

The Ordering of Multiple Relative Clauses Modifying the Same Head NP in Chinese Follows Information-Flow Principles

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This study investigates the ordering restriction of two relative clauses modifying the same head noun phrase in Chinese. We use both retrospective and corpus data to challenge Larson and Takahashi's (2007) account of the ordering of such multiple relative clauses in Chinese in terms of the distinction of individual-level and stage-level relative clauses. Instead, we offer an account based on the discourse function of the multiple relative clauses in Chinese. Specifically, we argue that relative clauses which serve to provide grounding information for the head noun tend to take precedence over other types of relative clauses. The proposed ordering restriction is shown to account for the ordering of multiple relative clauses in both Chinese and English.

Key Words: multiple relative clause, information flow, grounding, Chinese

1. Studies on Multiple Relative Clauses

In their seminal work on the grammar of relative clauses in conversational data, Fox & Thompson (1990) argue that the ordering of English relative clauses is determined by the information flow of the discourse. Specifically they find that non-human head nouns occurring in the subject position of the main clause tend to occur with an object relative clause (RC) in which the head noun is the object in the RC (e.g., *The book which I bought was very interesting.*). They suggest that the object RC can provide anchoring information for the non-human head noun whereas human head nouns prefer to occur with a subject RC in which the head noun is the subject in the RC (e.g., *The student who did not do his homework was my friend.*). The positioning of the head noun in the main clause also plays a role in determining the type of RCs to be used. For example, if a non-human head noun occurs in the object position of the main clause, it tends to occur with a subject RC instead of an object RC, thus precluding the dominance of O-O in which the head noun is the object in the RC as well as in the main clause (e.g., *I love the book which she wrote.*). Fox and Thompson, however, only explore human head nouns in

existential sentences. Whether human head nouns occurring in other sentence patterns behave the same way remains to be investigated.

More relevant to our present study is Fox and Thompson's discussion of utterances containing a sequence of two relative clauses that serve to modify the same head noun. They observe that the two RCs are sequenced in an orderly and predictable fashion in their conversational data. An object RC tends to precede other RCs (1a) when modifying a non-human head noun in the subject position of a main clause¹. However, if the head noun is human, subject RC tends to occur before other RCs (1b). Fox and Thompson (1990) argue that the order of the two relative clauses can be predicted from the principles governing information flow in discourse.

1. a. There was something [which we needed]_{RC1}[which was really obscure]_{RC2}
(Fox and Thompson: 313)
- b. There was a boy [that played the trombone]_{RC1} [that he kind of knew]_{RC2}
(Fox and Thompson: 314)

Chinese and English are both SVO languages, but in Chinese RCs precede their head NP². We may wonder whether information flow principles can also account for ordering of the multiple prenominal RCs in Chinese. According to Larson and Takahashi (2007), the answer is a resounding no. In fact, Larson and Takahashi challenge even Fox and Thompson's observations on English and report that postnominal multiple RCs do not show ordering preference and that multiple RCs can occur in any order. For example, the ordering of multiple RCs in (2a) and (2b) is said to be equally acceptable³.

2. a. The person [who I met]_{RC1} [who smokes]_{RC2}
- b. The person [who smokes]_{RC1}[who I met]_{RC2}

Larson and Takahashi (2007) argue that postnominal RCs differ from prenominal RCs in that the ordering of the former is free from any constraint whereas that of the latter hinges on whether they express stage-level versus individual level properties. Their study shows that stage-level RCs take precedence over individual RCs (3a) and that placement of individual-level RCs before stage-level RCs renders sentences (3b) unacceptable.

¹ As for a non-human head occurring in the object position of the main clause, it is expected that the first RC should be a subject RC. However, their data do not produce such an example.

² Among its other functions in Chinese, the word *de*, which we have notated as *de*, serves as a RC marker.

³ It is well-established that English restrictive RCs occur before non-restrictive ones and reduced ones such as modifying infinitivals.

