Unfortunately, relevant empirical generalizations are not as clear as one hopes for. According to Wei (2004, 2011), the presence of the copula is dependent upon the predicate status of the *wh*-phrase. If the *wh*-phrase can be a predicate, *shi* ‘be’ is optional; otherwise, *shi* is obligatory. The latter is illustrated by *shei* ‘who’ and *shenme* ‘what’. Such an interpretation faces some challenges. First, when the empty subject is replaced with the demonstrative *na* ‘that’, the copula is obligatory even with predicative *wh*-phrases.

- (12) a. Zhangsan kandao yi-ge ren, danshi wo bu zhidao  
           Zhangsan saw one-CL person but I not know  
           *na* \*(shi) shei/ \*(shi) shenme ren. (Wei 2004; Adams 2004)  
           that be who/ be what person  
           ‘Zhangsan saw someone, but I don’t know who that is.’  
       b. Zhangsan mai-le yixie-dongxi, danshi wo bu zhidao  
           Zhangsan buy-LE some-thing but I not know  
           *na* \*(shi) shenme/ \*(shi) shenme dongxi.  
           that be what/ be what thing  
           ‘Zhangsan bought something, but I don’t know what/what thing that is.’

- c. Zhangsan cizhi-le, danshi wo bu zhidao *na* \*(shi) weishenme.  
 Zhangsan resign-LE but I not know that be why  
 ‘Zhangsan resigned, but I don’t know why that is.’

In addition, when the verb of the second clause *zhidao* ‘know’ is replaced by some other verbs such as *renwei* ‘think’, *caidao* ‘guess (right)’, or *wen* ‘ask’, the copula seems to be required no matter what type of *wh*-remnant follows, even though fronting of a phrase to the peripheral position of the embedded clause of such verbs is otherwise possible.

- (13) a. ta zai jiao yi-ge ren tiaowu; ni renwei \*(shi)  
 he at teach one-CL person dance you think be  
 shei/ shenme ren/ shenme difang.  
 who/ what person/ what place  
 ‘He was teaching a person to dance; who/what/where do you think it was?’  
 cf. a’. ni renwei (shi) shei/shenme ren/ shenme difang ta zui xihuan.  
 you think be who/what person/what place he most like  
 ‘(Lit.) He thinks who/what/where he likes the best?’  
 b. ta zai jiao yi-ge ren tiaowu, wo mei wen \*(shi) shei/shenme  
 he at teach one-CL person dance I not ask be who/what  
 ren/ shenme difang.  
 person/ what place  
 ‘He was teaching a person to dance; I did not ask who/what person/where it was.’  
 cf. b’. wo mei wen (shi) shei/shenme ren/ shenme difang ta zui xihuan.  
 I not ask be who/what person/what place he most like  
 ‘He did not ask who/what/where he liked the best.’

The obligatoriness of the copula *shi* in these contexts raises the question of how reliable it is to account for the distribution of *shi* through the predicative status of *wh*-phrases. On the other hand, it is not clear either that prosody can capture the distribution of *shi*. Recall that the sluicing proponents such as Wang (2002), Wang and Wu (2006) argue that *shei* ‘who’ and *shenme* ‘what’ are too short to occupy the clause-periphery position, which forces the occurrence of a copula in front of such *wh*-phrases. In contrast, the *wh*-phrases, which are longer than the two short ones, can appear by themselves in the clause-periphery position and a sluicing structure is derived. Nonetheless, the fact is that the “short” *wh*-words actually can be fronted to the clause-periphery position, as illustrated in (14b, c). That is, the prosodic length test is not reliable.

- (14) a. ni hui xihuan shei/ shenme ne?  
 you will like who/ what Q  
 ‘Who/what will you like?’  
 b. shei/ shenme ni hui xihuan ne?  
 who/ what you will like Q  
 ‘Who/what will you like?’

- c. ni shei/ shenme hui xihuan ne?  
 you who/ what will like Q  
 ‘Who/what will you like?’

Further complicating the *shi*-test is that judgments are not always clear or universally agreed upon by native speakers. Even for the basic cases that Wei (2004) uses to account for the optional or obligatory occurrence of *shi*, we have not been able to obtain a consistent opinion across speakers. These issues suggest that the distribution of the copula *shi* is more complicated than what has been presented in the literature. There are complicating factors affecting the use of *shi* that have not been sorted out yet. Therefore, it will be more convincing if the question of whether Chinese has sluicing or not can be answered through evidence from other areas, which is what the next section focuses on.

Briefly summarizing, the fact that Chinese seemingly has a close counterpart to the English sluicing construction has generated debates on whether Chinese indeed has sluicing structures. Two logically possible options have been pursued. Various arguments have been proposed to build the case for one or the other option. However, the arguments presented so far do not clearly and decisively argue for or against the existence of movement + deletion sluicing, even though some of them do propose the need of a base-generated pseudo-sluicing analysis. Next, we consider a structure that can provide clearer evidence against the existence of sluicing in Chinese – a sub-type of sluicing, sprouting.

#### 4. Argument sprouting and adjunct sprouting

Clearer evidence against the existence of sluicing in Chinese comes from the so-called sprouting construction, a sub-type of sluicing as discussed in Chung, Ladusaw, and McClosky (1995). Sprouting refers to cases illustrated below:

- (15) I know he ate, but I don't know what<sub>i</sub> (he ate  $x_i$ ).

Chung, Ladusaw, and McClosky discuss two types of verbs in English. One type requires an object overtly and the other can but need not have a co-occurring object.

- (16) a. I know he killed/hit \*(someone).  
 b. I know he ate (something).

