

Remarks on the Particle *Suo* in Mandarin Relatives**T.-H. Jonah Lin**

Abstract. This work examines the particle *suo* in Mandarin relative clauses. It is argued that *suo* is not an object clitic as some previous proposals claim it to be. This paper presents new observations and argues that *suo* is a relational focus operator. Syntactically, it is adjoined to AspP in overt syntax but moves to TP in LF binding an argumental variable. Semantically, *suo* focalizes the involvement of the relative head in the event that the relative clause denotes, in reference to the argumental variable that it binds.

1. Introduction

The particle *suo* in Mandarin, whose original meaning is ‘place’ or ‘location’, occurs in two contexts: in relative clauses and in passives. In both contexts *suo* is optional. See the following examples.¹

- (1) a. [Zhangsan mai *e*] de shu
 Zhangsan buy MOD book
 ‘The book that Zhangsan bought’
- b. [Zhangsan suo mai *e*] de shu
 Zhangsan SUO buy MOD book
 ‘The book that Zhangsan bought’
- (2) a. Zhangsan bei Lisi qipian.
 Zhangsan PASS Lisi deceive
 ‘Zhangsan was deceived by Lisi.’

¹ For convenience, *suo* is simply glossed as its capital form, SUO. Other abbreviations used in this paper are: CL = classifier; MOD = modification marker; PASS = passive marker; PERF = perfective marker.

The grammatical judgments reported in this paper are from the author, a native speaker of Taiwanese Mandarin.

- b. Zhangsan bei Lisi suo qipian.
 Zhangsan PASS Lisi SUO deceive
 ‘Zhangsan was deceived by Lisi.’

Traditionally, *suo* is considered a nominalization marker; when it is attached to a verb, it turns the verb into a nominal (see Yap and Wang 2011 for an overview). However, some syntacticians look at *suo* with theoretical interests, because it seems to be directly associated with object movement. Various analyses have been suggested. Chiu (1995) proposes that *suo* heads a projection and behaves like AgrO in the early minimalist theory; An and Kuo (2007) propose that *suo* is an object clitic that moves through the Spec of AgrOP; Ou (2007) considers *suo* an object relative pronoun. The theory of Ting (2003) (also see Ting 2005, 2008, 2009, and 2010) is particularly influential. According to Ting’s theory, *suo* is a clitic attached to I^0 or some neighboring functional category. Ting also argues that the behavior of *suo* is governed by general grammatical principles such as the ECP.

This paper argues for a different theory. It shows that a close examination of the properties of *suo* indicates that *suo* cannot be an object clitic. Instead, this paper proposes that *suo* is a *relational focus operator*. Syntactically, it is base-generated as an adjunct to AspP and moves to TP at LF, binding an argumental variable in the clause; semantically, it focalizes the involvement of the relative head in the event denoted by the relative clause, in reference to the argumental variable that *suo* binds.

This paper is organized as follows. In section 2, we briefly go through the properties of *suo* and Ting’s proposal. In section 3, Ting’s analysis is re-examined, and the grammatical properties of *suo* are reconsidered. In section 4, we present the proposed theory, and discuss the syntax and semantics of *suo*. In section 5, we discuss questions on subject relativization and *suo*. Section 6 is the conclusion.

2. Properties of *suo*

To start with, we look at some important properties of *suo* in Ting’s discussion (also see Chiu 1995).

First, *suo* can only occur in relative clauses and passives; it cannot occur in ordinary sentences. The sentences in (1) and (2) above are examples of *suo* in a relative clause and in a passive. The examples in (3) demonstrate that *suo* is unacceptable in an active sentence (see Ting 2003: 122).

- (3) a. Zhangsan zebei-le Lisi.
 Zhangsan blame-PERF Lisi
 ‘Zhangsan blamed Lisi.’

- b. *Zhangsan suo zebei-le Lisi.
Zhangsan SUO blame-PERF Lisi

Second, when *suo* occurs in a relative clause, the object must undergo relativization. *Suo* is incompatible with subject relativization (Ting 2003: 123).

- (4) a. [Zhangsan mai e] de naxie shu
Zhangsan buy MOD those book
'The books that Zhangsan bought'
- b. [Zhangsan suo mai e] de naxie shu
Zhangsan SUO buy MOD those book
'The books that Zhangsan bought'
- (5) a. [e mai naxie shu] de ren
buy those book MOD people
'People who bought those books'
- b. *[e suo mai naxie shu] de ren
SUO buy those book MOD people
Intended: 'People who bought those books'

Third, *suo* is incompatible with relativization of adverbials, such as time, manner, reason, and so on. See the examples in (6). But *suo* is compatible with relativization of location, as in (7). ((6a-c) are from Ting 2003: 126, and (7a-b) are from Ting 2003: 125; grammatical judgments are Ting's.)

- (6) a. ??Lisi suo gongzuo de shijian
Lisi SUO work MOD time
Intended: 'The time at which Lisi works'
- b. *Lisi suo gongzuo de fangfa
Lisi SUO work MOD method
Intended: 'The method in which Lisi works'
- c. *Lisi suo gongzuo de yuanyin
Lisi SUO work MOD reason
Intended: 'The reason for which Lisi works'
- (7) a. Lisi suo fuwu / gongzuo de jigou / difang
Lisi SUO serve work MOD institution place
'The institution / place where Lisi serves / works'

- b. Women suo shengcun de shehui
 we SUO live MOD society
 ‘The society in which we live’

Ting (2003) argues against Chiu’s (1995) proposal that *suo* heads a projection that marks the accusative Case (one piece of evidence being the fact that *suo* is compatible with the relativization of location, which clearly doesn’t need Case). Instead, Ting (2003) proposes that *suo* is an object clitic adjoined to I^0 . According to this theory, *suo* is base-generated in the object position and moves to I^0 . An empty operator OP is also generated in Spec of CP of the relative clause, which is co-indexed with *suo* and binds it. Ting argues that *suo* is adjoined to I^0 because, according to Ting’s analysis, *suo* is lower than the sentential adverbs and the subject-oriented adverbs, but higher than the negation, manner adverbs, and the main verb of the clause (see Ting 2003: 123).