3. a. [wo zuotian kanjian]_{RC1} de [hui shuo yidaliyu]_{RC2} de ren shi Lisi⁴.
 I yesterday see de can speak Italian de person is Lisi
 ‘The person whom I saw yesterday who can speak Italian is Lisi.’ (Good)
- b. [hui shuo yidaliyu]_{RC1} de [wo zuotian kanjian]_{RC2} de ren shi Lisi.
 can speak Italian de I yesterday see de person is Lisi
 ‘The person whom I saw yesterday who can speak Italian is Lisi.’ (Bad)

However, there is no ordering restriction if all the RCs exhibit the same property. For example, RCs expressing stage-level properties order freely among themselves.

4. a. [Cong Yidali huilai]_{RC1} de [wo zuotian kanjian]_{RC2} de ren shi Lisi.
 From Italy return de I yesterday see de person is Lisi
 ‘The person who returned from Italy whom I saw yesterday is Lisi.’ (Good)
- b. [Wo zuotian kanjian]_{RC2} de [cong Yidali huilai]_{RC1} de ren shi Lisi.
 I yesterday see de from Italy return de person is Lisi
 ‘The person whom I saw yesterday who returned from Italy is Lisi.’ (Good)

Similarly, RCs exhibiting individual-properties need not observe any ordering restriction either, as in (5a) and (5b).

5. a. [Hui shuo yidaliyu]_{RC1} de [xihuan qu yinyuehui]_{RC2} de ren shi Lisi.
 can speak Italian de like go concert de person is Lisi
 ‘The person who can speak Italian who likes to go to concert is Lisi.’ (Good)
- b. [Xihuan qu yinyuehui]_{RC2} de [hui shuo yidaliyu]_{RC1} de ren shi Lisi.
 like go concert de can speak Italian de person is Lisi
 ‘The person who can speak Italian who likes to go to concert is Lisi.’ (Good)

According to Larson and Takahashi (2007), the ordering of multiple postnominal RCs (i.e., stage-level RCs before individual-level RCs) follows a similar pattern with the ordering of multiple prenominal modifiers in English. If there is more than one prenominal adjective, the outside one tends to encode individual, permanent, and characteristic properties whereas the inside adjective tends to encode stage-level, episodic, transient properties (6a). The reversal of the order of the stage-level adjectival modifier and individual-level adjectival modifier generates such awkward expressions as (6b).

6. a. The nonvisible visible stars include Capella. (Coherent!)
- b. The visible nonvisible stars include Capella. (Odd!)

⁴ Following is a list of the abbreviations used in this paper following the convention in Li and Thompson (1981): BEI: passive marker; CL: classifier; PFV: perfective aspect.

Multiple prenominal RCs in Chinese behave similarly to multiple prenominal adjectives in English, according to Larson and Takahashi (2007), because both prenominal RCs in Chinese and prenominal adjectives in English do not have full clausal status because of “the reduced/participial status of prenominal relatives”⁵. On their account, individual-level prenominal RCs are closer to an NP for generic force quantification.

Now here is the issue. Whereas Fox and Thompson (1990) find that the ordering of multiple postnominal RCs is subject to the information flow principles in discourse, Larson and Takahashi (2007) believe that multiple postnominal RCs show no ordering preference, but multiple prenominal RCs are sequenced in terms of whether they exhibit stage-level or individual-level properties. This issue is addressed in the present study. In the next section, we show that the analysis by Larson and Takahashi (2007) is problematic and that a different analysis is needed to account for the ordering of Chinese multiple prenominal RCs.

2. The Ordering of Stage-Level RCs and Individual-level RCs

Larson and Takahashi (2007) propose that stage-level RCs always occur before individual-level RCs for generic force quantification and that multiple RCs expressing same properties do not obey any ordering restriction. However, counterexamples to their claim are abundant. The following examples in Chinese show that stage-level RCs can occur after individual-level RCs.