Typical transitive verbs in English like *killed/hit* require objects overtly. However, verbs like *ate* do not need to take an overt object structurally. According to Chung, Ladusaw, and McClosky (1995, Section 4), when an overt object is not required, the object licensed by the argument structure of the surrounding material, but not overtly expressed, can be sprouted, illustrated by the *wh*-phrase in cases like (15). This is because an IP from the antecedent clause ('he ate' in [15]) can be "recycled", and an object variable can be added to the structure allowable by the argument structure of the lexical verb at LF – sprouting. Sprouting creates a well-

formed structure with the *wh*-phrase in the peripheral position binding a variable within the IP, just like a sluicing construction illustrated in (1a–b). Sprouting is a subcase of sluicing, both generated by the copying of the antecedent IP. The object variable is either present in the IP in syntactic structures (sluicing) or added at LF as licensed by the argument structure of the verb (sprouting).

In contrast to the possibility of cases like (15) in English, Chinese does not allow sprouting, even when *shi* is present (Wei 2011, Adams and Tomioka 2012):<sup>4</sup>

- (17) a. *wo zhidao ta chi le; \*dan wo bu zhidao*  
 I know he eat LE but I not know  
*shi shenme.* (Wei 2011; Adams and Tomioka 2012)  
 be what  
 ‘I know he ate, but I don’t know what.’
- b. *wo zhidao ta kandao le; \*dan wo bu zhidao shi shenme.*  
 I know he see LE but I not know be what  
 ‘I know he saw, but I don’t know what.’

Such a contrast suggests that the kind of movement that places a *wh*-phrase in the clause-peripheral position and makes sluicing and sprouting possible is not available in Chinese. Therefore, Chinese does not have sluicing. Instead, it has pseudo-sluicing.<sup>5</sup>

It can be further demonstrated that distinctions between possible and impossible adjunct remnant *wh*-phrases support the argument for a base-generated pseudo-sluicing structure and against movement + deletion sluicing in Chinese. First, note that the following sentences involving ‘why’ are acceptable.

- (18) [*Lisi bu xiangxin [Zhangsan xiuxue le]*], *dan wo bu zhidao*  
 Lisi not believe Zhangsan leave-school LE but I not know  
 [*pro (shi) weishenme*]. (Wei 2004)  
 be why  
 ‘Lisi does not believe that Zhangsan has left school, but I don’t know why Zhangsan has left school.’ (Embedded reading)  
 ‘Lisi does not believe that Zhangsan has left school, but I don’t know why Lisi does not believe that Zhangsan has left school.’ (Matrix reading)

In (18), there are two layers of an event structure: one headed by the matrix verb *xiangxin* ‘believe’ and the other headed by the embedded verb *xiuxue* ‘leave school’. Under the pseudo-sluicing analysis, this sentence has the structure [*pro be wh*-remnant], whose subject *pro* needs to be identified.

4 The “sprouting” construction we are concerned with here do not contain rich contextual information establishing a discourse topic to bind an empty object. Section 5 will show that rich contexts allow a construction to be generated with an object variable, bound by a null topic. These are cases involving topic-variable relations, distinct from the sprouting construction in question.

5 Correspondingly, English pseudo-sluicing does not allow sprouting, either (Merchant 2001):  
 (i) He ate; \*but I don’t know what it is.

A *pro* can be identified by a preceding indefinite correlate or a proposition/event (see Wei 2004; Adams and Tomioka 2012). Examples in (4a–b) are instances of *pro*-identification by an indefinite correlate in the preceding clause. In (18) above, the *pro* is identified by the event/proposition expressed by the matrix clause or the embedded clause.

The identification procedure for the cases without an overt indefinite correlate can also be understood as a topic that was established in the preceding discourse to serve as antecedent for some dependent element in the following clause. For instance, in examples like the ones below, the first sentence or the clause embedded under the matrix verb can become the topic identifying the subject *pro* in the second sentence – the entire first sentence serves as a topic or the embedded clause undergoing a topicalization process to become a topic.

- (19) a. [ta zhong-le da jiang le]<sub>i</sub>, pro<sub>i</sub> zhen shi bukesiyi.  
 he win-LE big prize LE really be unbelievable  
 ‘[He won a big prize.] (It) is really unbelievable.’  
 b. wo zhidao [ta zhong-le da jiang le]<sub>i</sub>, pro<sub>i</sub> zhen shi bukesiyi.  
 I know he win-LE big prize LE really be unbelievable  
 ‘I know [he won a big prize]. (It) is really unbelievable.’

However, what can become a topic for the following discourse is restricted by the locality conditions governing topicalization, as illustrated by the unacceptability of the following example:

- (20) ta [yinwei Lisi zhong-le da jiang]<sub>i</sub> hen gaoping. \*pro<sub>i</sub> zhen shi  
 he because Lisi win-LE big prize very happy really be  
 bukesiyi.  
 unbelievable  
 ‘He is happy because Lisi won a big prize. (It) is really unbelievable.’

The subject *pro* is interpreted as ‘he is happy because Lisi won a big prize’, not just the adjunct clause ‘Lisi won a big prize’. Similarly, island conditions are active in interpreting sprouting *wh*-adjuncts as illustrated below.

- (21) ta [yinwei bu yuanyi lai] bei henduo ren piping,  
 he because not willing come by many people criticize  
 dan wo bu zhidao [pro (shi) weishenme].  
 but I not know be why  
 a. ‘Because he is not willing to come, he is criticized by many people, but I don’t know why he is criticized by many people because he is not willing to come.’  
 b. \*‘Because he is not willing to come, he is criticized by many people, but I don’t know why he is not willing to come.’

An adjunct *why* is grammatical in (21a) when the *wh*-phrase ascertains the reason for the event expressed by the entire preceding sentence ‘he is criticized by many

people because he is not willing to come.’ However, it cannot be about the reason of the event expressed by the clause in an adjunct island ‘he is not willing to come,’ as in (21b). That is, the identification of the subject *pro* in the clause containing the *wh*-phrase displays island effects, which topicalization is sensitive to.

In brief, in the cases without an overt indefinite correlate, the restriction on how the subject *pro* is identified can be understood in terms of the (im)possibility of establishing a discourse topic for the following comment via a topicalization process in the preceding sentence. We have shown that the matrix clause or the clause embedded under the matrix verb can become a discourse topic, but not a clause within an island.

