

Abstract

Why does an argument clause contain a meaningless complementizer in languages such as English and German, but not in Mandarin; and why does an adverbial clause occur with a meaningless correlative adverb in the matrix clause in Mandarin, but not in languages such as English and German? Extending the c-selection from one type of sisterhood to another type of sisterhood, this paper recognizes the modification relation as a kind of selection relation, in addition to the familiar kind of argument-taking selection relation. This research argues that dependency marking is seen in different types of sister relations. It shows how Mandarin uses modification markers systematically, but does not use argument markers, also systematically. The paper explains the existence of modification markers in various constructions in Mandarin and in various languages. It lets us gain a better understanding of language variations.

Keywords

correlative adverb, selection marker, argument-taking, modification, adverbial clause

1. Two empirical issues

This paper links two empirical issues together and explains both of them. First, in languages such as English and German, a complementizer occurs with an argument clause by default. For a declarative finite argument clause, the complementizer is *that* in English and *dass* in German, as shown in (1a). In contrast, no complementizer in any form is allowed for an argument clause in Mandarin, as seen in (1b).¹

- (1) a. *Er glaubt, dass der Virus verschwinden wird.*
he thinks that the virus disappear will
'He thinks (that) the virus will disappear.'
- b. *Ta renwei bingdu hui xiaoshi.*
he think virus will disappear
'He thinks the virus will disappear.'

Second, in Mandarin, an adverbial clause not only is headed by a complementizer, such as *ruguo* 'if' in (2a), as in other languages, but also always allows or requires a correlative adverb (Chao, 1968: 114) to occur in the modified clause, and the form of the adverb must be compatible with the semantic type of the adverbial clause. For example, the conditional adverbial clause is paired with *jiu* 'then' in (2a), the causal adverbial clause is paired with *cai* 'therefore' in (2b), and the concessive adverbial clause is paired with *haishi* 'still' or *rengran* 'still' in (2c). In contrast, no such a systematic pairing is seen in languages such as English and German, as seen in the translations in (2). Although the word *then* may (but is not required to) occur in an English conditional construction, as seen in the translation of (4) below, there is no systematic correlative adverb in adverbial clause constructions in English.²

¹ *Shuo* 'Lit.: say' might precede a clausal complement, but we do not consider it in this paper for two reasons. First, it is used in certain Chinese dialect, but not in the dialects of my informants. Second, even for those people who use it in this way, it can never introduce a subject clause. Thus, its status is different from a complementizer such as *that* in English. See Huang (2018: Appendix) for a review of the research on this use of *shuo*.

² CL: classifier; DE: modification; IMP: imperative; PRF: perfective aspect; PRG: progressive aspect; TOP: topic.

- (2) a. *Ruguo ta lai-le, wo *(jiu) likai.* (conditional)
 if he come-PRF I then leave
 ‘If he has come, I’ll leave.’
- b. *Yinwei ta lai-le, wo *(cai) likai.* (causal)
 because he come-PRF I therefore leave
 ‘Because he came, I left.’
- c. *Suiran ta lai-le, wo *(haishi/rengan) yao likai.* (concessive)
 although he come-PRF I still/still want leave
 ‘Although he came, I (still) want to leave.’

We thus see pairs of formatives in adverbial clause constructions in Mandarin. Some such pairs are listed in (3) (e.g., Zhu, 1982: 218; Lü, 1999: 28, Zhou, 2002: §4; Wei & Li, 2018: 188).³

- (3) a. *jiran ... jiu* ‘since ... then’ b. *yaoshi ... jiu* ‘if ... then’
 c. *ruguo ... jiu* ‘if ... then’ d. *zhiyao ... jiu* ‘if only ... then’
 e. *yi ... jiu* ‘once ... then’ f. *jishi ... ye* ‘even.though ... still’
 g. *jinguan ... ye* ‘although ... still’ h. *yinwei ... cai* ‘because ... thus’
 i. *chufei ... cai* ‘unless ... then’ j. *buguan ... dou* ‘regardless ... also’
 k. *jinguan ... haishi* ‘although ... still’ l. *suiran ... haishi* ‘although ... still’
 m. *suiran ... que* ‘although ... however’

When there are multiple adverbial clauses, each of them is associated with a correlative adverb in the modified clause by default. In (4), the *ruguo*-clause is associated with *jiu* ‘then’, and the *jishi*-clause is associated with *ye*.

- (4) [*Ruguo ni shu-le*], *wo jiu* [*jishi ni ku*] [*ye bu bang ni*].
 if you lose-PRF I then even.if you cry still not help you
 ‘If you lose, then even if you cry, I would not help you.’

A correlative adverb is always allowed, and usually required, to show up in an adverbial clause construction in Mandarin. But in certain cases, it can be dropped. In (5a) (adapted from Wei & Li, 2018: 193 (54)), the correlative adverb *jiu* ‘then’ is optional. On the other hand, when a correlative adverb occurs, the left part of the pairs in (3) can be optional. In (5b), *jiu* occurs in the second clause and *ruguo* ‘if’ in the first clause is optional. This further shows that the occurrence of a correlative adverb alone signals the modification relation between two clauses (also see Paul & Pan, 2018: fn. 17).

- (5) a. *Ruguo pro mei-you tongguo zheicikaoshi, meige xuesheng*
 if not-have pass this exam every student
 (*jiu*) *dou bixu chongxin canjia kaoshi.*
 then all must again participate exam
 ‘If *pro*_i does not pass the exam, every student_i must take the exam again.’

³ A correlative adverb may interact with other formatives in a clause. In (i), for example, *jiu* is not allowed in the presence of *shi...de*, unlike in (2a). In this paper, we discuss the basic constructions, which do not have *shi...de*.

(i) *Ruguo mingtian xia yu, wo (*jiu) shi bu hui qu de.*
 if tomorrow fall rain I then be not will go DE
 ‘If it rains tomorrow, I will not go there.’