7. a. [Wo renshi]_{RC1}de [xie le yi-ben shu]_{RC2} de na-ge xuesheng hen congming.
I know de write PFV one-CL book de that-CL student very smart
‘The student whom I know who wrote a book is very smart.’ (Good)
- b. [Xie le yi-ben shu]_{RC1} de [wo renshi]_{RC2}de na-ge xuesheng hen congming.
write PFV one CL book de I know de that CL student very smart
‘The student who wrote a book whom I know is very smart.’ (Odd)

The first RC in (7a) expresses individual-level properties since knowing somebody is a stable knowledge. And the second RC in (7a) encodes stage-level properties because the completion of three books is a one-time event happening in the past. Contrary to the claim that stage-level RCs must precede individual-level RCs, the contrast in (7) shows that the opposite is true because the placement of the individual-level RC before the stage-level RC generates an awkward, if not ungrammatical, sentence in (7b).

⁵ It should be noted that Larson and Takahashi’s (2007) suggestion that a full-fledged Chinese RC should be treated as a participle or a reduced clause is questionable. Actually, the other way is said to be true. According to Sproat & Shih (1988, 1991) and Duanmu (1998), adjectives in A-de-N structures should be analyzed as full-fledged RCs in Chinese.

Secondly, the ordering of RCs expressing the same properties is not always random. Although Larson and Takahashi (2007) correctly report that both sentences (5a) and (5b) are equally acceptable, it is not difficult to find examples that exhibit ordering preference among the multiple RCs with the same properties. The following contrast shows that the word order in (8a) is favored over the one in (8b).

8. a. [Wo renshi]_{RC1} de [xihuan changge]_{RC2} de na ge xuesheng hen youhao.
 I know de like sing de that CL student very friendly
 ‘The student whom I know who likes to sing is very friendly.’ (Good)
- b. [Xihuan changge]_{RC2} de [wo renshi]_{RC1} de na ge xuesheng hen youhao.
 like sing de I know de that CL student very friendly
 ‘The student who likes to sing whom I know is very friendly.’ (Odd)

Although the two RCs in both (8a) and (8b) express the same properties, (e.g., individual-level properties), contrary to Larson and Takahashi’s account, their ordering is not random at all. The word order in (8a) generates a grammatically sound sentence whereas (8b) sounds pretty odd. Of course, there is no denying that sometimes RCs expressing individual-properties can be ordered freely as shown in (5a) and (5b). The same observation also extends to multiple RCs which encode stage-level properties.

9. a. [Wo zuazhu]_{RC1} de [ni fangzou]_{RC2} de na tiao yu hen da.
 I catch de you release de that CL fish very big
 ‘The fish which I caught which you released is very big.’ (Good)
- b. [Ni fangzou]_{RC1} de [wo zuazhu]_{RC2} de na tiao yu hen da.
 you release de I catch de that CL fish very big
 ‘The fish which you released which I caught is very big.’ (Good)

The two RCs in (9) exhibit stage-level properties since both of them describe a transient action happening in a certain past and their ordering is free. However, sometimes RCs expressing stage-level properties do manifest an ordering preference.

10. a. [Wo zuotian kanjian]_{RC1} de [bei daibu]_{RC2} de na ge xuesheng hen shuai
 I yesterday see de BEI arrest de that CL student very handsome
 ‘The student whom I saw who was arrested is very handsome.’ (Good)
- b. [Bei daibu]_{RC2} de [wo zuotian kanjian]_{RC1} de na ge xuesheng hen shuai
 BEI arrest de I yesterday see de that CL student very handsome
 ‘The student who was arrested whom I saw is very handsome.’ (Odd)

Examples such as those from (7) to (10) challenge Larson and Takahashi’s (2007) argument that the ordering of Chinese multiple RCs is related to the distinction of stage-level RCs and individual RCs.

Another place to examine the validity of Larson and Takahashi's (2007) argument is the ordering of prenominal adjectives in Chinese. It is a well-known fact that an adjective can be used to modify a noun with (11a) or without *de* (11b).