Further note that the acceptability of adjuncts in sprouting constructions should not be taken as evidence supporting a movement + deletion approach. Were the option of moving a phrase to the beginning of a clause followed by IP-deletion available, it is not clear why sprouting of arguments is not possible, as in (17a–b). That is, between the two options of deriving sluicing and sprouting constructions, the base-generation approach is favored over the movement + deletion approach.

However, considering the contrast between adjunct sprouting and argument sprouting, there is a third option to derive adjunct sprouting, logically speaking, especially given the fact in Chinese that subjects can generally be left empty. This third option is deletion without involving a movement. That is, the remnant adjunct *wh*-phrase is base-generated in its place and all the other constituents in the clause are deleted or do not appear overtly such as using a null subject. Take the adjunct ‘why’ or ‘at what place/time’ for instance. Potentially, it is possible to base-generate these adjunct *wh*-phrases peripheral to an IP or a VP. The remaining IP constituent following the *wh*-phrase is deleted, or VP-deletion applies with the subject taking the null form. To illustrate, sentences like (18a–b) may have the following structure – a *wh*-adjunct base-generated in its position and IP or VP deletion applies:

(22) (empty subject) *wh* [(subject) predicate]

Such an approach can avoid the problems of the movement + deletion approach regarding movement impossibilities as reviewed in Section 3, because no movement is involved in the derivation. Nonetheless, an immediate challenge against such an option is the issue of whether it is possible at all to delete the IP or VP following an adjunct. For instance, were it possible for a VP following an adjunct to be deleted, it is not clear why the following parallel structure, most facilitating for deletion, is not acceptable:

(23) a. wo   zhidao ta cong Meiguo yinhang jie-le       henduo qian,  
 I   know he from America bank borrow-LE much money  
 \*dan bu zhidao (ta) ye (shi) cong Zhongguo yinhang  
 but not know he also be from Chinese bank  
 [jie-le — henduo qian].  
 borrow-LE much money  
 ‘I know he borrowed lots of money from Bank of America, but do not know that (he) also (borrowed a lot of money) from Bank of China.’

- b. wo zhidao ta zai zhuo-shang xie zi,  
 I know he at table-top write word  
 \*dan bu zhidao (ta) ye (shi) zai yizi-shang [~~xie—zi~~].  
 but not know he also be at chair-top write word  
 ‘I know he wrote on the table but do not know he also (wrote) on the chair.’

IP deletion after an adjunct is not possible, either:

- (24) wo zhidao qunian ta qu nar, \*dan bu zhidao jinnian [ta—qu—nar].  
 I know last.year he go where but not know this.year he go where  
 ‘I know where he went last year, but do not know (where he went) this year.’

There are other problems challenging such a base-generation + deletion approach. One comes from the comparison of the two ‘why’ expressions – *weishenme* and *zenme*. These two expressions share the property of being able to appear before the IP they modify:

- (25) weishenme/zenme ta bu lai le?  
 why he not come LE  
 ‘Why isn’t he coming?’

However, they differ in the acceptability of appearing in sluicing/sprouting constructions: *weishenme* is fine, not *zenme*. In (18a–b), we saw examples of *weishenme* ‘why’ in sluicing/sprouting constructions. However, replacing *weishenme* with *zenme* is not possible.

- (26) a. ta bu yuanyi lai, \*dan wo bu zhidao (shi) zenme.  
 he not willing come but I not know be why  
 ‘He is not willing to come, but I don’t know why.’  
 b. wo zhidao [ta bu yuanyi lai], \*dan wo bu zhidao (shi) zenme].  
 I know he not willing come but I not know be why  
 ‘I know that he is not willing to come, but I don’t know why he is not willing to come.’

The contrast between the acceptability of (18a–b) with *weishenme* ‘why’ and the unacceptability of (26a–b) with *zenme* ‘why’ is unexpected if we derive (18a–b) via deletion of the IP following the *wh*-phrase (cf. [25]). On the other hand, such a contrast is expected under a base-generation approach to pseudo-sluicing [*pro* (*be*) *wh*] as described above, i.e., if these sentences are base-generated as they are and no deletion is applied. This is because the two ‘why’ expressions differ in their possibility to appear in a predicate position: *weishenme* but not *zenme* can do so with or without *shi*:

- (27) [ta bu lai] (shi) weishenme/\*zenme?  
 he not come be why  
 ‘Why is it that he is not coming?’

Another problem with the base-generation + deletion approach in question concerns the elements that need to be deleted – those that must undergo deletion do not form constituents. Consider the following example:

- (28) wo zhidao tamen dagai cong qi-dian nianshu,  
 I know they probably from 7-o'clock study  
 keshi wo bu zhidao shi dao ji-dian.  
 but I not know be to what-hour  
 'I know they probably studied from 7 o'clock, but I do not know to what hour.'

For the said base-generation with deletion approach to derive the above sentence, the parts that do not form a constituent should be deleted from the source structure. The two PPs in (29) below, the 'from'-phrase and the 'to'-phrase, form a constituent (cf. Paul 2015, Ch. 4). Deletion has to apply to part of the double PP phrase and the rest of the clause.

- (29) keshi wo bu zhidao ~~tamen dagai~~ shi  
 but I not know they probably be  
 [~~cong qi-dian~~ ~~dao ji-dian~~] nianshu.  
 from 7-o'clock to what-hour study

Under the base-generation approach advocated in this paper, (29) simply involves the structure [*pro* *be* PP]. Deletion is irrelevant. Another similar case is shown below:

- (30) a. wo zhidao ta tongchang zai wanshang da dianhua, keshi wo bu  
 I know he usually at evening hit phone but I not  
 zhidao shi ji-dian.  
 know be what-hour  
 'I know he usually makes phone calls in evenings, but I do not know what hour.'
- b. keshi wo bu zhidao ta ~~tongchang~~ shi [~~zai wanshang~~ ji-dian]  
 but I not know he usually be at evening what-hour  
~~da dianhua~~.  
 hit phone  
 'but I don't know at what hour.'