- b. (*Ruguo*) *xiayu*, *women* *jiu dai zai jia-li*.
 if rain we then stay at home-in
 ‘If it rains, we stay at home.’

The basic empirical issue here is that the absence of a correlative adverb in the matrix clause may cause unacceptability in general in Mandarin, but does not cause ungrammaticality in languages such as English.

Importantly, this use of correlative adverbs in adverbial clause constructions is different from the use of the adverbs of the same forms in single clauses. In (6), which has no adverbial clause, *cai* ‘only’ is not a correlative adverb. Such a meaningful adverb in single clauses has been studied by many scholars (e.g., Lai, 1999, Hole, 2004; also see our §2.2 and §4.2).

- (6) *Ta liu dian cai lai*.
 he six o'clock only come
 ‘He did not come until six o’clock.’

Why does a clause contain an extra meaningless element whenever it is an argument of another element in languages such as English and German, but not in Mandarin; and why does a clause contain an extra meaningless element whenever it is modified by another clause in Mandarin, but not in languages such as English and German? The two contrasts are not trivial, but no explanation is seen in the literature yet. They call for an account in any syntactic framework.

In §2, I use a new selection theory to explain the existence of the two kinds of extra elements. In §3, I explore the syntactic properties of the constructions like those in (2), and explain the presence and absence of a correlative adverb in other similar constructions. Then, in §4, I explain the presence and absence of a correlative adverb with certain major types of right-edge embedded clauses. §5 shows that the two contrasts reported here are not accidental, since they correlate with the syntax of other parts of the languages, and modification markers are also found in other languages. §6 concludes.

2. From Bruening’s (2010) selection theory to the selection marking patterns

In this section, we introduce two kinds of selection and their markers (2.1), and then introduce certain general properties of selection markers (2.2).

2.1 Two kinds of selection and selection markers

The two contrasts introduced at the beginning of §1 can be related. Descriptively, if a clause is an argument of another element, the argument-taking dependency is marked by some formative in some languages, but not in others; on the other hand, if a clause is modified by another element, the modification dependency is also marked by some formative in some languages, but not in others.

In syntax, a selectional relationship means one element depends on another element in a certain sense. Category selection (c-selection) means one element must be merged with another element of a certain specific syntactic category (e.g., N, V). Bruening (2010: 533) proposes that “there is a selectional relationship between modifiers and what they modify, such that the modifier selects the category it modifies. It is clear that adjectives only occur with elements of category N, while adverbs only occur with elements of category V; I view this as an instance of categorial selection.” (7) and (8) are stated in Bruening (2010: 534).

(7) Selectors

- a. Modifiers: A(P), Adv(P)

- b. Argument takers: C, T, Asp, Appl, V, P, N, ...
- (8) Principles of Projection

- a. If X selects and merges with Y and X is an argument taker, X projects.
- b. If X selects and merges with Y and X is a modifier, Y projects.

Selectors have long been assumed to be argument takers, and thus (7b) is not new. But modifiers have not been assumed to be selectors in the literature, and thus (7a) is new. We can add more types of modifiers to (7a), such as adverbial clause and relative clause. The content in (8a) is also not controversial. The projection issue in (8b) is a labelling issue. If XP and YP are sisters, Chomsky (2013: 43-46) discusses two possible labelling mechanisms: one is that one of the phrases moves, and then the remaining one decides the label of the whole construction; and the other is that XP and YP share a certain feature, which provides the same label for the whole construction. But neither of these applies to the adjunction relation, which represents a modification relation. If XP modifies YP, neither needs to move, and they don't have to share any features. (8b) reflects the common understanding that it is the modified element that decides the label of the pair merge.

In both an argument-taking and a modification selection, there is a syntactic and semantic dependency between two elements. Both dependencies are established between two sisters in their base-positions. Unlike other kinds of syntactic dependencies, this sisterhood relation is the most local one. The generalized selection theory in (7) captures the sensitivity of one sister to the other sister with respect to syntactic categories, a syntactic reality. On the other hand, (8) tells us one syntactic difference between the two kinds of selection, with respect to the projecting possibility. Semantically, the argument-taking selection can trigger the operation Function Application, and the modification selection can trigger the operation Predicate Modification.

Accordingly, we specify that in Mandarin, an adverbial clause c-selects a verbal projection on the functional projection sequence of the clausal spine of the matrix clause (see 3.1).

From the perspective of the generalized selection in (7) and (8), it is possible for either kind of the selection relations to be overtly marked by certain formatives in some languages. We can view the two contrasts presented in §1 as two different selection marking patterns. In (1a), a selection marker (SM) occurs in the argument-taking selection, and in (2), an SM occurs in the modification selection. The SM is a complementizer in the former, but a correlative adverb in the latter.

This explains why the complementizer *that* occurs in English, and why a correlative adverb occurs in Mandarin. Different languages may implement one of the two selection marking strategies. Also, since the two kinds of dependencies do not conflict with each other, theoretically, we do not exclude the possibility that in some languages, both or neither kinds of dependencies exhibit overt marking. Our empirical task in this paper, however, is to reveal the existence of the marking of the modification type. We investigate the properties of the SMs in the modification dependency, by case studies.

2.2 General properties of SMs

We now present four major aspects of modification selection marking seen in adverbial clause constructions in Mandarin, compared with the selection marking seen in argument-taking constructions in languages such as English and German.

First, both a complementizer and a correlative adverb are correlative elements. If we treat the complementizers *that* in English and *dass* in German as SMs, their absence in a single clause is explained: there is no selection relation between the clause and another element. If there is no selection relation, there is no SM. No additional stipulation on the

- (12) a. *{Ruguo/*Zhiyou} ta qu dehua, wo jiu qu.*
 if/if.only he go if I then go
 ‘If he goes, I will go.’
- b. *{Zhiyou/Ruguo} ta qu dehua, wo cai qu.*
 if.only/if he go if I then go
 ‘If only he goes, I will go.’
- (13) a. *Ta qu dehua, wo jiu qu.*
 he go if I then go
 ‘If he goes, I will go.’
- b. *Ta qu dehua, wo cai qu.*
 he go if I then go
 ‘If only he goes, I will go.’