In Ting 2010, the analysis of *suo* is slightly modified. In the new analysis, *suo* is assumed to be the head of a DP, a D element, which takes an NP complement. When this DP undergoes relativization, the NP complement moves to CP, and *suo* moves to a position that is slightly lower than TP, which Ting (2010) calls FP. However, in this modified analysis, the essentials of the theory remain unchanged: *suo* is an object clitic, and it moves to T^0 or a functional category in the neighborhood of T^0 .

Ting proposes that the above analysis accounts for the syntactic properties of *suo*. *Suo* is compatible with object relativization but not subject relativization because of the Empty Category Principle (ECP). Suppose that *suo* is base-generated in an argument position and moves to I^0 . Under the government theory of the GB framework (Chomsky 1981), the object position is a properly governed position, yet the subject position is not. As a result, when *suo* is base-generated in the object position, the trace it leaves is properly head-governed. But when it is base-generated in the subject position, its trace cannot be properly governed, either by a head or by an antecedent, because the movement to I^0 would amount to a lowering operation. So, in Ting’s theory, the subject-object asymmetry of *suo* can be accounted for by the ECP.

A similar account is suggested for the incompatibility of *suo* with relativization of adverbials; namely, the trace left by the movement of the adverbial would fail to be properly governed. The relativization of location phrases is compatible with *suo* because, according to Ting (2003), location phrases could be selected elements. Other adverbials are incompatible with *suo* because they are not selected elements (Ting 2003: 132-133).

3. Reconsidering the properties of *suo*

In this section, we take a closer look at the behavior of *suo* and show that Ting’s proposal suffers a number of problems. These problems indicate that *suo* cannot be an

object clitic. A new theory is needed.

3.1 Conceptual problems of the clitic analysis

There are at least two conceptual problems with Ting's analysis. The first problem is about the proper government of the subject trace. According to Ting's analysis, *suo* cannot be base-generated in the subject position because the resulting trace would not be properly governed. But this is problematic. The subject position of English sentences is indeed not properly governed. However, Huang (1982) shows that the subject of Mandarin sentences patterns with the object rather than with adjuncts in terms of proper government. For example, the sentence (8a) has the reading shown by the LF representation (8b), such that the embedded *wh*-subject takes the wide scope and the embedded *wh*-adverb takes the narrow scope.² This indicates that the embedded subject trace is properly head-governed (in Huang's (1982) theory, by a lexical INFL), because in LF the embedded *wh*-subject moves out of a *wh*-island without causing ungrammaticality.

- (8) a. Zhangsan gaosu Lisi [shei zenmeyang xiu che]?
 Zhangsan tell Lisi who how repair car
 ‘Who is the person *x* such that Zhangsan told Lisi how *x* repaired the car?’
 b. [CP shei₁ [TP Zhangsan gaosu Lisi [CP zenmeyang₂ [TP *t*₁ xiu
 who Zhangsan tell Lisi how repair
 che *t*₂]]]]
 car

So, if subject traces in Mandarin pattern with object traces with respect to proper government, then the ECP account of the incompatibility of *suo* with subject relativization loses grounds.³

The second conceptual problem is the compatibility of *suo* with relativization of the location phrase, and the incompatibility of *suo* with relativization of other adverbials. According to Ting (2003), the location phrases are selected elements, so, when the clitic *suo* represents a location phrase, and when it moves, the resulting trace can be properly governed. Other adverbials are not selected elements, so, in Ting's (2003) words, this would “introduce barriers for the trace of an extracted *suo* so that raising of *suo* to *I*⁰ in such cases will be ill-formed” (Ting 2003: 134). But Ting's discussion of the “barriers” and their effects in relation to the ECP is quite obscure; as a result, it is not clear what is meant by Ting with the term “barriers” and how the notion is technically implemented. An even more important question is, why are location phrases selected elements? If *suo* may freely occur with

² (8a) has another reading according to which both *wh*-phrases take the narrow scope. That reading does not concern us here.

³ We are not committed to any specific theory on the licensing of subject movement. In particular, if we assume the minimalist theory (Chomsky 1995 and subsequent work), the licensing of subject movement cannot be stated in terms of the ECP any more.

relativization of location phrases, then one has to conclude that location phrases are universally selected. This is a strong claim that needs to be argued for. Without substantial evidence, the ECP account for the compatibility of *suo* with relativization of location phrases, and the incompatibility of *suo* with other adverbials, remain dubious.

3.2 The structural position of *suo*

Ting (2003, 2010) proposes that *suo* is adjoined to T^0 or a functional category in the neighborhood of T^0 (in Ting's words, "in a split-INFL domain;" Ting 2010: 463). However, we find that the structural position of *suo* is in fact lower.

We assume that in Mandarin sentences, TP takes AspP as complement, and AspP takes *v*P as complement (see Cheng 1991 and Shen 2004 for the category AspP). We propose that *suo* is an adverbial element at AspP. The reason is as follows.

First, *suo* must follow the time adverbs. See (9a-c).

- (9) a. Zhangsan zuotian mai de shu
 Zhangsan yesterday buy MOD book
 'The book that Zhangsan bought yesterday'
- b. Zhangsan zuotian **suo** mai de shu
 Zhangsan yesterday SUO buy MOD book
 'The book that Zhangsan bought yesterday'
- c. *Zhangsan **suo** zuotian mai de shu
 Zhangsan SUO yesterday buy MOD book
 Intended: 'The book that Zhangsan bought yesterday'

Suppose that time adverbs are licensed by TP. The examples (9a-c) indicate that *suo* must be lower than TP.

Second, *suo* must follow the location adverbials, too. See (10a-c). Furthermore, we find that location adverbials must follow time adverbs. See (11a-b). This means that location adverbials are licensed by a functional projection lower than TP in structure. We assume it is AspP.⁴ Thus, *suo* cannot be higher than AspP.

⁴ AspP appears to be a plausible host for the location adverbials for the following reasons. An important fact about location adverbials is that they are directly associated with the aspectual properties of predicates. Maienborn (2001, 2005, 2008) argues that locative modifiers come in three types: frame-setting modifiers, external modifiers, and internal modifiers. The location adverbials in (10)-(11) are external locative modifiers, which denote locations where events culminate or hold true. Maienborn argues that the external locative modifiers are base-generated at the periphery of the predicate of the sentence (in Maienborn's (2001) framework, VP). Furthermore, they only occur with non-state predicates -- state predicates cannot take external locative modifiers. This supports the proposed association of the location adverbials with AspP, which, we assume, is the outermost functional category of the predicate of the sentence. At AspP, location adverbials are semantically licensed by the aspect of the predicate, specifically by the non-state (or dynamic) value in Asp⁰ (see Shen 2004), on the assumption that the aspectual property of a Mandarin predicate is primarily (but not exclusively) determined by the aspectual information superimposed upon the verbal phrase (Smith 1994).