11. a. yi ge piaoliang de xuesheng
 one CL beautiful de student
 'a beautiful student'
 b. yi ge piaoliang xuesheng
 one CL beautiful student
 'a beautiful student'

It has been argued (Sproat & Shih 1988, 1991; Duanmu 1998) that 'A-de-N' structure should be analyzed as a RC⁶ since the same *de* is used in Chinese RCs whereas the *de*-less structure 'A-N' should be treated as a word. If the assumption that the *de*-modification 'A-de-N' should be treated as a RC is correct, the theory by Larson and Takahashi (2007) would predict that the stage-level adjectives takes precedence over the individual-level adjectives. Examples that do not follow this stringent pattern of ordering would cast serious doubt on their theory. Consider the examples in (12).

12. a. Gaogao de lüe xian pijuan de na ge xuesheng
 tallish de little appear tired de that CL student
 'The tall student who appeared a little bit tired' (Good)
 b. Lüe xian pijuan de gaogao de na ge xuesheng
 little appear tired de tallish de that CL student
 'The student who appeared a little bit tired who is pretty tall' (Good)

The examples in (12) indicate that shuffling the two modifying adjectives around does not affect the acceptability of the expression. They pose a challenge to the analysis of Larson and Takahashi. Actually, adjectives can be placed in any order with the help of *de* as shown in the following examples.

13. a. nenggan de congming de qinfen de xuesheng
 competent de smart de diligent de student
 'competent, smart, and diligent student' (Good)
 b. congming de nenggan de qinfen de xuesheng
 smart de competent de diligent de student
 'smart, competent, and diligent student' (Good)
 c. qinfen de congming de nenggan de xuesheng
 diligent de smart de competent de student

⁶See Paul (2005) for counterarguments.

‘diligent, smart, competent and student’ (Good)

14. a. feichang shengqi de hen pijuan de jichanglulu de xuesheng
 very angry de very tired de very-hungry de student
 ‘Very angry, tired, and hungry student’ (Good)
- b. hen pijuan de feichang shengqi de jichanglulu de xuesheng
 very tired de very angry de hungry de student
 ‘Very tired, angry, and hungry student’ (Good)
- c. jichanglulu de hen pijuan de feichang shengqi de xuesheng
 hungry de very tired de very angry de student
 ‘Very hungry, tired, and angry student’ (Good)

All the adjectives in (13) are individual-level ones while adjectives in (14) showcase stage-level adjectives. The reordering of them in any sequence does not diminish the acceptability of the expression at all.

Thus, the distinction between stage-level RCs and individual RCs cannot account for the ordering of Chinese multiple RCs, nor can it explain the ordering of multiple English RCs. In the next section, we will present our account of the ordering restriction on Chinese multiple RCs.

3. Grounding RCs Versus Non-grounding RCs

According to Lapolla (1995), when a referent is introduced into a discourse, its information status is either identifiable or unidentifiable. An unidentifiable referent can be in one of the following three activation statuses.

1) Active

The referent is in the current focus of consciousness

2) Accessible

The referent is not in the current focus of consciousness, but its identity can be derived from previous text, from situation, or through logics.

3) Inactive

The referent is currently not in the focus of consciousness of periphery of consciousness, but in the long term memory.

Identifiable referents are either brought back into the text after previous mention in the discourse or textually, situationally, inferentially derivable. Unidentifiable referents are introduced into the discourse for the first time and its identity cannot be established through a link with the previous text, situation or logical inference.

In effective communication, referents are supposed to be brought into the discourse in a way to make it relevant to the listener or speaker. Referents whose relevance is not established from its previous mention or situation must be grounded to justify their existence. According to Fox and Thompson (1990), a referent can be

grounded either by a main clause as in the English examples (15a-b) or by a RC as in Chinese examples 16(a-b).

15. a. He's got a spring-[that comes, way up]_{RC} (Fox and Thompson 1990: 301)
 b. There were two people there [who were constantly on stage]_{RC}

Sentence (15) instantiates main clause grounding. The unidentifiable referent *a spring* is grounded through the link with an identifiable referent *he*. A referent can also be grounded by a locative in the main clause. For example, the referent *two people* in (15b) is grounded by the locative *there*. In the same token, a referent can also be grounded by associating with an identifiable referent (16a) or locative (16b) in its modifying relative clause⁷.