Since SMs do not add any meaning to the whole construction, their systematic absence in a certain type of selection does not affect the meaning of the construction. Cross-linguistically, a language with one type of selection marking is not semantically affected, in the absence of the other type of selection marking. In Wei & Li (2018: 283), correlative adverbs are analysed as “contrastive-marking adverbs”. Modifiers host focus, not only in Mandarin, but also in other languages. Treating correlative adverbs as a certain type of focus markers does not explain why there is no systematic pairing of an adverbial clause and a correlative adverb in languages such as English and German.

We therefore see that neither the complementizer *that* in English nor correlative adverbs in Mandarin contribute any meaning to the constructions. This is a shared property of the two kinds of SMs. SMs are not lexical elements, and thus they do not have to encode any meaning.

On the other hand, subordinate complementizers such as *because* and *if* do have semantic content, and they are not SMs. Moreover, one might assume that instead of a correlative, it is the conjunction that introduces the matrix clause (e.g., *name* ‘then’ in (14a) and *danshi* ‘but’ in (14b)) that is an SM. But the fact is that even in the presence of such a conjunction, a correlative adverb can still be obligatory, as seen in (14). Thus, we claim that it is the correlative adverb that is an SM. We will discuss such coordinate constructions in 3.3.

- (14) a. *Ruguo ta lai-le, (name) wo *(jiu) likai.*
 if he come-PRF then I then leave
 ‘If he has come, I’ll leave.’
- b. *Suiran ta lai-le, (danshi) wo *(haishi/rengan) yao likai.*
 although he come-PRF but I still/still want leave
 ‘Although he came, I (still) want to leave.’

Also, correlative adverbs are few and not productive. They form a closed set in Mandarin. Zhou (2002: §4) tries to list all possible pairs like those in (3). In his work, he considers the correlative adverbs *jiu*, *ye*, *cai*, and *dou* only.

Fourth, under certain conditions, a complementizer can be dropped in English (e.g., if the embedded clause is not a subject clause, as seen in *that* in the translation of (1a); see Bošković & Lasnik, 2003; Dor, 2005; Jaeger, 2010; Bîlbîie, 2020); and so can be a correlative adverb, as seen in *jiu* in (5a). Since correlative adverbs can always occur or must occur in adverbial clause constructions in Mandarin, their occurrence in such constructions is the default situation. Rather than exploring the conditions of the dropping of correlative adverbs, in this paper, I discuss why this kind of elements exists by default in certain languages but not in some other languages, in order to understand their status in the language system.

Finally, s-selection may occur together with c-selection. We introduced the notion of c-selection in the second paragraph of 2.1. S-selection means that one element must be merged with another element of a certain semantic property. For example, verbs like *inquire* s-select an interrogative clause, instead of a declarative clause. Similarly, s-selection may also occur between a modifier and the modified element. It is well-known that an instrument adverbial cannot modify a stative predicate. In adverbial clause constructions in Mandarin, an adverbial clause may also s-select the modified matrix clause. Although an SM does not express any meaning (see the third point above), it can distinguish some basic semantic relations. The s-selection in a modification relation can be attested in the compatibility of the two parts of a pair in (3). For example, the two parts in (3a) are not exchangeable with those in (3b) (*jiran ... {jiu/*haishi}*; *suiran ... {haishi/*jiu}*). See Kuo (2020) and Xu (2020) for studies of choices of correlative adverbs in conditional clause constructions in Mandarin.

In this section, I have basically given a unified account of the existence of the two contrasts presented in §1, from a new perspective of the selection theory.

3. Syntagmatic properties of SMs in adverbial clause constructions

In this section, I discuss the positions of an adverbial clause with respect to the modified matrix clause, the position of an SM, the presence of an SM in a paired-conjunction construction, and the absence of a relevance adverbial clause construction. All of these are about the syntactic contexts of an SM, rather than the internal structure of an adverbial clause. For the latter issue, one can see Pan & Paul (2018) and Wei & Li (2018).

3.1 The base-position of an adverbial clause

By default, an adverbial clause is left-adjoined to the structure of the matrix clause in Mandarin (e.g., Pan & Paul, 2018, Wei & Li, 2018). In this subsection, we discuss the exact base-position of such an adverbial clause in the whole construction.

I claim that an adverbial clause in Mandarin can be merged below the surface position of the subject of the matrix clause, and then may move to a topic position if it surfaces at the left-peripheral position (see Gasde & Paul, 1996), as seen in (2). The possibility for an adverbial clause to be merged to a TP-internal position is addressed in Pan & Paul (2018), but no conclusive argument is given there. Consider the example in (15).

- (15) *Henshao ren [yinwei xiayu] jiu bu qu shangban.*
 few person because rain then not go work
 ‘Few people do not go to work because it rains.’

Assume that as in many languages, a subject moves from vP to SpecIP in Mandarin (Huang, 1993). As for a topic, it must either be referential or denote a pure cardinality (Li, 1998). But a quantificational nominal such as *henshao ren* ‘few people’ does not satisfy either of these two conditions and thus it cannot be base-generated or move to a topic position (Ko, 2005: 6). The example in (15) shows that an adverbial clause can follow a DP that is unable to be a topic in the matrix clause. If such a subject surfaces at SpecIP of the matrix clause, the adverbial clause to its right should be merged lower than the IP. It may adjoin to vP or to some projection between IP and vP. The base-position of such an adverbial clause is shown in (16).