In (30b), 'what hour' is part of the time phrase 'at what hour in the evening'. Again, were this derived from a deletion operation, non-constituents would have to be illegally deleted. In contrast, according to a pseudo-slucing analysis, as long as the empty subject *pro* is properly identified, the structure can be interpreted and is grammatical. As mentioned, the subject *pro* can be identified by a preceding indefinite correlate or proposition/event. The absence of an indefinite correlate in sprouting cases indicates that the *pro* should be identified by a preceding proposition or event. In (29), the event is their studying ('the event of their studying will be till what hour?'; and in (30), their making phone calls ('the event of their making phone calls will be at what hour?').

Briefly summarizing, we have argued that Chinese only allows a base-generated pseudo-sluicing (including sprouting) construction [*pro be wh*]. Neither the deletion + movement approach nor an alternative of base-generation + deletion analysis could accommodate the relevant facts. As only a base-generated pseudo-sluicing is possible in Chinese, taking the form [*pro (be) wh*], it is expected that the acceptability of the construction, including the sub-type sprouting construction, is restricted by how the *pro* subject is properly identified. In the argument case, the *pro* subject needs to be identified by an argument antecedent. Without an indefinite correlate or a topic established in the preceding discourse, the *pro* fails to be identified. In the adjunct case, the *pro* subject can be identified by the event/proposition in the preceding discourse. Island conditions are relevant.

Before turning to the next section, we briefly discuss why Chinese does not have the English-type sluicing or sprouting constructions. Recall that Chinese does not move its *wh*-phrases to form *wh*-questions. However, movement of a *wh*-phrase to the periphery position of a clause is fundamental to deriving sluicing/sprouting constructions under either an LF-copying approach such as Chung, Ladusaw, and McClosky (1995), or a PF-deletion approach such as Merchant (2001). Recall that in order to motivate the movement of a *wh*-phrase to the clause-periphery position in Chinese, a *wh-in-situ* language, Wang (2002) and Wang and Wu (2006) argue that a *wh*-phrase is a phrase of focus and focus movement applies to front it to the periphery position. Similarly, focus movement of a *wh*-phrase can be applied to derive a cleft construction, allowing a *wh*-phrase to occur in the clause-peripheral position. A cleft-structure analysis has been proposed for the counterpart of English sluicing in some other languages, such as in Japanese (see Saito 2004, among others). However, the challenge facing a focus-movement approach is to prove that such a focus movement to the clause-peripheral position indeed exists in Chinese. Fronting of a phrase might indeed be available in Chinese for the purpose of focusing the phrase. A contrastive interpretation must be present when the movement is clause-bound, and a long-distance moved phrase is generally interpreted as a topic (Shyu 1995; Ernst and Wang 1995, among others; also see Paul 2015, Ch. 6 for the distinction between topic and focus). For instance, fronting of a phrase as shown below is not possible unless a contrastive clause follows.

- (31) Zhangsan, Li xiaojie<sub>i</sub> yiqian jiu renshi le e<sub>i</sub>, \*(Wang xiaojie<sub>j</sub> xianzai  
 Zhangsan, Li Miss before then know LE Wang Miss now  
 cai renshi e<sub>j</sub>).  
 only know  
 ‘Zhangsan knew Miss Li before, but only knew Miss Wang now.’

The following examples illustrate the fact that a phrase like *xiao gou* ‘small dogs’ in (32) fronted across clauses (long-distance movement) must end in the topic

position and interpreted as topic.<sup>6</sup>

- (32) a. \*ta, xiao gou zhidao wo bu xihuan.  
 he small dog know I not like  
 ‘He knows I don’t like small dogs.’  
 b. xiao gou ta zhidao wo bu xihuan  
 small dog he know I not like  
 ‘Small dogs, he knows I don’t like.’

On the other hand, a focus without a contrastive interpretation generally does not involve movement in Chinese.<sup>7</sup> For instance, the constituent in answer to the *wh*-phrase in a *wh*-question is the information focus of a sentence.<sup>8</sup> Importantly, an answer to a *wh*-phrase is not fronted.

- (33) Q: ni chi shenme?  
 you eat what  
 ‘What did you eat?’  
 A: a. wo chi sanmingzhi.  
 I eat sandwich  
 ‘I ate sandwich’  
 b. \*sanmingzhi, wo chi.  
 sandwich I eat  
 ‘(Lit.) Sandwich, I ate.’

This contrasts with a *yes–no* question–answer pair, whose answer can topicalize a constituent in the statement underlying the question, such as the object in the following example.

6 The examples in (32) are important because an inanimate phrase can be more easily fronted to the focus or topic position following a subject within a clause. Cross-clausally, no noun phrases can be moved to the post-subject position. However, cross-clausal relations are always possible in sluicing/sprouting cases.

7 A reviewer pointed out that the *lian...dou* ‘even...all’ construction could move a focused phrase to the clause-peripheral position: *lian xiaohai ta dou bu xihuan* ‘even children, he all does not like [he does not even like children]’. However, *dou* ‘all’ is required in this case (or other similar markers such as *ye* ‘also’). Without *dou* or other similar markers, a preposed phrase is generally contrastive or a topic.

8 A *wh*-phrase in a *wh*-question and the answer to the *wh*-phrase are the foci of the relevant sentences, which accounts for why another focus in the sentence is not possible (see Yang 2012; Li 2011; Li and Cheung 2015, among others):

- (i) Q: shei (\*shi) zuotian likai le?  
 who be yesterday leave LE  
 ‘Who \*YESTERDAY/yesterday left?’ [YESTERDAY focused, in addition to *who*]  
 A: Zhangsan (\*shi) zuotian likai le.  
 Zhangsan be yesterday leave LE  
 ‘Zhangsan \*YESTERDAY/yesterday left?’ [YESTERDAY focused, in addition to the answer *Zhangsan*]

- (34) Q: ni chi sanmingzhi ma?  
 you eat sandwich Q  
 ‘Do you eat sandwich?’  
 A: sanmingzhi, wo chi.  
 Sandwich, I eat  
 ‘(Lit.) Sandwich, I eat.’