16. a. [wo zuotian mai]_{RC} de na ben shu bei tou le
 I yesterday buy de that CL book BEI steal PFV
 'The book which I bought yesterday was stolen.'
 b. [fang zai zuozi shang]_{RC} de na ben shu bei tou le
 put at table on de that CL book BEI steal PFV
 'The book which was put on the table was stolen.'

The referent *na ben shu* 'that book' in (16a) is grounded by connecting it with an identifiable discourse entity *wo* 'I' and the referent in (16b) is grounded by the locative *zai zuozis hang* 'on the table'. Van Valin (1975) argues that the unmarked information status of locatives is accessible and that is the reason why they can serve to ground a referent. However, this does not mean any locative can be used to ground a referent. Generic locatives such as *anywhere, everywhere, the whole world*, and so on cannot be used to ground a referent since they are too broad to single out and identify a referent in the spatial world.

Besides grounding a referent, a RC can also serve to provide an assertion of a referent. In that case, the RC is used to characterize or describe a referent (Fox and Thompson 1990: 301).

17. a. The man [who I have for linguistics]_{RC} is really too much.
 b. There is a woman in my class [who is a nurse]_{RC}

Other than grounding, the RC in (17a) serves to ground the referent *the man* through the link with the accessible referent *wo* 'I'. The RC in (17b), on the other hand, does not supply any accessible referent or locative to ground the unaccessible referent *a woman*. Instead, it provides characterizing information revealing her profession.

⁷Grounding by a RC is called *anchoring* in Prince (1981).

For the purpose of this study, we only identify two groups of RCs: grounding RCs and non-grounding RCs. The former serves to provide an accessible referent or a locative expression to ground its head NP while the latter provides neither of them. The distinction of grounding RCs and non-grounding RCs allows us to make the following proposals regarding the ordering of Chinese multiple RCs:

18. a. Grounding RCs tend to take precedence over non-grounding RCs.
- b. If all the prenominal RCs are either grounding RCs or non-grounding RCs, they may order freely among themselves when modifying the same head NP.

With the two proposals in order, we now proceed to examine the data in Larson and Takahashi (2007) and the counterexamples mentioned in Section 2. Section 2 shows that the claim that stage-level RCs always precede individual-RCs is untenable. The relevant examples are repeated below.

19. a. [Wo renshi]_{RC1}de [xie le yi ben shu]_{RC2} de na ge xuesheng hen congming.
 I know de write PFV one CL book de that CL student very smart
 ‘The student whom I know who wrote a book is very smart.’ (Good)
- b. [Xie le yi ben shu]_{RC1} de [wo renshi]_{RC2} de na ge xuesheng hen congming.
 write PFV one CL book de I know de that CL student very smart
 ‘The student who wrote a book whom I know is very smart.’ (Odd)

The two RCs in (18) fulfill different discourse functions. The RC *worenshi* ‘I know’ helps to ground the head NP *na ge xuesheng* ‘that student’ by linking the head NP to an accessible referent *wo* ‘I’. By contrast, the RC *xie le yiben shu* ‘wrote a book’ does not provide any accessible referent to ground the head NP, but provides additional information regarding the achievement of the referent denoted by the head NP. According to our proposal in (18a), the grounding RC *wo renshi* ‘I know’ should precede a non-grounding RC *xie le yi-ben shu* ‘wrote a book’. In order to test the validity of proposal (18a), let’s examine the following sentences in Larson and Takahashi (2007).

20. a. [Wo zuotian kanjian]_{RC1} de [hui shuo yidaliyu]_{RC2} de ren shi Lisi.
 I yesterday see de can speak Italian de person is Lisi
 ‘The person whom I saw yesterday who can speak Italian is Lisi.’ (Good)
- b. [Hui shuo yidaliyu]_{RC1} de [wo zuotian kanjian]_{RC2} de ren shi Lisi.
 can speak Italian de I yesterday see de person is Lisi (Bad)
 ‘The person whom I saw yesterday who can speak Italian is Lisi.’