- (16) [_{Matrix-IP} DP [_I⁰ ... [_{adv.cl.} ...] SM [_{vP} <DP> ...]]]

If an adverbial clause cannot follow *henshao ren*, or any other DP that is unable to be a topic, then, it can be base-generated higher than the IP of the matrix clause. In (17a), the

yaoshi ‘if’ adverbial clause precedes *henshao ren*. In (17b), however, the adverbial clause follows *henshao ren*, and the example is not acceptable. In (17a), the adverbial clause is base-generated higher than the IP of the matrix clause, at a topic position (see Gasde & Paul, 1996), and *henshao ren* surfaces in the subject position, as in (15). Since the adverbial clause is at a topic position and *henshao ren* cannot be a topic, there is no way for the latter to precede the former. Thus, (17b) is not acceptable.

- (17) a. [Yaoshi tianqi hen leng dehua] henshao ren lai mai
 if weather very cold if few person come buy
 bingqilin.
 ice.cream
 ‘If the weather is very cold, few people come to buy ice-cream.’
- b. *Henshao ren [yaoshi tianqi hen leng dehua] lai mai
 few person if weather very cold if come buy
 bingqilin.
 ice.cream

Regardless of whether an adverbial clause is base-generated below the surface position of a subject (as in (15)) or above the surface position of a subject (as in (17a)), according to (8b), the modified part, i.e., the predicate of the matrix clause, projects. The adverbial clause is not among the functional projections of the clausal spine of the matrix clause.

3.2 The position of an SM

We now consider the position of an SM. Since an SM occurs in the selected element, it is part of the latter syntactically. We have observed that an SM is c-commanded by the selector. Obviously, a complementizer such as *that* in English or *dass* in German is c-commanded by the selecting verb, as seen in (1a). A correlative adverb, as an SM, must also be c-commanded by an adverbial clause. If there are multiple adverbial clauses, each SM must be c-commanded by its associated adverbial clause. In (18a) (= (4)), for example, the *ruguo*-clause c-commands its associated SM *jiu* ‘then’, and the *jishi*-clause c-commands its associated SM *ye*. Exchanging the positions of the two SMs causes unacceptability, as shown in (18b). This captures the fact that an SM occurs in the selected element (the second point of 2.2).

- (18) a. [Ruguo ni shu-le], wo jiu [jishi ni ku] [ye bu bang ni].
 if you lose-PRF I then even.if you cry still not help you
 ‘If you lose, then even if you cry, I would not help you.’
- b. *[Ruguo ni shu-le], wo ye [jishi ni ku] [jiu bu bang ni].

Within the modified clause, a correlative adverb has the same distribution as other postsubject adverbs in the language, occurring to the left of a verbal phrase (see Li & Thompson, 1981: 633). Assume that an auxiliary such as *shi* ‘be’ is at I and so is its interrogative form *shi-bu-shi* (Huang, 1988). We find that the position of a correlative adverb must be lower than *shi-bu-shi*, as shown in (19). Thus, a correlative adverb occurs between I and vP (a modal verb, such as *bixu* ‘must’ in (5a), is a control verb, also surfacing at v; see Lin & Tang, 1995), and is c-commanded by the adverbial clause.

- (19) a. Ruguo xiayu, ni shi-bu-shi jiu dai zai jia-li?
 if rain you be-not-be then stay at home-in
 ‘If it rains, do you stay at home?’

- b. **Ruguo xiayu, ni jiu shi-bu-shi dai zai jia-li?*
 if rain you then be-not-be stay at home-in

Furthermore, a complementizer such as *that* in English and *dass* in German heads a functional projection in the C-domain of an argument clause. But correlative adverbs are adjuncts of vP. They do not project, and thus, no additional functional projection occurs. In this analysis, no additional functional category, such as ModP (see Rubin, 2003), is necessary. Also, no additional stipulation is needed to label a modification structure (see Hornstein & Nunes, 2008; Blümel & Pitsch, 2019). In the argument-taking dependency, there is no ArgumentP, either (we also do not need Jackendoff's 1977: 32 [+/-subject] or [+/-object] features).

3.3 The SMs in paired-conjunction constructions

In addition to the adjunction constructions discussed in 3.1, correlative adverbs also occur in paired-conjunction constructions (e.g., Wei & Li, 2018: 189):⁴

- (20) a. *Budan Mali lai-le, erqie Masha *(ye) lai-le.*
 not.only Mary come-PRF but.also Masha also come-PRF
 'Not only Mary came, but also Masha came.'
- b. *Suiran tianqi hen hao, dan ta *(haishi) dai-le yusan.*
 although weather very good but he still bring-PRF umbrella
 'Although the weather is good, he still brings an umbrella.'

According to Wei & Li (2018: 190-193), if both an adverbial clause and the matrix clause are introduced by a conjunction, forming a pair, such as [*budan ... erqie ...*] 'not only ...but also' in (20a) and [*suiran ... dan ...*] 'although ... but ...' in (20b), the whole construction has a coordinate structure, headed by the coordinator, such as *erqie* or *dan*. In such a construction, if the first clause modifies the second one, it is not an adjunct of the later. In (20a), for example, the first clause is an Spec element in the coordinate structure, instead of an adjunct. However, in both an adjunction structure and a coordinate structure, the first element and the rest are sister phrases. We now explain the basic syntactic and semantic relation between the two clauses in a paired-conjunction construction such as (20a) and (20b), and explain why an SM occurs there.

In English, the fact that a clausal coordinate construction may express a modification relation is well-known (Culicover & Jackendoff, 1997). In (21), the first clausal conjunct is a conditional modifier of the second clausal conjunct, and thus the example is synonymous to *If you drink one more can of beer I'm leaving*.