- (10) a. Zhangsan zai Taipei mai de shu
 Zhangsan at Taipei buy MOD book
 ‘The book that Zhangsan bought in Taipei’
- b. Zhangsan zai Taipei **suo** mai de shu
 Zhangsan at Taipei SUO buy MOD book
 ‘The book that Zhangsan bought in Taipei’
- c. *Zhangsan **suo** zai Taipei mai de shu
 Zhangsan SUO at Taipei buy MOD book
 ‘The book that Zhangsan bought in Taipei’
- (11) a. Zhangsan zuotian zai Taipei mai-le yiben shu.
 Zhangsan yesterday at Taipei buy-PERF one.CL book
 ‘Zhangsan bought a book in Taipei yesterday.’
- b. *Zhangsan zai Taipei zuotian mai-le yiben shu.
 Zhangsan at Taipei yesterday buy-PERF one.CL book
 Intended: ‘Zhangsan bought a book yesterday in Taipei.’

Third, *suo* must precede aspectual adverbs. Consider the following examples:

- (12) a. Zhangsan yizhi guanzhu de wenti.
 Zhangsan continually concentrate MOD problem
 ‘The problem that Zhangsan concentrates on continually’
- b. Zhangsan **suo** yizhi guanzhu de wenti.
 Zhangsan SUO continually concentrate MOD problem
 ‘The problem that Zhangsan concentrates on continually’
- c. ??Zhangsan yizhi **suo** guanzhu de wenti.
 Zhangsan continually SUO concentrate MOD problem
 Intended: ‘The problem that Zhangsan concentrates on continually’
- (13) a. Zhangsan jingchang guanggu de jiudian.
 Zhangsan often visit MOD pub
 ‘The pub that Zhangsan often visits’
- b. Zhangsan **suo** jingchang guanggu de jiudian.
 Zhangsan SUO often visit MOD pub
 ‘The pub that Zhangsan often visits’

These considerations justify the association of location adverbials with AspP in Mandarin sentences.

- c. ??Zhangsan jingchang suo guanggu de jiudian.
 Zhangsan often SUO visit MOD pub
 ‘The pub that Zhangsan often visits’

(12)-(13) show that *suo* must precede the continuative adverb *yizhi* ‘continually’ and the frequency adverb *jingchang* ‘often’, both of which are presumably licensed by AspP. This fact, in conjunction with the fact shown in (10)-(11), indicates that *suo* is an adverbial element licensed by Asp⁰. *Suo* must be lower than the location adverbials, but it has to be higher than the aspectual adverbs; if these two types of adverbials are adjoined to AspP, then *suo* must be, too, since it is -- so to speak -- “sandwiched” between the two different types of AspP-adverbials.⁵

The above discussion, therefore, indicates that *suo* is an adverbial element at AspP. It is not on T⁰ or some unidentified functional category in the neighborhood of T⁰.⁶

3.3 Relativization of non-object

Ting (2003) claims that *suo* is only compatible with relativization of object and location;

⁵ One can indeed come up with examples in which *suo* occurs with both types of adverbial, such as (i). Notice that the word order is as expected, namely location - *suo* - aspectual. Other word orders give rise to ungrammaticality.

- (i) Zhangsan zai Taipei suo yizhi guanggu de jiudian.
 Zhangsan at Taipei SUO continually visit MOD pub
 ‘The pub that Zhangsan keeps visiting in Taipei.’

Intriguingly, however, if *suo* does not occur, the ordering between the location adverbial and the aspectual adverb can be free. The following two examples are both grammatical.

- (ii) a. Zhangsan zai Taipei jingchang mai de dongxi.
 Zhangsan at Taipei often buy MOD thing
 ‘The thing that Zhangsan often buys in Taipei’
 b. Zhangsan jingchang zai Taipei mai de dongxi.
 Zhangsan often at Taipei buy MOD thing
 ‘The thing that Zhangsan often buys in Taipei’

It is not clear why the presence of *suo* causes a fixed order of the location adverbial and the aspectual adverb, but the fact that it occurs between the two suffices to show that *suo* is generated at AspP. We will thus assume that the location adverbials, aspectual adverbs, and *suo* are all adjoined to AspP, and their relative ordering is determined by semantic factors that are still not clear at this stage. Note incidentally that if *suo* is adjoined to AspP, then it is not an X⁰. We will leave aside questions on the categorial identity of *suo* and whether it shows X⁰ or XP properties.

⁶ *Suo* may precede modals, which some have assumed to be INFL elements, e.g. *yinggai* ‘should’ in the following examples.

- (i) a. [Ta suo yinggai huida] de wenti
 he SUO should answer MOD question
 ‘Questions that he should answer’
 b. *[Ta yinggai suo huida] de wenti
 he should SUO answer MOD question

But Lin and Tang (1995) and Lin (2012) have shown that Mandarin modals are verbs, not INFL elements; so they are low in structure.

it is incompatible with relativization of other adverbials. This is empirically incorrect. A search of examples of *suo* on the internet gives us a great number of examples where *suo* occurs with relativization of various sorts of adverbials. Below are some examples.

- (14) a. Wo **suo** cunzai de **liyou**⁷
 I SUO exist MOD reason
 ‘The reason for which I exist’ (Reason)
- b. Jianchaguan **suo** sheli de **mudi**⁸
 prosecutor SUO establish MOD purpose
 ‘The purpose for which court prosecutors are set up’ (Purpose)
- c. Nin **suo** caozuo de **fangshi**⁹
 you SUO operate MOD manner
 ‘The way in which you operate [the system]’ (Manner)
- d. Chenghao butong, ta **suo** huode de **tujing**
 title different it SUO acquire MOD pathway
 ye butong.¹⁰
 too different
 ‘For different titles, the pathways through which he acquires [them] are also different.’ (Means)
- e. Zhexie gu-wenwu **suo** qude de **laiyuan** yu **helixing**.¹¹
 these antique SUO obtain MOD source and validity
 ‘The source from which and the validity in which these antiques were obtained.’ (Source and manner)

In these real-world examples, *suo* occurs with relativization of reason, means, manner, purpose, and other adverbials. Thus, the claim that *suo* is only compatible with relativization of object and location is not true.