The generalization is this: what appears at the beginning of a sentence in Chinese is generally a topic, not a focus. A focus structure in this language is typically expressed through the use of *shi* in front of the focused constituent like *zuotian* ‘yesterday’ in (35), without changing word order. Such reliance on *shi* to mark focus without changing word order is also reflected in the fact that a cleft construction in English corresponds to the *shi* focus structure (with or without *de*, see Paris 1979; Paul 2002, 2005; Paul and Whitman 2008; Shi 1994; Cheng 2008, among many others, for *shi* and *shi... de* constructions):

- (35) a. It was yesterday that he went to a movie.  
 b. ta shi zuotian qu kan dianying (de).  
 he be yesterday go see movie DE  
 ‘It was yesterday that he went to see a movie.’

If ‘yesterday’ is preposed, the interpretation is that ‘yesterday’ is a topic (see, for instance, Paul 2015, Ch. 6):

- (36) zuotian, ta qu kan le dianying.  
 yesterday he go see LE movie  
 ‘Yesterday, he went to see a movie.’

A pseudo-cleft structure might be relevant for focus. A pseudo-cleft in Chinese is a headless relative clause, which is generally only possible with argument relativization, not adjunct relativization (Aoun and Li 2003, for instance). Adjuncts can be relativized in headed relativization constructions. Importantly, what is moved in a case illustrated in (37a) below, which contains a relativized temporal adverbial, is not the remnant *wh*-phrase, which occurs on the other side of the copula, as in (37b) below:

- (37) a. [[ta lai de] \*(shijian)] shi zuotian.  
 he come DE time be yesterday  
 ‘The time when he came was yesterday.’  
 b. [[ta lai de] \*(shijian)] shi shenme shihou?  
 he come DE time be what time  
 ‘When was the time when he came?’

The lack of focus movement to derive sluicing/sprouting also captures the fact that sentences like the following are not acceptable:

- (38) a. Zhangsan zhidao LISI yiding hui lai, \*ye zhidao (shi) WANGWU.  
 Zhangsan know Lisi certainly will come also know be WANGWU  
 ‘Zhangsan knows that LISI certainly will come, (he) also knows WANGWU  
 (certainly will come).’
- b. Zhangsan zhidao wo xihuan LISI, \*dan bu zhidao (shi) WANGWU.  
 Zhangsan know I like Lisi but not know be WANGWU  
 ‘Zhangsan knows that I like LISI but does not know (I like) WANGWU.’
- c. Zhangsan zhidao wo ZAI XUEXIAO nianshu, \*dan bu zhidao (shi)  
 Zhangsan know I at school study but not know be  
 ZAI JIALI.  
 at home  
 ‘Zhangsan knows I study AT SCHOOL but does not know (I study) AT  
 HOME.’

In these sentences, the noun phrases in capitals are contrasted and focused. Were it possible to move a focused phrase followed by deletion of the non-focused part, one should be able to move WANGWU in (38a–b) and ZAI JIALI in (38c) to an IP-peripheral position. Then, the IP following the focused phrase is deleted. It is not expected that these sentences are not acceptable. On the other hand, the *pro* analysis straightforwardly rules them out via the identification of *pro*, the subject of the clause embedded under the matrix verb ‘know’ in the second part of these sentences. For instance, in (38a–b), the focus information in the antecedent sentence would make *pro* identified with the focused phrase LISI. Then, *Lisi* would be predicated of by (be) WANGWU, resulting in the ill-formed structure [LISI (shi) WAGNWU].

In short, the absence of sprouting in Chinese casts doubt on the existence of the English type of sluicing in Chinese (movement of a *wh*-phrase and deletion of IP), as shown in (17). The rationale for moving a *wh*-phrase based on the notion of focus to derive a sluicing structure in Chinese as in (2) is also questionable. Before further discussing the ungrammaticality of (17), we will turn to some apparent sprouting cases, which should be analyzed as object variables bound by null topics established from the context.

## 5. Identification and locality conditions

What was described in the previous section about the lack of argument sprouting can be complicated by other options for an object, mainly because in Chinese objects can be left empty for various reasons. For instance, a sentence like the following can be acceptable in rich contexts, such as the situation described below.

- (39) [He was to take several medications each day. He asked for a glass of water because it was time for him to take one of his medications. I gave him a glass of water. The glass of water is now empty; accordingly, I know that he has taken his medication, just not knowing which kind this time.]

wo zhidao ta yijing chi-le\_\_\_, zhishi bu zhidao shi  
 I know he already eat-LE just not know be  
 na yi zhong yao.  
 which one kind medicine  
 'I know he already ate, but I just do not know which kind of medicine.'

Why does a case like this, which does not seem to have an object in the first clause, seemingly allow object sprouting in the second clause, in contrast to those in (17)? We can find an answer by carefully examining the context in which such sentences are acceptable. As described, (39) is acceptable in the following context:

He was to take several medications each day. He asked for a glass of water because it was time for him to take one of his medications. I gave him a glass of water. The glass of water is now empty; accordingly, I know that he has taken his medication, just not knowing which kind this time.

In this case, an object is actually there and the object is related to a topic in the discourse. That is, the object is a variable. Its reference can be recovered from the context, via an empty discourse topic (cf. the notion of empty topic as in Huang 1982). In other words, cases like the first part of (39) simply contain an object variable bound by an empty topic. It is not a sprouting structure. In the second part of (39), a *pro* subject before the copular verb 'be' is identified by an empty topic established from the previous discourse. That is, the structure is just like what has been proposed for the pseudo-sluicing construction, as discussed so far, and, as expected, the object in the antecedent clause can be overt like (40):

(40) wo zhidao ta yijing chi-le yao, zhishi bu zhidao  
 I know he already eat-LE medication just not know  
 [pro shi nayizhong yao].  
 be which.kind medication  
 'I know he has already taken medications, but I just do not know which kind of medication.'