- (21) *You drink one more can of beer and I'm leaving.*

If a coordinate construction has a complementation structure headed by the coordinator, we assume that a semantic modification relation can be expressed by such a syntactic structure, in addition to an adjunction structure, although this possibility has been observed in

⁴ I use the general term 'conjunction' to cover both the complementizers that introduce adverbial clauses, such as *if*, and the formatives that link two conjuncts, such as *and*, *but*. The latter is also called coordinator.

The parhypotaxis construction seen in (20a/b) is also seen in other languages, e.g., old Romance, as in (i), Swahili, Zamucoan languages, and the Iranian language Sogdian (Franco, 2013: 62-64 and the references there).

(i) *S' io dissi il falso, e tu falsasti il conio.*
 if I say.1SG.PST the false and you alter.2SG.PST the minting.die
 'If I said something false, you (did worse, for you) altered the minting die.'

Old Italian (Dante Alighieri, *Commedia*, Inf., 30.115)

- (25) a. *Ruguo ni yao zhao Yani, ta (*jiu) tongchang zai tade bangongshi-li.*
 if you want find Yani she then usually at her office-in
 ‘If you want to find Yani, she is usually in her office.’
- b. *Yaoshi ni ke dehua, bingxiang-li (#jiu) you guozhi.*
 if you thirsty if fridge-in JIU have juice
 ‘If you are thirsty, (*in that case) there is juice in the fridge.’

Relevance conditionals are not hypothetical conditionals. The latter is part of the assertion made by the matrix clause, but the former is not (Iatridou, 1991: 52). There is in fact a hidden part before the apparent consequent clause: “I tell you that”, and the apparent conditional clause is the condition of the whole string that contains this hidden part. As seen in (26), if we make this hidden part explicit, the correlative adverb *jiu* appears, in the real matrix clause.

- (26) a. *Ruguo ni yao zhao Yani, name wo jiu gaosu ni ta tongchang zai tade bangongshi-li.*
 then I then tell you
 ‘If you want to find Yani, I tell you that she is usually in her office.’
- b. *Yaoshi ni ke dehua, name wo jiu gaosu ni bingxiang-li you guozhi.*
 ‘If you are thirsty, I tell you that there is juice in the fridge.’

We can see that the SM *jiu*, together with *name* ‘then’, occurs in the modification relation between the conditional clause and the real modified part, as expected. However, since the two clauses in (25a) and (25b) do not have a modification relation, the ban of an SM is also expected.

In this section, I have given a syntactic analysis of the selection marking of the dependency between an adverbial clause and the matrix clause, and then explained why an SM occurs in a paired-conjunction construction, but not in a relevance adverbial clause construction.

4. SMs and various types of apparent sentence-final adverbial clauses

In this section, I explain the possible and impossible presence of an SM with certain major types of postverbal embedded clauses.

4.1 Sentence-final embedded clauses that are complement clauses

The postverbal embedded clauses that are headed by *de* (得) ‘such that’, as in (27a), and *lai* ‘in order to’, as in (27b), do not have any correlative adverbs in the matrix clause (See Liao & Lin, 2019 and Wei & Li, 2018 for other types of postverbal-only embedded clauses).

- (27) a. *Yani wan-de danwu-le yi jian zhongyao de shiqing.*
 Yani play-DE miss-PRF one CL important DE thing
 ‘Yani played so much such that she missed an important thing.’
- b. *Yani zuo-le kouzhao lai song pengyou.*
 Yani make-PRF mask in.order.to give friend
 ‘Yani made masks in order to give them to her friends.’

Such postverbal embedded clauses are widely recognized as the complement of the verb of the matrix clause (e.g., Sybesma, 1999 and Yafei Li, 1999 for resultatives and Liao & Lin, 2019 and Wei & Li, 2018 for purposives). We can add one more argument to the complement

analyses. In such constructions, the negation of the matrix predicate can license the non-question reading of a *wh*-expression in the postverbal clause, as shown in (28). Since such a licensing needs a *c*-commanding structure (Li, 1992), the possible licensing of the non-question readings of the *wh*-expressions in (28) indicates that in such a construction, the matrix predicate *c*-commands the embedded clause, and thus it is impossible for the latter to be a right-adjunct of the matrix clause.

- (28) a. *Yani meiyou wan-de danwu-le shenme zhongyao de shiqing.*
 Yani not play-DE miss-PRF what important DE thing
 ‘Yani did not play so much such that she missed any important thing.’
- b. *Yani meiyou zuo kouzhao lai song shenme-ren.*
 Yani not make mask in.order.to give what-person
 ‘Yani did not make masks to send to anyone.’

In (27b), *lai* can be a complementizer, but it does not seem to be an SM for an argument-taking selection. Unlike the SM *that* in English, *lai* is banned from subject clauses and non-purposive embedded clauses. In (29), the subject clause rejects *lai*, but its English translation requires *that*.

- (29) [*(*Lai)* *Yani zhaodao-le gongzuo*] *shi yi jian hao shi.*
 in.order.to Yani find-PRF job be one CL good thing
 ‘*(That) Yani has found a job is a good thing.’

Thus, *lai* cannot be an SM. Instead, it introduces a purposive subordinate clause. The same is true of the *de* in (27a), which introduces a resultative clause (this *de* is different from the *de* to be discussed in 5.1). Both *lai* and the *de* here select a clause, but they themselves are not SMs of any kind of selection.

Since such postverbal embedded clauses are not modifiers, the absence of an SM for a modification selection in the matrix clause is expected.

4.2 Sentence-final embedded clauses that are stranded by movement

A second type of apparent sentence-final adverbial clauses is the marked versions of the corresponding sentence-initial adverbial clauses. (30a) is unmarked and (30b) is marked (Pan & Paul, 2018: (74) and (73)). According to Pan & Paul (2018: sec. 3.2.1), based on the order in (30a), “if we now change the order and put the inferential clause in the sentence final position, no notable semantic difference ensues.”