We agree with their judgment that (20a) is acceptable whereas (20b) is not. According to our proposal (18a), the contrast in (20) is expected. The first RC in (20a) is a grounding

RC which contains an accessible referent *wo* ‘I’ to ground the referent *ren* ‘person’. Thus, proposal (18a) correctly predicts that the grounding RC *wo zuotian kanjian* ‘(whom) I saw yesterday’ should be placed before the non-grounding RC *hui shuo yidaluyu* ‘(who) can speak Italian’.

After showing how proposal (18a) is superior to the analysis by Larson and Takahashi, we now turn to examine the validity of proposal (18b).

21. a. Na ge [meiyou lai]_{RC1} de [hen xihuan shang ke]_{RC2} de xuesheng shi Lisi.
 that CL not come de very like attend class de student is Lisi
 ‘The student who did not come who loves school is Lisi.’ (Good)
- b. Na ge [hen xihuan shang ke]_{RC2} de [meiyou lai]_{RC1} de xuesheng shi Lisi
 that CL very like attend class de not come de student is Lisi
 ‘The student who loves school who did not come is Zhagsan.’ (Good)

The RC *meiyou lai de* ‘(who) did not come’ is a stage-level RC whereas the RC *hen xihuan shang ke* ‘(who) loves school’ is an individual-level RC. Larson and Takahashi (2007) wrongly predict that the word order in (21a) is the only acceptable one. However, the 16 native speakers we have consulted all agreed that (21a) and (21b) are equally acceptable. Our proposal can easily account for the grammaticality of the sentences in (21). The stage-level RC *meiyou lai* ‘(who did not come)’ contains no grounding expression and the same is true with the individual-level RC *hen xihuan shangke* ‘(who) loves school’. Thus, proposal (18b) correctly predicts that the two non-grounding RCs show no ordering preference. Proposal (18b) can also easily explain the contrast in (22) in which the ordering of two stage-level RC cannot be shuffled.

22. a. [Wo zuotian kanjian]_{RC1} de [bei daibu]_{RC2} de na ge xuesheng hen piaoliang.
 I yesterday see de BEI arrest de that CL student very pretty
 ‘The student whom I saw yesterday who was arrested is very pretty.’ (Good)
- b. [Bei daibu]_{RC2} de [wo zuotian kanjian]_{RC1} de na ge xuesheng hen piaoliang.
 BEI arrest de I yesterday see de that CL student very pretty
 ‘The student who was arrested whom I saw yesterday is very pretty.’ (Odd)

Both RCs in (22) express stage-level properties which are predicted to order freely in Larson and Takahashi (2007). The unacceptability of the word order in (22b) again shows their analysis has to be refined to accommodate the contrast in (22). Our proposal (18b), in contrast, correctly predicts that the only acceptable order is (22a) because only the RC *wo zuotian kanjian* ‘(whom I saw yesterday)’ is a grounding RC because it contains a grounding accessible referent *wo* ‘I’. The other RC *bei daibu* ‘(who) was arrested’ should follow the grounding RC because it does not have any grounding information in it. After examining the ordering of two stage-level RCs in (22), we

proceed to discuss the ordering of two individual-level RCs in Larson and Takahashi (2007) to examine the validity of our proposals.

23. a. [Hui shuo yidaliyu]_{RC1} de [xihuan qu yinyuehui]_{RC2} de ren shi Lisi.
 can speak Italian de like go concert de person is Lisi
 ‘The person who can speak Italian who likes to go to concert is Lisi.’ (Good)
- b. [Xihuan qu yinyuehui]_{RC2} de [hui shuo yidaliyu]_{RC1} de ren shi Lisi.
 like go concert de can speak Italian de person is Lisi
 ‘The person who can speak Italian who likes to go to concert is Lisi.’ (Good)

Both RCs (23) are individual-level RCs because the RC *hui shuo yidaliyu* ‘(who) can speak Italian’ describes the ability of a person and the RC *xihuan qu yinyuehui* reveals a habitual activity of that person. Larson and Takahashi (2007) correctly predict their ordering is not subject to any constraint. Our proposal can also account for the ordering of the two RCs in (23). Examination of the two RCs in (23) shows that neither of them contains grounding element in them. In other words, both of them are non-grounding RCs and that is the reason why they do not show any ordering preference.