We also predict that the construction illustrated in (39) is acceptable only when a discourse topic can be established to bind a following empty argument. Such a correlation indeed exists. In Li (1985, 1990), it is shown that subjects and objects in Chinese can be topicalized, but not an indirect object (cf. Keenan and Comrie 1977 on noun phrase accessibility). Therefore, our prediction is that a subject and an object in the antecedent clause, but not an indirect object, can be topicalized and the topicalized phrase can bind an argument variable in the following clause. This prediction is borne out. The following examples show that a subject and a direct object can lead to the establishment of a topic, via topicalization of the subject or object in the antecedent clause, binding an empty argument in the following clause, but an indirect object cannot as in (41).

- (41) a. Zhangsan song le Lisi naben shu, \_\_ juede hen gaoxing.  
 Zhangsan give LE Lisi that book feel very happy  
 ‘Zhangsan<sub>i</sub> gave Lisi<sub>j</sub> that book, (he<sub>i/\*j</sub>) felt happy.’  
 b. Zhangsan song le Lisi naben shu, \_\_ bu pianyi.  
 Zhangsan give LE Lisi that book not cheap  
 ‘Zhangsan gave Lisi that book<sub>i</sub>, (it=that book<sub>i</sub>) is not cheap.’

The empty subject of the second clause in these sentences can be coindexed with the subject in the preceding clause in (41a) or the direct object in (41b), but not the indirect object in either one.<sup>9</sup>

Correspondingly, when the context is clear and a null topic is available to bind a variable in the subject or object position in the antecedent clause, the topic can bind an argument in the following clause, creating a seemingly sprouting construction. For instance, the sentence in (42a) below is possible under a context clear to the speaker and hearer that a teacher gave Lisi that book. The sentence in (42b) is acceptable when it is known to the speaker and hearer that Zhangsan gave Lisi a book.

- (42) a. \_\_ song le Lisi naben shu le, keshi wo bu zhidao \_\_ (shi)  
 give LE Lisi that book LE but I not know be  
 na yige laoshi.  
 which one teacher  
 ‘[A teacher] gave Lisi a book, but I don’t know which teacher that is.’  
 b. Zhangsan song le Lisi \_\_ le, keshi wo bu zhidao \_\_ (shi)  
 Zhangsan give LE Lisi LE but I not know be  
 na yiben shu.  
 which one book  
 ‘Zhangsan gave Lisi [a book], but I don’t know which book that is.’

As expected, an empty indirect object does not make possible such a construction, as illustrated by the following example.

- (43) Zhangsan song le naben shu le, \*keshi wo bu zhidao \_\_ (shi)  
 Zhangsan give LE that book LE but I not know be  
 na yige laoshi.  
 which one teacher  
 ‘Zhangsan gave a book, but I don’t know which teacher that is.’

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9 If the empty subject in the second clause is replaced by an overt pronoun, coindexation with an indirect object is possible. This further supports the need to distinguish interpretive possibilities and identification requirements for overt and null pronouns, as mentioned in Adams and Tomioka (2012).

It is also expected that the object of a preposition should not establish a discourse topic, either, because topicalization of an oblique object is not possible in Chinese.<sup>10</sup> This is true: the empty subject in the case below cannot be coindexed with *Lisi*, the object of *gei* ‘to’.<sup>11</sup>

- (44) Zhangsan gei Lisi da le dianhua, \_\_\_ feichang gaoxing.  
 Zhangsan to Lisi hit LE phone very happy  
 ‘Zhangsan<sub>i</sub> made a call to Lisi<sub>j</sub>, (he<sub>i/\*j</sub> was) very happy.’

A “sprouting” PP structure (more accurately, a base-generated pseudo-slucing structure) is possible in (45), but the empty subject in the second clause is related to the object in the preceding clause – the call that Zhangsan made, or the event of Zhangsan’s making a call. For the latter, the entire sluice clause expresses *Zhangsan da dianhua shi gei shei* ‘Zhangsan’s making a call was to whom’.

- (45) Zhangsan da le dianhua, keshi wo bu zhidao \_\_\_ (shi)  
 Zhangsan hit LE phone but I not know be  
 gei shei. (Wei 2004; Adams 2004)  
 to whom  
 ‘Zhangsan made a call, but I don’t know to whom (the call) was.’

In addition, as topicalization in Chinese obeys island conditions (see, among others, Huang 1982; Li 1985, Li 1990), a null argument within an island cannot be topicalized and function as a null topic to identify an empty pronoun in the subject position of a following clause. For instance, the following sentences involving an adjunct island and a complex NP island are not possible.

- (46) a. Lisi [yinwei wo mei mai\_\_\_] hen shengqi,  
 Lisi because I not buy very angry  
 \*keshi wo bu zhidao \_\_\_ shi shenme/ nayiben shu  
 but I not know be what/ which book  
 ‘(Lit.) Lisi was angry because I did not buy (something/some book), but I don’t know what/which book.’  
 b. [Zhangsan du le \_\_\_ yihou] tebie gaoxing,  
 Zhangsan read LE after especially happy  
 \*keshi wo bu zhidao \_\_\_ shi shenme/ nayiben shu.  
 but I not know be what/ which book  
 ‘(Lit.) After Zhangsan read (something), he was especially happy, but I don’t know what/which book.’

10 This can follow from Keenan and Comrie’s (1977) noun phrase accessibility – subject > direct object > indirect object > oblique object. As an indirect object cannot be topicalized, an oblique object lower than an indirect object in the accessibility hierarchy fails to be topicalized as well. Structurally, it is possible to say that the impossibility of topicalizing an oblique object is due to the prohibition against preposition stranding in Chinese.