- (30) a. *Jiran ni dou lai-le, ni jiu bang wo zuo dian shi ba.*
 since you already come-PRF you then help I do a.bit thing IMP
 ‘Since you have already come, you should help me to do something.’
- b. *Ni jiu bang wo zuo dian shi ba, jiran ni dou lai-le.*
 Both a and b: ‘You might as well give me a hand, since you are here.’
- (31) a. *Jiran ni yiding yao qu, wo ye bu fandui.*
 since you certainly want go I also not oppose
- b. *Wo ye bu fandui, jiran ni yiding yao qu.*
 Both a and b: ‘Given that you want to go anyway, I will not oppose you.’

Wei & Li (2018) argue that examples like (30b) and (31b) are derived from their canonical counterparts, i.e., examples like (30a) and (31a), via the leftward movement of the main clause across the adverbial clause. From our perspective, in addition to the synonymous

relation between (30a) and (30b), and the synonymous relation between (31a) and (31b), one more argument can support the movement analysis. In the canonical (30a), *jiu* is an SM, and thus it does not express meaning independently (2.2). If *jiu* is not an SM, it can have various meanings (see Hole, 2004). For instance, it can mean ‘only’ in (32a). But the two possible readings of (32a) are absolutely not possible in (30a). Importantly, (30b) does not have these readings, either. This shows that *jiu* in (30b) is also an SM. If an SM must be c-commanded by the selector (3.2), and the SM *jiu* in (30a) is c-commanded by the *jiran*-clause, *jiu* in (30b) must also be c-commanded by the *jiran*-clause in a certain step of the derivation. If the matrix clause in (30b) is reconstructed back to a lower position, the *jiran*-clause is able to c-command *jiu*. This reconstruction effect supports the movement analysis. (31b) shows a similar reconstruction effect. If the adverb *ye* is not an SM, it can mean ‘also’, as seen in the two possible readings of (32b). But the two readings are absent not only in (31a), but also in (31b). Again, the reconstruction effect supports the movement analysis.

- (32) a. *Ni jiu bang wo zuo dian shi ba.*
 you then help I do a.bit thing IMP
 Possible reading A: ‘Among many things you can do, you can just help me to do something (instead of travelling all the time).’
 Possible reading B: ‘Among many people you can help, you can just help me to do something (instead of helping others).’
- b. *Wo ye bu fandui.*
 I also not oppose
 Possible reading A: ‘In addition to other people, I also do not oppose it.’
 Possible reading B: ‘In addition to other things, I do not oppose this, as well.’

Since the matrix clause is fronted, as expected, the contained SM in the a-examples is kept in the b-examples in (30) and (31). Thus, the modifier status of this type of embedded clause explains the presence of an SM for the modification selection.

4.3 Sentence-final embedded clauses that are not modifiers of the preceding clauses

A third type of apparent sentence-final adverbial clauses is exemplified in (33c), in the context of (33a) (Wei & Li, 2018: 288). (33b) is a canonical modification construction, in which the SM *jiu* is required to occur in the matrix clause. In (33c), the left clause has the same form as the matrix clause in (33b), except that no SM is allowed; and the right clause has the same form as the conditional adverbial clause in (33b).

- (33) a. *Wo zaoshang tongchang qu paobu.*
 I morning usually go jogging
 ‘I usually go jogging in the morning.’
- b. *Dan ruguo xiayu, wo *(jiu) bu qu.*
 but if rain I then not go
 ‘But if it rains, I won’t go.’
- c. *Dan wo *(jiu) bu qu, ruguo xiayu.*
 but I then not go if rain
 ‘But I won’t go, if it rains.’

Before we discuss (33c), let us see the following dialogue (Zhu, 1982: 217). As pointed out by Zhu, the conjunction *keshi* ‘but’ in B’s statement is linked to A’s.

- (34) A: *Jintian feng zhen da.* B: *Keshi bu zenme leng.*
 today wind really big but not how cold
 ‘It’s windy today.’ ‘But it’s not very cold.’

In both (33b) and (33c), the conjunction *dan* ‘but’ occurs at the left edge, similar to *keshi* in (34B). There are two possible structures. One is that this *dan* takes (33a) as the first conjunct, and takes the whole string to its right as the second conjunct. Another possibility is that the second conjunct linked by *dan* is only the first part of the string to its right.

Wei & Li (2018: 288) argue that (33b) is a canonical construction. The constituency of the string to the right of *dan* is (35a). This is the first possibility mentioned above. They argue that in (33c), however, the initial *dan*-clause is independent of the following *ruguo*-clause. In other words, the latter is not a modifier of the former. This is the second possibility mentioned above: for *dan*, the first conjunct is still (33a) but the second one is just *wo bu qu* ‘I won’t go’; and the rest of (33c) is from another construction. One analysis of the constituency of (33c) is (35b), where CP1 is independent from CP2. In this structure CP1 has no modifier, and CP2 has its own matrix clause that is modified by the *ruguo* clause, but this matrix clause is deleted.

- (35) a. [[CP1 *ruguo* ...], [CP2 ... *jiu* ...]]
 b. [CP1 ...], [CP2 [*ruguo* ...] [~~CP ... *jiu* ...~~]] (see Wei & Li, 2018: 288)

In (35b), the deletion of the matrix clause in CP2 takes CP1 as its antecedent, although CP1 does not have the SM *jiu*. In 2.2 we have argued that SMs have no semantics. Meaningless formatives need not be considered in ellipsis. In the gapping construction *John drinks wine and his kids _ cola*, the deleted verb is *drink*, rather than *drinks*. The inflection difference between *drink* and *drinks*, a pure formal contrast, is ignored in the deletion. Similarly, the SM *jiu* is also ignored in the deletion in (35b).

In (35b), the deleted clause contains the SM *jiu*; but since the clause is deleted, this *jiu* is invisible. In contrast, CP1 has no modifier, and thus, no correlative adverb, i.e., SM, is allowed, as expected. Thus, the absence of a modification relation between the two visible clauses in a construction like (33c) explains the absence of a SM for modification selection.