Lastly we show the ordering of adj-de-N structures. According to Sproat & Shih (1988, 1991) and Duanmu (1998), A-de-N structures should be analyzed as RCs. Interestingly, the ordering of the adjectives in the A-de-N structure is not subject to any restriction regardless whether they are individual-level adjectives or stage-level adjectives.

24. a. meili de congming de na ge xuesheng
 beautiful de smart de that CL student
 ‘that beautiful and smart student’
- b. congming de meili de na ge xuesheng
 smart de beautiful de that CL student
 ‘that smart and beautiful student’
25. a. pibei de jichanglulu de na ge xuesheng
 tired de hungry de that CL student
 ‘that tired and hungry student’
- b. jichanglulu de pibei de na ge xuesheng
 hungry de tired de that CL student
 ‘that hungry and tired student’
26. a. meili de jichanglulu de na ge xuesheng
 beautiful de hungry de that CL student
 ‘that beautiful and hungry student’
- b. jichanglulu de meili de na ge xuesheng
 hungry de beautiful de that CL student
 ‘that hungry and beautiful student’

The adjectives in (24) and (25) are individual-level adjectives and stage-level adjectives respectively whereas the two adjectives in (26) exhibit different properties. One adjective *meili* ‘beautiful’ is an individual-level adjective and the other one *jichanglulu* ‘hungry’ is a stage-level adjective. The acceptability of all the expressions from (24) to (26) indicates that adjectives in *de*-modification structures show no ordering preference. Obviously the theory by Larson and Takahashi (2007) cannot accommodate the ordering of the adjectives from (24) to (26). In contrast, our proposals can easily explain the ordering patterns of the adjectives. If the assumption that adjectives in *de*-modification structures should be analyzed as RCs is correct, our proposals correctly predict that the ordering of adjectives in *de*-modification structures is random since none of the adjectives contain any grounding element. As non-grounding RCs, the ordering of adjectives in the *de*-modification structures is predicted to be random.

To summarize, our proposals can not only explain the data in the study by Larson and Takahashi (2007), but also accommodate the data which challenges it. To further test the reliability of our proposals, in the next section we examine the ordering of multiple Chinese RCs in a large corpus, the Lancaster Corpus of Mandarin Chinese (LCMC).

4. Multiple RCs in LCMC

While the proposals in (18) can account for the full range of examples in both English and Chinese, one may complain about the reliance on purely linguistic intuitions and judgment. Anyway, different native speakers might have slightly different intuitions regarding the acceptability of a certain linguistic expression and it is not unusual to find that the same sentence might be judged as perfect by some native speakers and be frowned upon by others. So in this section, we will confront the proposals in (18) to the corpus data and if necessary go back to step one for possible refinement of the proposals regarding the ordering of multiple RCs.

The Chinese multiple RCs for analysis in this section are selected from a publicly available Chinese language corpus, the Lancaster Corpus of Modern Chinese (LCMC) (McEnery et al. 2003). LCMC is a one-million-word balanced corpus of written Mandarin Chinese, which consists of five hundred 2,000-word samples of written Chinese texts selected from fifteen text categories published in Mainland China around 1991. It provides a web-based concordance search functionality, which greatly facilitates this research. The concordance results from LCMC always come with a complete sentence where the searched word occurs. Careful examination of LCMC generates 31 relevant examples which are detailed in the following table, where the two or more RCs modifying the same head NPs are coded along the grounding/non-grounding and individual/stage-level dimensions.