11 The prohibition against preposition stranding also prevents us from creating an example with a null prepositional object for an apparent sprouting structure.

- c. \*[[ta tiao \_\_ de] fangfa] hen hao, dan wo bu zhidao \_\_ shi  
 he pick DE way very good but I not know be  
 shenme/ nayijian.  
 what/ which  
 ‘(Lit.) The ways that he chose (something) were good, but I don’t know  
 what/which one.’

In sum, the *pro* subject of a pseudo-slucose (including the sprouting subcase) [*pro be wh*] can be identified by a discourse topic established through topicalization of the subject or the direct object of the antecedent clause. The establishment of a discourse topic and therefore the interpretation of the subject *pro* are sensitive to locality conditions.

## 6. Subcategorization and argument ellipsis

We should point out that what has been discussed so far applies not only to verbs like ‘eat’, the type of verbs in English that optionally takes an object, serving as the core data for establishing sprouting structures in Chung, Ladusaw, and McClosky (1995), but also to typical transitive verbs like *da* ‘hit’.<sup>12</sup>

- (47) Zhangsan mei chi shenme (dongxi), Lisi chi-le; \*dan ta bu  
 Zhangsan has.not eat some thing Lisi eat-LE but he not  
 zhidao shi shenme (dongxi).  
 know be what thing  
 ‘Zhangsan has not eaten anything; Lisi ate (something), but he didn’t know  
 what.’
- (48) Zhangsan mei da shenme (dongxi), Lisi da-le; \*dan ta bu  
 Zhangsan has.not hit some thing Lisi hit-LE but he not  
 zhidao shi shenme (dongxi).  
 know be what thing  
 ‘Zhangsan has not hit anything; Lisi hit (something), but he didn’t know  
 what.’

The second clause of these sentences ‘Lisi ate/hit’ seems to have the interpretation of ‘eat’ and ‘hit’ verbs having an indefinite object ‘something’, even though, no object overtly appears (argument ellipsis). However, such a missing object does not license argument sprouting.

Recall that discussions on English sprouting constructions have focused on ‘eat’-type verbs, because they can but need not take an object syntactically. The optionality of an object for such verbs in English makes sprouting possible,

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<sup>12</sup> Importantly, these examples use indefinite expressions, to separate them from those with a variable in the object position, bound by a topic, which cannot be indefinite.

according to Chung, Ladusaw, and McClosky (1995). When an object is absent syntactically, the possibility of an object based on the argument structure of a verb can be “sprouted” at LF in the form of a variable so that a *wh*-phrase at the clause-periphery position can bind it. In contrast, for an obligatorily transitive verb, English requires its object to appear overtly; therefore, the case is not relevant to sprouting constructions. In contrast, Chinese does not allow argument sprouting, because a *wh*-phrase is not raised to the clause-periphery position. However, Chinese allows its arguments to be empty (argument drop or argument ellipsis, see Huang 1982, 1984, 1987, 1989, among others). The unacceptability of sentences like (47–48) raises the following question: if a verb is transitive, it takes an object. Can’t the object of a transitive verb be “deleted”? Then, wouldn’t it be reasonable to expect that (47–48) could be like the following sentences with overt objects, via recovery or reconstruction of a deleted object?

- (49) Zhangsan mei chi shenme (dongxi), Lisi chi-le shenme (dongxi);  
 Zhangsan has.not eat what thing Lisi eat-LE what thing  
 dan ta bu zhidao shi shenme (dongxi).  
 but he not know be what thing  
 ‘Zhangsan has not eaten anything, Lisi has eaten something, but I don’t know what (thing).’
- (50) Zhangsan mei da shenme (dongxi), Lisi da-le shenme (dongxi),  
 Zhangsan has.not hit what thing Lisi hit-LE what thing  
 dan ta bu zhidao shi shenme (dongxi).  
 but he not know be what thing  
 ‘Zhangsan has not hit anything, Lisi has hit something, but I don’t know what.’

The two sets of sentences do differ in acceptability, as noted. When the object is empty in (47–48), the subsequent [*pro be wh*] is not acceptable. Why is it so? A related question is whether Chinese distinguishes verb types at all in terms of their subcategorization properties, like English *eat*, optionally taking an object, vs. obligatorily transitive verbs like English *hit* or *kill* (\**He hit/killed someone* in that house). Below, we briefly show why, regardless of whether Chinese distinguishes verb types, the unacceptability of [*pro be wh*] following an empty object as in (47–48) is not expected unless we recognize the existence of a true empty category (TEC) as in the proposal in Li (2005, 2014a) and Aoun and Li (2008).

According to Lin (2001), Chinese verbs differ from English ones regarding their subcategorization properties. English lexically specifies when an object is required by a verb – a transitive verb requires an object and an intransitive does not. In contrast, Chinese does not have such lexical specifications. That is, Chinese verbs are not lexically specified for thematic roles to assign to arguments. Arguments are licensed by light verbs projected in the syntactic structure such as DO, OCCUR, AT, USE, HAPPEN, etc. In other words, lexical items in Chinese are not specified for their subcategorization properties, according to Lin. It is light verbs that license

or assign thematic roles to the arguments in their Specifier positions. Because lexical items are not specified for their subcategorization properties, arguments are generally non-selected, in contrast to those in English, which are selected. This captures the fact that Chinese allows various types of non-canonical arguments in subject and object positions, such as ‘he cut [with] a big knife’, ‘they like to run [in] the park’, ‘Mornings sell peanuts’, etc. (see Li 2014b; Barrie and Li 2015 for constraints). If indeed, arguments are only licensed by light verbs, one might claim that Chinese verbs indeed are not distinguished into different types lexically and that a clause [*pro be wh*] (Chinese type sprouting) following a clause with an apparent transitive verb is not possible simply because Chinese verbs do not specify their argument structures lexically. The interpretation of having a seemingly missing indefinite object in (47–48) is just a vague interpretation obtainable from the discourse context. The context allows an interpretation not derivable by syntactic structures.