In this section, I have shown that if the postverbal embedded clause is a complement of the verb of the matrix clause, instead of being a modifier, no correlative adverb, which is a modification SM, is allowed; if a right-edge embedded clause is stranded by a movement, and the modification relation is established before the movement, a correlative adverb does occur; and finally, if an apparent right-edge embedded clause has no modification relation with the clause to its left, no correlative adverb is allowed. All of these are predicted from the SM analysis of correlative adverbs, proposed in §2.

5. SMs and some other modification constructions in Mandarin and beyond

Selection marking for the modification selection is generally available in Mandarin, and hence the existence of an SM in adverbial clause constructions is not accidental. In this section, I discuss two issues: the *de*-modification constructions in Mandarin and SMs in some other languages.

5.1 The modification marker *de* as an SM in Mandarin

In Mandarin, if a modifier is not an adverbial clause, a general modification marker is the enclitic *de*, which follows a modifier and precedes the modified element, as seen in (36). The type of the modifier is labelled on the right side. No counterpart of *de* in modification constructions is seen in languages such as English.

- (38) a. *Yani xijiaomanyan-de chi miantiao. Ta didi ne, langtunhuyan-de.*
 Yani slow.chew-DE eat noodle her brother TOP fast.swallow-DE
 ‘Yani ate the noodles slowly. But her brother ate quickly.’
 b. **Yani pao-de hen lei. Ta didi ne, ye pao-de.*
 Yani run-DE very tired her brother TOP also run-DE

Another argument is that the focus marker *shi* ‘be’ may not occur between *de* and the modified element to its right, again similar to other head elements that take the string to their immediate right as complement. This ban is observed when the pre-*de* element is a modifier, as seen in (39a), but not in other *de*-constructions, as seen in the resultative example in (39b).

- (39) a. **Yani qiaoqiao-de shi likai-le.* (see (36a))
 Yani quietly-DE be leave-PRF
 Intended: ‘Yani indeed left quietly.’
 b. *Yani pao-de shi hen lei.*
 Yani run-DE be very tired
 ‘Yani ran such that she got indeed very tired.’

Since a head element must form a constituent with its complement, *de* and the modified element to its right form a syntactic constituent.

Third, like a correlative adverb, *de* alone does not contribute any substantial semantics to the reading of the whole construction.

Fourth, like a correlative adverb, *de* in a modification construction can be optional under certain conditions, as seen in (36a) above and (40a) below (See Liu, 2016 for more examples). Our informants agree with Liu’s (2016) judgment of this example. In contrast, in (40b), after the verb *jiao* ‘call’, a proper-name occurs. Like many other proper names, *de* is rejected.

- (40) a. *Zhe shi xishi-(de) zaocan.*
 this is Western-style-DE breakfast
 ‘This is a Western-style breakfast. (Liu, 2016: 48)
 b. *Zhe jiao xishi-(*de) zaocan.*
 this call Western-style-DE breakfast
 ‘This is called Western-style breakfast’. (from a reviewer)

We have now identified two kinds of SMs for modification selection in Mandarin. If the modifier is an adverbial clause, a correlative adverb is used; otherwise, *de* is used.

However, *de* is still different from correlative adverbs. One difference is that the consistent form does not show any variation with the semantic relation between the modifier and the modified element. Thus, there does not seem to have any s-selection issue (see the final point of 2.2). Another difference is that *de* is a head element, taking the string to its right as its complement, as we introduced above, but correlative adverbs are not. There are two different relations in the same construction, as shown in (41). In this structure, XP is a modifier and the rest is the modified part.

- (41)
$$\begin{array}{l} \boxed{\quad\quad\quad} \text{modification relation between XP and Y'} \\ \boxed{[_{YP} XP \ [_{Y'} [_{Y^0} de] YP]]} \\ \boxed{\quad\quad\quad} \text{head-complement relation between } de \text{ and YP} \end{array}$$

This is a complementation construction headed by *de*. Recall that a complementation

structure may also express a modification relation (see 3.2). In this structure, like a correlative adverb, *de* is c-commanded by the modifier (i.e., XP in (41)).

In (41), the categorial contrast between different types of the modified element is seen in the written form of *de*. Specifically, when the modified element is nominal, as in (36e, f, g), the written form of *de* is 的, while when the modified element is verbal, as in (36a, b, c, d), the written form of *de* is 地.⁵ For the whole *de*-modification construction, the category of the construction is identical to that of the modified element, as argued by Zhang (2010: 95-105). In (41), XP does not project, according to (8b). Technically, the categorial feature of the post-*de* YP is percolated to *de*. Since *de* can head not only a nominal, as seen in (36e), but also a verbal expression, as seen in (36a), it has no intrinsic categorial features. It is the categorial feature of its complement, YP, that is percolated to the head *de*, and then to the whole complex construction.

Although the structure in (41) is a complementation structure, *de* is not an SM for an argument-taking selection, for at least two reasons. First, neither YP nor the combination of *de* and YP is an argument of XP. Second, neither of these two elements occurs as an argument in any other position, unlike a *that*-clause in English.

One more issue to be clarified is that in Mandarin, *de* is also used in many other constructions, including the cleft *shi ... de* ‘be ... DE’ construction, nominalization construction, noun-complement construction, and various kinds of possessive construction. In this paper, I only discuss the well-recognized modification *de*-constructions, leaving for future research the issue in which of these constructions *de* is an SM, or its syncretism.

We have identified two kinds of SM in modification constructions in Mandarin: the modification marker *de* and a correlative adverb. The former is a head element, whereas the latter is an adverb. Formatives in other domains may also have parallel distributions. For instance, there are D-quantifiers (quantifiers that head a DP; e.g., *every*) and A-quantifiers (quantifiers that appear as adverbs or auxiliaries; e.g., *always*) (see Lewis, 1975; Partee et al., 1987; Partee, 1990).