An even more interesting phenomenon is the following. It is known that Mandarin has a special kind of “gapless relatives” whose head does not correspond to any argument or adverbial in the clause (see Tang 1979 and Zhang 2008, among others). See the following examples for demonstration.

- (15) a. [Zhangsan tan gangqin] de shengyin
 Zhangsan play piano MOD sound
 ‘The sound of Zhangsan playing the piano’

⁷ <http://mypaper.pchome.com.tw/option0442/post/1271648829>.

⁸ <http://zh.wikipedia.org/wiki/%E6%AA%A2%E5%AF%9F%E5%AE%98>.

⁹ http://qa.xuite.net/faq_answer.php?fid=41.

¹⁰ <http://xq.funimax.com/article/1416>.

¹¹ <http://blog.yam.com/bonnie080/article/33649373>.

- b. [Xuesheng kangyi zhengfu] de houguo
 student protest government MOD consequence
 ‘The consequence of the students protesting against the government’

If we insert *suo* into these gapless relative clauses, we obtain ungrammatical results:

- (16) a. *[Zhangsan **suo** tan gangqin] de shengyin
 Zhangsan SUO play piano MOD sound
 b. *[Xuesheng **suo** kangyi zhengfu] de dongzuo
 student SUO protest government MOD action

However, if we move away the object of these gapless relative clauses and replace it with an empty category, then, surprisingly, the examples become grammatical:

- (17) a. [Ta **suo** tan e] de shengyin hen hao-ting.
 he SUO play MOD sound very good-hear
 ‘The sound of him playing [the piano] is pleasant to hear.’
 b. [Tamen **suo** kangyi e] de houguo shi
 they SUO protest MOD consequence be
 zhengfu geng yanli de daya.
 government more severe MOD suppression
 ‘The consequence of them protesting against [the government] was stronger suppression by government.’

This phenomenon reveals two things. First, in the examples (17a-b), neither an argument (subject or object) nor an adverbial is relativized, yet *suo* still may occur. Second, many examples that are bad with *suo* may become significantly improved if the object of the clause is dislocated (i.e. replaced by an empty category). The examples (16)-(17) provide a good illustration. This appears true with the examples (14b-e), too, where the verb of the relative clause is transitive yet the object argument is dislocated.¹²

4. *Suo* as a relational focus operator

Two generalizations can be obtained from the discussion above.

(A) *Suo* is compatible with relativization of object as well as adverbials. (On the question of subject relativization, see section 4.3.)

(B) It seems that object dislocation is a requirement for the appearance of *suo*. The

¹² In (14a), the main verb of the relative clause *cunzai* ‘exist’ is an unaccusative verb, whose surface subject is in fact an underlying object. So (14a) also involves an object empty category, consistent with the generalization here.

examples in (14) and (16)-(17) show that object dislocation makes the appearance of *suo* grammatical.¹³

In this section, we present our theory of *suo* and account for these properties.

4.1 The syntax

We propose that *suo* is a *relational focus operator*. Syntactically, it is base-generated as an adjunct to AspP; and in LF, it moves and adjoins to the TP of the relative clause, from which position it binds an argumental variable.¹⁴ Semantically, it focalizes the involvement of the relative head in the event that the relative clause denotes, in reference to the argumental variable it binds.

To start with, we adopt the “Kaynean” approach to Mandarin relative clauses argued for

¹³ An anonymous reviewer of an earlier draft of this paper provided the following sentences trying to show that object dislocation is not necessary for *suo*:

- (i) a. Zhe jiu shi wo suo baofu ta de fangshi.
 this exactly is I SUO revenge him MOD manner
 ‘This is exactly the way in which I revenge him.’
 b. Zhe jiu shi wo suo paoqi ta de yuanyin
 this exactly is I SUO abandon him MOD reason
 ‘This is exactly the reason that I abandoned him.’

These sentences indeed sound relatively good. However, if the pronominal object *ta* in these sentences is replaced by a common noun or a proper name, the sentences become much worse:

- (ii) a. ??Zhe jiu shi wo suo baofu **Zhangsan** de fangshi.
 this exactly is I SUO revenge Zhangsan MOD manner
 Intended: ‘This is exactly the way in which I revenge him.’
 b. ??Zhe jiu shi wo suo paoqi **Zhangsan** de yuanyin
 this exactly is I SUO abandon Zhangsan MOD reason
 Intended: ‘This is exactly the reason that I abandoned him.’

(iiia-iiib) also show the same contrast:

- (iii) a. Nali jiu shi wo suo kanjian **ta** de difang.
 there exactly is I SUO see him MOD place
 ‘That is exactly the place where I saw him.’
 b. ??Nali jiu shi wo suo kanjian **Zhangsan** de difang.
 there exactly is I SUO see Zhangsan MOD place
 Intended: ‘That is exactly the place where I saw Zhangsan.’

Thus it is really not the case that *suo* can freely occur with an overt object in the relative clause. We tentatively suggest the following account for the acceptability of sentences like (ia-b) and (iiia). Suppose that the object pronoun *ta* in these sentences, being grammatically and prosodically weak, is cliticized to the verb forming a complex lexical verb; thus, for instance, the VP in (ia) would be as follows:

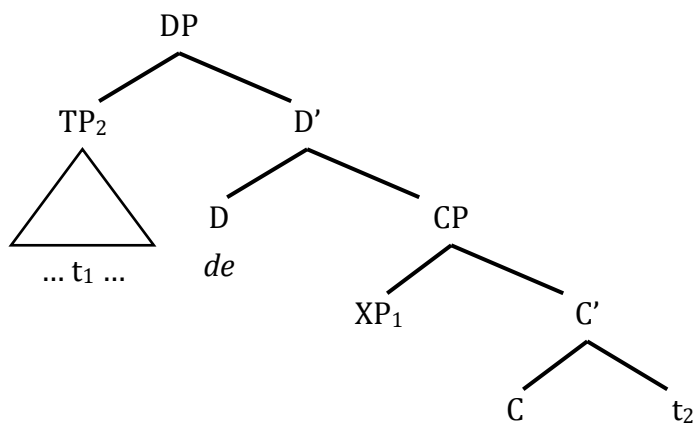
- (iv) ... [_{VP} [_V *baofu-ta*₁] t₁]

So, there is in fact object dislocation, consistent with the generalization (B) in the text. A common noun or proper name is grammatically and prosodically heavy, so it cannot be cliticized to the verb. This is why the sentences (iia-b) and (iiib) are unacceptable.