However, it is not clear that arguments are only licensed by light verbs in the approach as in Lin (2001), and that, even if they are, a clause [*pro be wh*] (Chinese type sprouting) is expected to be possible or impossible when following a clause with an apparent transitive verb. In Lin (2001), a theme object actually is merged with a V directly, not a light verb. When a V can license an argument directly, a V has a thematic role to assign, at least in the cases where a theme is present. No light verbs are involved. That is, even under Lin’s proposal, a verb can still be subcategorized for a theme object and have a thematic role to assign. Moreover, the surface form of a verb does not tell us if a verb is simply a root V combined with zero or 1 or 2 light verbs and what those light verbs are. That is, we cannot tell what is in the numeration such that every item, including all possible light verbs, has been projected in a certain tree structure. Coupled with the possibility of argument drop in Chinese, it is not clear that, if an object is not present overtly, it is not projected syntactically. Therefore, it remains a mystery that the absence of an overt object fails to license the *pro* of the following clause [*pro be wh*] and to make the Chinese type sprouting possible.

On the other hand, Li (2005, 2014a) argues that the empty category as a result of apparent argument drop is not due to deletion. Rather than derived via deletion, the object position in (47–48) and (17) is base-generated empty. This empty object cannot be a PRO or *pro* due to the conflict between the identification requirement on PRO/*pro* (the first c-commanding antecedent as in Huang 1982) and the disjointness requirement on pronouns (free from subject). Nor is it an NP trace. In the case of (47–48), it is not a variable, either, because there is no topic to bind the empty object. Since none of the recognized empty categories are available, Li proposes that the base-generated empty object is a true empty category (TEC). A TEC only has a Case feature, which captures the distribution of TEC, as discussed in Li (2014a). It has no referential index nor phi features. Therefore, it cannot serve

as antecedent for the subject *pro* in following clause.<sup>13</sup> The subsequent [*pro be wh*] therefore is not possible, as shown in (47–48).

## 7. Conclusion

Sluicing has been an important construction to show that what is not seen or heard can still be syntactically active, as evident in Merchant (2001) and many others. Such behavior is nicely captured by a movement + deletion approach. However, the proposed analysis is tied to the movement of a *wh*-phrase to the clause-peripheral position in the formation of *wh*-questions. The question that naturally follows is what happens in *wh-in-situ* languages, such as Chinese. Arguments for the two logical possibilities have been advanced. One is to claim that sluicing also exists in Chinese and similar movement + deletion operations are at work. The modification needed is that movement applies to a focused phrase, instead of a *wh*-phrase as in the way *wh*-questions are formed. The other is to deny that Chinese has a true counterpart of the English sluicing. Instead, it has a base-generated pseudo-sluicing structure containing a *pro* subject: [*pro + be + wh*]. This paper reviewed the arguments from both sides and concluded that most of the arguments only argued for the need of a base-generated structure and did not argue against the existence of a true sluicing structure in Chinese. The argument based on the occurrence of the copular verb *shi* is difficult to assess, because of the uncertainty of data and some still-to-be-determined factors. All in all, the clear empirical support against a movement + deletion sluicing and for a base-generation pseudo-sluicing analysis for Chinese is the lack of argument sprouting. We also showed that in general Chinese does not have the type of focus movement + deletion operation needed to derive a focus-driven sluicing/sprouting structure.

In addition, we clarified complications regarding apparent argument sprouting cases and the acceptability of adjunct sprouting. The former is due to the availability of an empty topic binding a variable in an object position in the antecedent clause, enabling the subject *pro* of the pseudo-sluice [*pro + be + wh*] to be identified. The latter follows from the fact that the subject *pro* of [*pro + be + wh*] can be identified by a proposition/event in the preceding discourse. The identification of *pro* in apparent argument sprouting and adjunct sprouting cases is united under the notion of topic – a subject or a direct object or a proposition/event in the antecedent clause can be established as a topic. The topic identifies the subject *pro* within [*pro + be + wh*]. Because topicalization is sensitive to locality conditions, the identification of *pro* demonstrates relevant locality effects.

We further compared the types of verbs relevant to the English sprouting construction and the Chinese cases, because they bear on issues related to lexical subcategorization, argument selection, and argument ellipsis. English requires its

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13 However, after LF copying, a TEC can obtain a referential index and phi features from its antecedent. That is, a TEC can be a dependent but not an antecedent.

subcategorized object to be present overtly; therefore, sprouting is only possible in the type of verbs like *eat*, which is optionally subcategorized for an object. Because Chinese does not distinguish verbs optionally or obligatorily subcategorized for an object in regard to sprouting possibilities, the question was raised as to what an empty object was in the construction whose object argument was missing due to argument drop/argument ellipsis. An example was a parallel structure with the object of the first clause being an indefinite expression and the second clause not having an overt object. Although the presence of an indefinite object seemed to be included in the interpretation, sprouting is not licensed. We argued that an analysis such as Lin's (2001) licensing arguments via light verbs was not sufficient, because a theme object was still licensed by a verb in such an analysis. It was proposed that we could still allow a null object to be present in null argument cases, except that the null object does not have features to serve as antecedent to identify the following *pro* – the notion of true empty category as in Aoun and Li (2008), Li (2007, 2014a).

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## 漢語的切割、芽生結構和消失賓語

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### 提要

本文檢視支持與反對漢語有典型切割結構的兩種論證，我們發現由基底衍生分析（Wei 2004, Adams 2004 等）所提反對漢語擁有典型移位刪除切割結構（Merchant 2001）的證據不夠充分，因為連繫詞“是”的出現仍無法完全排除移位刪除分析之可能性。我們主張漢語“切割結構”不允許賓語位置芽生結構的語言事實，才是證明基底衍生準切割句存在的可信證據。此分析亦對空論元、主題及變項關係、孤島效應以及動詞的次類劃分等議題，有相當啓示作用。

### 關鍵詞

芽生，切割結構，準切割句，主題，變項