5.2 Modification markers in other languages

Modification markers are found not only in Mandarin, but also in other languages. If a modification marker is one type of SM, as I argued in 5.1, modification markers in other languages are also SMs.

In Iranian Persian, the particle –EZ (called *Ezafe*) is a modification marker. As pointed out by Larson (2009: 30), “Chinese *de* has (in particular) the essential properties of a ‘reverse *Ezafe*’ particle”. The Persian examples in (42) (Larson, 2009: 34, Larson & Samiian, 2020: (7a, h, i), (10c)) show that in the modification constructions, the modified noun precedes the modifier. This is an order opposite to that in Mandarin, seen in (36). However, like *de*, –EZ must be morphologically hosted by an element to its left, and the modifier can be of various categories, including NP, AP, and PP. The modifier can also be a non-finite relative clause, as seen in (42d). Cinque (2020) argues that relative clauses in Mandarin are all non-finite. Then, we see another similarity between the two languages.

- | | | | |
|---------|-------------------------------|----|---|
| (42) a. | <i>del-e</i> <i>sang</i> (NP) | b. | <i>otâq-e</i> <i>besyâr</i> <i>kucik</i> (AP) |
| | heart-EZ stone | | room-EZ very small |
| | ‘stone heart’ | | ‘very small room’ |

⁵ The distinction in the written forms has been made since the *Temporally Drafted Teaching Grammar of Chinese* (《暫擬漢語教學語法系統》), issued by the Education Bureau of P. R. China in 1956.

- c. *divâr-e jelo Ali* (PP)
 wall-EZ in-front-of Ali
 ‘wall in front of Ali’
- d. *in javân-e [az suis bar=gašt-e]* (non-finite RC)
 this young-EZ from Switzerland re=turn-PPL
 ‘this young man back from Switzerland’

In Tagalog, the morpheme *na*, or its allomorph *-ng*, is also a modification marker. It occurs in the AP modification construction in (43b), the PP modification construction in (43c), and the relative clause construction in (43d), but not in the non-modification construction in (43a) (Rubin, 1994: 116; 2003: 665-666).

- (43) a. *Maganda ang bahay.*
 beautiful TOP house
 ‘The house is beautiful.’
- b. *bahay *(na) maganda*
 house MOD beautiful
 ‘the beautiful house’
- c. *libro *(-ng) nasa mesa*
 book MOD on table
 ‘the book on the table’
- d. *bahay *(na) nakita ko*
 house MOD saw I
 ‘the house that I saw’

In Romanian, the morpheme *de* is also a modification marker. It occurs in the attributive PP construction in (44b), but not in the non-modification construction in (44a). According to Rubin (2003: 665-666), *de* also occurs with relative clauses.

- (44) a. *Covorul acela este sub masă.*
 rug-the that is undertable
 ‘That rug is under the table.’
- b. *Nu-mi place covorul *(de) sub masă.*
 not-to-me pleases rug-the MOD undertable
 ‘I don’t like the rug under the table.’

In addition to these languages, Rubin (1994, 1996, 2002) gives a survey of modification markers in many other languages. Like the modification marker *de* in Mandarin, these modification markers are treated as head elements in Rubin’s works. Our analysis of the *de*-modification construction seems to be applicable to these languages.

In 5.1, I have argued that a modification marker, such as *de*, is an SM in modification selection. Accordingly, various types of modification markers in various languages are also SMs in modification selection. Importantly, one needs to explain why such modification markers do not occur in all languages. Our SM analysis in §2 answers this question.

Depending on the syntactic category of the non-projecting element, different forms of SM can be used. For example, the complementizer *that* is for finite argument clauses, the complementizer *for* is for infinitive argument clauses, but no overt complementizer is seen in small clauses. Similarly, in Mandarin, if a modifier is an adverbial clause, a correlative adverb is used; if a modifier is not an adverbial clause, *de* can be used.⁶

In contrast to the markers for the modification relations introduced above, there is no marker for an argument-taking relation in Mandarin argument clauses, consistently, as seen in (1b). Thus, although we do not deny there are argument-taking selections in Mandarin, we do

⁶ If a PP modifies a verbal phrase, there is no overt meaningless SM in Mandarin, as seen in (i).

(i) *Genju nide jianyi, wo xiugai-le wenzhang.*
 according.to your suggestion I revise-PRF article
 ‘I revised the article according to your suggestions.’

not see any overt marking for the selection relations in the language.

So far, various parameters have been proposed in the typology of languages. Recognizing the two kinds of selection and identifying the markers of the selections enable us to explain more variations and uniformities, across languages.

One shared property between Mandarin and languages such as English and German is that there is no general SM for a nominal argument in the argument-taking selection relation, for subject, direct and indirect object nominals.

In this section, I have shown that the two contrasts reported in §1 are not isolated. The proposed selection marking analysis makes sense in accounting for other contrasts in the relevant languages and beyond.

6. Conclusions

We have explained why a clause contains an extra meaningless element whenever it is an argument of another element in languages such as English and German, but not in Mandarin; and why a clause contains an extra meaningless element whenever it is modified by another clause in Mandarin, but not in languages such as English and German. Adopting Bruening (2010), we have recognized a modification selection, in addition to the familiar argument-taking selection. Both are sisterhood dependencies. The paper has argued that Mandarin does not have a marker for an argument (clause or nominal) because it does not have an argument-taking selection-marking strategy; and languages such as English and German do not have correlative adverbs in adverbial clause constructions because they do not have a modification selection-marking strategy. A correlative adverb and modification markers in other constructions are analysed as SMs. The paper has explained the possible and impossible occurrence of an SM in various major constructions in Mandarin. Recognizing the two kinds of selection and identifying the markers of the selections helps us to explain more variations in languages.

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