¹⁴ Partee (1995: 546) proposes that focus constructions in natural languages yield a tripartite structure in the semantic representation, on a par with other quantificational constructions. This provides a motivation for assuming LF movement of *suo*.

in Simpson 2003 and Saito et al. 2008. Look at the diagram (18) for illustration. XP is the relative head, which moves from within TP to Spec of CP. Then TP undergoes remnant movement to Spec of DP, leaving the relative head XP behind. The modification marker *de* is a D element.

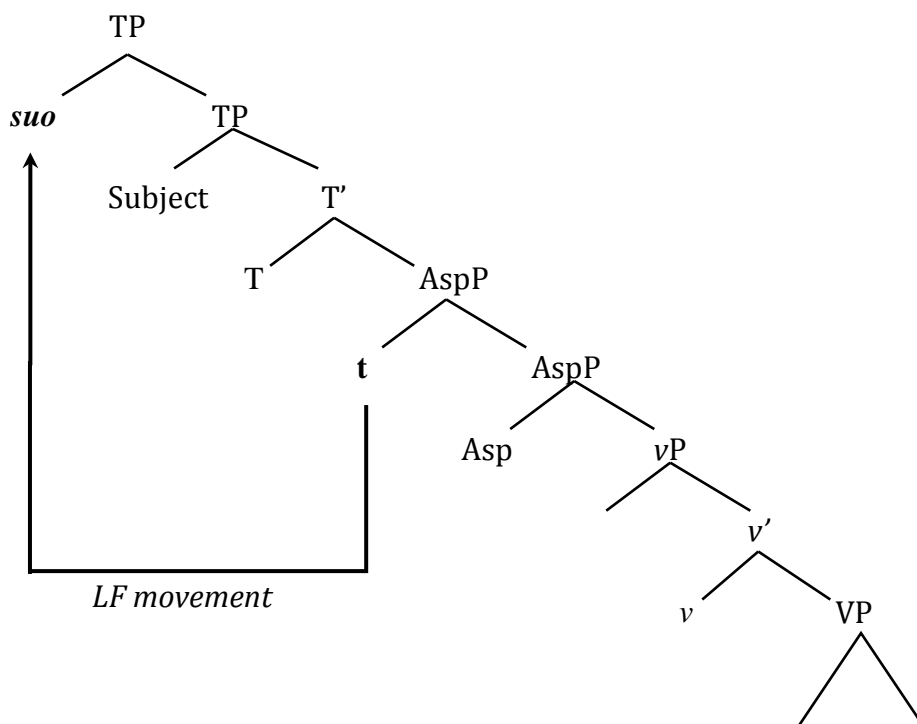
(18)



(As for gapless relatives such as (17a-b), we assume with Zhang (2008) that they do not involve movement, but are licensed by a special predication relation between the head and the clause. Recast in the approach assumed here, this would mean that XP is base-generated in Spec of CP rather than moving from within TP.)

We propose the following structure for the relative clause (= TP in (18)) that contains *suo* (the movement of the subject to Spec of TP from Spec of *v*P is omitted).

(19)



In overt syntax, *suo* is base-generated as an adjunct to AspP. In LF, it adjoins to TP in a way similar to Quantifier Raising (QR). At the TP-adjunction position, *suo* binds its own trace; however, in addition, it also binds an *argumental variable*, which provides a reference against which the focalization function is applied (more on this in the next subsection). In typical situations, the argumental variable is the empty category left by the object that undergoes relativization, as in (20a). But in the case where *suo* occurs in a relative clause with relativization of an adverbial (and also in the case of gapless relatives), the argumental variable is still the empty category of the object, which is created by object topicalization or dropping of the object (e.g. represented by an empty resumptive pronoun), as in (20b).

- (20) a. $[_{TP} \text{ suo}_1 [_{TP} \dots e_1]]$ *de* XP_1
 b. $(YP_1) \dots [_{TP} \text{ suo}_1 [_{TP} \dots (e_2) \dots e_1]]$ *de* XP_2

There is evidence for the movement of *suo* in LF. If *suo* is a focus operator, then its LF movement would be blocked by other focus elements in the same clause, due to violation of the refined version of relativized minimality proposed by Rizzi (2004). This appears to be true. Consider the examples in (21a-c). (21a) shows that the focus modifier *zhìyou* ‘only’ may occur in a relative clause modifying the subject. (21b) shows that *suo* may occur in the same relative clause if *zhìyou* ‘only’ does not occur. (21c) shows that if *zhìyou* ‘only’ and *suo* co-occur in the same relative clause, ungrammaticality results. If *suo* is a focus operator that undergoes LF movement, then the ungrammaticality of (21c) receives a natural explanation: the movement of *suo* violates relativized minimality, as the presence of another focus element blocks the movement.

- (21) a. [Zhìyou Zhangsan mai e] de shu
 only Zhangsan buy MOD book
 ‘Books that only Zhangsan bought’
 b. [Zhangsan suo mai e] de shu
 Zhangsan SUO buy MOD book
 ‘Books that Zhangsan bought’
 c. *[Zhìyou Zhangsan suo mai e] de shu
 only Zhangsan SUO buy MOD book
 Intended: ‘Books that only Zhangsan bought’

Another piece of evidence is that *suo* is incompatible with the *lián...dōu* focus construction:

- (22) a. [Lian Zhangsan dou mai *e*] de shu
 even Zhangsan all buy MOD book
 ‘Books that even Zhangsan [would] buy’
- b. *[Lian Zhangsan dou suo mai *e*] de shu
 even Zhangsan all SUO buy MOD book
- c. *[Lian Zhangsan suo dou mai *e*] de shu
 even Zhangsan SUO all buy MOD book

Again, if we assume that *suo* undergoes LF movement, then the ungrammaticality of (22b-c) can be readily attributed to the violation of the refined relativized minimality, as another focus element, i.e. the *lian...dou* focus expression, intervenes and blocks the movement of *suo*.

4.2 The semantics

Next we look at the semantic function of *suo*. As a relational focus operator, it focalizes the involvement of the relative head in the event that the relative clause denotes. We assume that the focus function that *suo* introduces is presentational focus, not contrastive focus (see É Kiss 1998), because it does not seem to trigger contrast of possible alternatives. Furthermore, the focus function of *suo* is relational, in the sense that it applies in reference to the argumental variable that *suo* binds, on the presupposition that the relative head is closely related to the entity that the argumental variable represents. We assume that the function of the argumental variable is to serve as a “checking reference” that evaluates the degree of involvement of the relative head in the event. We illustrate the semantic function of *suo* by the following examples.

- (23) a. [Zhangsan suo xihuan *e*] de ren
 Zhangsan SUO like MOD person
 ‘The person that Zhangsan likes’
- b. [Nin **suo** caozuo *e*] de fangshi (= (14c))
 you SUO operate MOD manner
 ‘The way in which you operate [the system]’
- c. [Ta **suo** tan *e*] de shengyin (= (17a))
 he SUO play MOD sound
 ‘The sound of him playing [the piano]’

In (23a), *suo* focalizes the involvement of the relative head *ren* ‘person’ in the event of *xihuan* ‘like’. In this example, object dislocation comes as a direct consequence of the relativization of the object, so *suo* binds the empty category *e* left by the relativization of the object. The semantic function of *suo* applies as follow: *suo* focalizes the involvement of the

relative head *ren* ‘person’ in the event of *xihuan* ‘like’ in reference to the argumental variable *ren* ‘person’. Since the relative head *ren* ‘person’ and the argumental variable *ren* ‘person’ are closely related -- in fact, they are the same element and therefore are identical -- the involvement of *ren* ‘person’ in the event of *xihuan* ‘like’ is validated. The focalization function of *suo* applies felicitously, because the presupposition on the close relationship between the relative head and the argumental variable is respected.

In (23b), *suo* focalizes the involvement of the relative head *fangshi* ‘manner’ in the event of *caozuo* ‘operate’ in reference to the argumental variable *e* left by the dislocated object ‘system’. Because a manner, according to the Davidsonian event semantics, is a predicate of the event argument (Parsons 1990), and because the object is also a predicate of the event argument, they are co-predicates of the same event argument and hence are closely related. Thus, the involvement of the relative head *fangshi* ‘manner’ is validated, and the focalization function of *suo* applies felicitously.

In (23c), *suo* focalizes the involvement of the relative head *shengyin* ‘sound’ in the event of *tan* ‘play [a piano]’ in reference to the argumental variable *e* left by the dislocated object ‘piano’. Since the relative head *shengyin* ‘sound’ does not correspond to any argumental or adverbial role in the relative clause, it is not a co-predicate of the object argument (i.e. the empty category *e*). However, in this particular case, the relative head *shengyin* ‘sound’ comes to existence as a direct consequence of the action of piano-playing; in this sense it could be viewed as some sort of “extended object” of the predicate of the relative clause.¹⁵ Thus we could still take it to be closely related to the object argument of the event -- in fact, the sound is a direct product of the object argument, the piano. So the focalization function of *suo* applies felicitously.

We need to say something about the argumental variable that *suo* binds. As pointed out above, we assume that the function of the argumental variable provides a reference against which the involvement of the relative head is evaluated. Why must it be argumental? And why is it the object argument? The rationale is as follows. Suppose we want to measure the involvement of an element X in an event. We can do it by choosing a core element Y of the event and see how close X is to Y. Since Y is a core element of the event, the closer X is to Y, the more substantial X is involved in the event. The core elements of an event, we assume, are the verb (the action or state of the event) and the object argument (the element that is directly and critically affected by the action or state). (We follow Kratzer 1996 and assume that the subject argument is external to the event; we will return to this point later). The verb, however, is a predicative head and cannot serve as a bound variable. Thus, the only candidate left is the object argument. The semantics of *suo*, therefore, is such that it chooses a core element, namely the object argument, and checks how close the relative head

¹⁵ There are many questions with the Mandarin gapless relatives, which we cannot go into here. Zhang (2008) specifically points out that Mandarin gapless relatives do not always carry a “producing” or “causing to exist” meaning like the example under discussion. We leave the relevant questions aside.

is to it.¹⁶

There seems to be evidence for claim that *suo* introduces a focus function. Consider the following examples:

- (24) a. [Zhangsan xie de] mei-yi-ben shu dou hen
 Zhangsan write MOD every-one-CL book all very
 youqu.
 interesting
 ‘Every book that Zhangsan wrote is interesting.’
- b. [Zhangsan **suo** xie de] mei-yi-ben shu
 Zhangsan SUO write MOD every-one-CL book
 dou hen youqu.
 all very interesting
 ‘Every book that Zhangsan wrote is interesting.’
- c. Mei-yi-ben [Zhangsan xie de] shu dou
 every-one-CL Zhangsan write MOD book all
 hen youqu.
 very interesting
 ‘Every book that Zhangsan wrote is interesting.’
- d. ?Mei-yi-ben [Zhangsan **suo** xie de] shu
 every-one-CL Zhangsan SUO write MOD book
 dou hen youqu.
 all very interesting
 ‘Every book that Zhangsan wrote is interesting.’

The examples (24a) and (24b) are identical except that in (24b) *suo* occurs in the subject relative clause. The word order of the subject nominal in (24a-b) is such that the determiner-classifier phrase occurs after the relative clause, and both sentences are perfectly acceptable. In (24c-d), the word order is changed such that the determiner-classifier phrase now occurs before the relative clause, but in this case, (24d), where *suo* is present, sounds

¹⁶ We assume that the binding of the object variable involves lambda-abstraction over the object position. The lexical object is dislocated to provide the required variable. We assume that the function of *suo* has the following (much simplified) form:

(i) $\lambda P \lambda x \lambda y \exists e [(P(e, y) \wedge C(x, y)) \rightarrow \mathbf{F}(\mathbf{R}(e, x))]$

This function says that, given a propositional property P, an element *x*, and an element *y*, there is an event *e* such that, if P represents *e* and has *y* as a participant, and if *x* and *y* are close enough according to some contextually supplied measure C, then a specific relation R (that of involvement) between *e* and *x* is focalized by the function F. We further assume that if *x* and *y* are identical (as in the case of *suo* occurring with object relativization), a re-writing rule collapses lambda abstractions over *x* and *y* into one single function (in which case C(*x*, *y*) becomes trivially true).

somewhat awkward and unnatural (though perhaps still grammatical in many speakers' judgment). The contrast remains the same if other determiner-classifier phrases are used instead, such as the following:

- (25)
- | | | | | | | |
|----|--|-------------|-------------|-----------------|-----------------|------|
| a. | [Zhangsan | xie | de] | na-ji-ben | shu | dou |
| | Zhangsan | write | MOD | that-several-CL | book | all |
| | hen | youqu. | | | | |
| | very | interesting | | | | |
| | 'Those books written by Zhangsan are interesting.' | | | | | |
| b. | [Zhangsan | suo | xie | de] | na-ji-ben | shu |
| | Zhangsan | SUO | write | MOD | that-several-CL | book |
| | dou | hen | youqu. | | | |
| | all | very | interesting | | | |
| | 'Those books written by Zhangsan are interesting.' | | | | | |
| c. | Na-ji-ben | [Zhangsan | xie | de] | shu | dou |
| | that-several-CL | Zhangsan | write | MOD | book | all |
| | hen | youqu. | | | | |
| | very | interesting | | | | |
| | 'Those books written by Zhangsan are interesting.' | | | | | |
| d. | ?Na-ji-ben | [Zhangsan | suo | xie | de] | shu |
| | that-several-CL | Zhangsan | SUO | write | MOD | book |
| | dou | hen | youqu. | | | |
| | all | very | interesting | | | |
| | 'Those books written by Zhangsan are interesting.' | | | | | |

This contrast can be explained if *suo* indeed introduces a presentational focus. Huang (1982) argues that in a Mandarin nominal structure, if the determiner-classifier phrase occurs after the modifier, then the modifier is restrictive, but if the determiner-classifier phrase occurs before the modifier, then the modifier is non-restrictive. The following examples from Huang (1982: 69) demonstrate the difference:

- (26)
- | | | | | | | |
|----|--|----------|------------|------------|----------|-----------|
| a. | Niuyue, | [zheige] | [renren | dou xiaode | de] | chengshi. |
| | New York | this | everyone | all know | MOD | city |
| | 'This city, New York, which everyone knows.' | | | | | |
| b. | *Niuyue, | [renren | dou xiaode | de] | [zheige] | chengshi. |
| | New York | everyone | all know | MOD | this | city |

If Huang's (1982) proposal is correct, then the subject nominal in (24c-d) and (25c-d)

contains a non-restrictive relative clause. Non-restrictive relative clauses usually provide supplementary descriptions; this is at odd with the focus function of *suo* in (24d) and (25d), hence the unnaturalness of the sentence. If *suo* introduces presentational focus, then the element it focalizes must be the thing that is talked about and carries the most important informational load in the sentence. This is not compatible with the non-restrictive status of the relative clause in (24d) and (25d). Thus, the degradation of (24d) and (25b) appears to be a support to the claim that *suo* is a focus operator.

4.3 *Suo* and subject relativization

All previous theories on *suo* claim that *suo* is incompatible with relativization of subject (e.g. example (5b) of section 2). It is indeed true that most Mandarin speakers consider *suo* with subject relativization unacceptable or at best marginal. This phenomenon receives a natural explanation in the theory of *suo* that we propose. It has been noted by many researchers (in different theoretical approaches) that the subject argument of a sentence is external to the event; see Marzantz 1984, Larson 1988, Chomsky 1995, Kratzer 1996, Pylkkänen 2002, and many others. For example, Kratzer (1996: 121-122) proposes that the subject argument of a sentence is selected by an event argument that is distinct from the core event argument, i.e. the one that introduces the verb and the object; the two event arguments are linked through a process called Event Identification. Now, in our theory, *suo* focalizes the involvement of the relative head in the event that the relative clause denotes. But if the subject argument actually is not part of the core event, there will be no “involvement” to begin with, as the subject is external to the core event argument. Thus the focalization function of *suo* cannot apply felicitously to subject relativization. This is the source of the incompatibility of *suo* with subject relativization.

Interestingly, though, we do find some occasional examples of *suo* occurring with subject relativization. Consider the following sample sentences:

- (27) a. Xia biao qian xian chakan zhiqian **suo**
 place bid before first check preceding SUO
 goumai de **ren** de ziliao.¹⁷
 purchase MOD person MOD data
 ‘[Make sure to] check the data of the people who purchased [the merchandize]
 before making the bid.’

¹⁷ <http://www.486word.com/newpage165.htm>.

- b. Leisi de xuan-mei huodong, ruoshi bei
 similar MOD beauty.contest activity if PASS
 yange xianzhi zai xiaoyuan-zhong, **suo** canjia de
 strictly restrict at campus-in **SUO** participate MOD
xuanshou zhi xianding yu daxue-sheng qunti...¹⁸
 player only restrict at college-student group
 ‘For beauty contests of similar sorts, if they are strictly restricted as activities
 in college campuses, then those who participate in them [will] only be
 restricted to groups of college students...’

Though these examples are acceptable to some Mandarin speakers, *suo* occurring with subject relativization clearly is not a productive phenomenon. In fact, many Mandarin speakers that we consulted do not consider (27a-b) acceptable. At the present stage, we don’t have a clear explanation on the precise cause for the (un)acceptability of examples like (27a-b) to different speakers. A possibility is as follows. Speakers who consider such examples acceptable could have a “supplementary” interpretive mechanism that takes the subject-object opposition into consideration. That is, for those speakers, the transitivity exhibited by the subject-object opposition somehow is enough to serve as an indicator for the involvement of the subject argument in the overall event. Since the subject argument is necessarily involved in a transitive relation, the application of the focalization function of *suo* becomes felicitous to those speakers, and the relevant examples become acceptable. We suggest this possible explanation and leave the relevant questions to future research.

5. Concluding remarks

In this work, we argue that the element *suo* in Mandarin relative clauses is a focus operator. It exhibits a number of interesting properties, and we show that these properties can be accounted for in principled ways by the proposed theory.

However, we have not discussed the occurrence of *suo* in Mandarin *bei* passives. The following examples are repeated from (2).

- (28) a. Zhangsan bei Lisi qipian.
 Zhangsan PASS Lisi deceive
 ‘Zhangsan was deceived by Lisi.’
 b. Zhangsan bei Lisi suo qipian.
 Zhangsan PASS Lisi **SUO** deceive
 ‘Zhangsan was deceived by Lisi.’

¹⁸ http://ombrand.blog.hexun.com.tw/79557491_d.html.

At this stage, we are not completely clear about the properties of *suo* in passives. For example, *suo* seems to serve some special functions in passives that we do not observe with relative clauses. For instance, the *bei* passives prefer that the embedded predicate be of high transitivity (Li and Thompson 1981); as a result, the sentence in (29a) is degraded for lack of overt indication of high transitivity. The addition of the perfective aspect *-le* in (29b) improves the sentence. Intriguingly, the occurrence of *suo* in the sentence also improves the sentence, as in (29c). It is not clear what function *suo* is serving in such sentences.

- (29) a. ??Zhangsan bei Lisi pian.
 Zhangsan PASS Lisi cheat
 Intended: ‘Zhangsan was cheated by Lisi.’
 b. Zhangsan bei Lisi pian-le.
 Zhangsan PASS Lisi cheat-PERF
 ‘Zhangsan was cheated by Lisi.’
 c. Zhangsan bei Lisi suo pian.
 Zhangsan PASS Lisi SUO cheat
 ‘Zhangsan was cheated by Lisi.’

But still, it seems possible to apply the proposed theory to the occurrence of *suo* in passives, at least to some extent. We know that Mandarin *bei* passives sometimes permit retained objects or could even be completely “gapless” (Huang 1999, Lin 2009, 2015). But such sentences become ungrammatical when *suo* occurs. Compare the examples in (30) and (31). The two sets of examples are identical except the occurrence of *suo* in (31a-d). While all the sentences in (30) are grammatical, only (31a) is grammatical, and (31b)-(31d) are bad. In (31a), the complement clause of *bei* contains an object gap (created by the A'-movement of Op; see Huang 1999); in (31b-d), the complement clause of *bei* contains an overt object.¹⁹

- (30) a. Chuangzi bei Lisi da-po e.
 window PASS Lisi hit-break
 ‘The window was broken by Lisi.’

¹⁹ Some speakers may find the following example only mildly degraded:

- (i) ?Juzi bei Zhangsan suo bo pi.
 tangerine PASS Zhangsan SUO peel skin
 Intended: ‘The skin of the tangerine was peeled off by Zhangsan.’

We suggest that this may have resulted from reanalysis of the expression *bo pi* ‘peel-off skin’ as a compound verb taking *juzi* ‘tangerine’ as its object.

- b. Zhangsan bei Lisi da-duan tui.
 Zhangsan PASS Lisi hit-break leg
 ‘The leg of Zhangsan was broken by Lisi.’
- c. Zhangsan bei Lisi da-chu yizhi chuanleida.
 Zhangsan PASS Lisi hit-out one.CL homerun
 ‘Lisi hit a homerun on Zhangsan.’
- d. Zhangsan bei Lisi mai-zou naxie shu.
 Zhangsan PASS Lisi buy-away those book
 ‘Lisi bought those books away on Zhangsan.’
- (31) a. Chuangzi bei Lisi suo da-po *e*.
 window PASS Lisi SUO hit-break
 ‘The window was broken by Lisi.’
- b. *Zhangsan bei Lisi suo da-duan tui.
 Zhangsan PASS Lisi SUO hit-break leg
 Intended: ‘The leg of Zhangsan was broken by Lisi.’
- c. *Zhangsan bei Lisi suo da-chu yizhi chuanleida.
 Zhangsan PASS Lisi SUO hit-out one.CL homerun
 Intended: ‘Lisi hit a homerun on Zhangsan.’
- d. *Zhangsan bei Lisi suo mai-zou naxie shu.
 Zhangsan PASS Lisi SUO buy-away those book
 Intended: ‘Lisi bought those books away on Zhangsan.’

Now let us apply the proposed theory of *suo* to the examples (31a-d). We start with (31a). The LF structure of (31a) is as (32) (after the LF movement of *suo*).

- (32) Chuangzi bei [TP Op₁ [TP suo [TP Lisi da-po *e*₁]]]
 window PASS Lisi hit-break

In this structure, Op moves from the embedded object position to the embedded TP, and *suo* also moves to the embedded TP in LF. Suppose that *suo* focalizes the involvement of Op (the equivalent of the relative head in the case of relativization) in reference to a core element of the event *da-po* ‘hit-break’, in this case the object empty category *e*. Since Op is closely related to *e* -- they are in fact identical -- the focalization of *suo* is felicitous. The situation is essentially the same as *suo* occurring with object relativization.

Next we look at (31b). The LF structure is (33). According to Huang (1999), in *bei* passives with a retained object, the empty operator Op is base-generated at Spec of VP, from

- Now we apply the focus function of *suo* to (33). Note that in this case there is no object empty category, so there is no argumental variable and the focus function of *suo* lacks the required reference. Note further that the trace of the moved Op cannot serve as the argumental variable to be bound by *suo*, because it is not a core element of the event -- it is just the possessor of a core element of the event. Op denotes the possessor of the embedded object *tui* 'leg' and hence does not bear any direct relationship with the event of hitting-breaking (even though in reality the possessor is the real sufferer of the event). So the sentence (31b) is ungrammatical for lack of the required reference.

Lastly, we look at (31c) and (31d). Their LF structures are (34) and (35). According to Lin (2009, 2015), in such sentences Op is base-generated at the embedded TP binding the weak NP object ((34)) or the tense ((35)) of the embedded TP. Again, there is no object empty category, and no argumental variable. This would be enough to make the occurrence of *suo* ungrammatical.

- The above discussion, therefore, indicates that the proposed theory of *suo* may at least partially account for the occurrence of *suo* in Mandarin *bei* passives. We will leave further discussion of the relevant questions to future studies.

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