The inspection of the ordering of multiple RCs shows that a total of 27 tokens observe the ordering pattern of grounding RC-non-grounding RC and only 4 tokens

follows the order of non-grounding RC-non-grounding RC. The ordering patterns thus fit nicely into our proposals in section 3.

Table 1: The ordering of Multiple RCs in LCMC

#	RC1	RC2	RC3	#	RC1	RC2
1	NGRC/STRC	NGRC/SRC		2	GRC/STRC	NGRC/IRC
3	GRC/STRC	NGRC/IRC		4	GRC/IRC	NGRC/IRC
5	GRC/STRC	NGRC/STRC		6	GRC/STRC	NGRC/STRC
7	GRC/STRC	NGRC/STRC		8	GRC/STRC	NGRC/STRC
9	GRC/STRC	NGRC/STRC		10	GRC/STRC	NGRC/IRC
11	GRC/STRC	NGRC/IRC		12	GRC/STRC	NGRC/IRC
13	GRC/STRC	GRC/STRC		14	GRC/STRC	NGRC/IRC
15	GRC/STRC	NGRC/STRC		16	GRC/STRC	GRC/STRC
17	GRC/STRC	NGRC/IRC	NGRC/IRC	18	GRC/STRC	NGRC/IRC
19	GRC/STRC	NGRC/IRC		20	GRC/STRC	NGRC/IRC
21	GRC/STRC	NGRC/IRC		22	NGRC/IRC	NGRC/IRC
23	GRC/IRC	NGRC/IRC		24	GRC/STRC	NGRC/STRC
25	GRC/STRC	NGRC/STRC		26	NGRC/IRC	NGRC/IRC
27	GRC/STRC	NGRC/IRC		28	GRC/STRC	NGRC/IRC
29	NGRC/IRC	NGRC/IRC		30	GRC/STRC	NGRC/IRC
31	GRC/IRC	NGRC/IRC				

STRC= Stage-level Relative Clause; IRC= Individual-level Relative Clause; NGRC=Non-grounding Relative Clause; GRC=Grounding Relative Clause

It should be noted that the ordering patterns observed in the above table also seem to be consistent with the Larson and Takahashi's (2007) account, as stage-level RCs always precede individual-level RCs. However, their account falls short on explaining the

examples involving two RCs of the same property (i.e., when they are both individual-level RCs or both stage-level RCs). According to Larson and Takahashi (2007), multiple pronominal RCs exhibiting the same properties order freely among them. That is, multiple pronominal stage-level RCs can be ordered in random sequence and the same is said to be true for multiple pronominal individual-level RCs. A careful inspection of the data shows that a grounding stage-level RC always take precedence before a non-grounding RC (e.g., #5, #6, #7, #8, #9, #13, #15, #16, #24, #25) and the same observation extends to multiple pronominal individual-level RCs (see #4, #23, #31). We provide one relevant example each from the LCMC to illustrate the ordering of stage-level RCs (27a) and that of individual-level RCs (27b) below. The first RCs in these two examples are both grounding RCs, because they provide the grounding referent *wo* ‘I’ in (27a) and a locative *zai qiangjiao* ‘at the corner’ in (27b), respectively. According to our proposal (18a), they occur before the second RCs which do not contain a grounding element.

27. a. [wo zai meiguo xie]_{RC1} de [gang chuban]_{RC2} de gongcheng kongzhi lun
 I in US write de just publish de engineer control theory
 ‘*Theory on Engineering Control*’ which I wrote in US which was just published’
 (LCMC A)
- b. [fang zai qiang jiao]_{RC1} de na ba [yong gaoliang gan kunza]_{RC2} de saozhou
 put at wall corner de that CL use sorghum stem tie de broom
 ‘The broom which is in the corner of the wall which is made of sorghum stem’
 (LCMC K)

Furthermore, if pronominal stage-level RCs could be freely ordered as Larson and Takahashi (2007) suggest, we would expect that some non-grounding stage-level RCs can occur before grounding stage-level RCs. However, not a single instance where a non-grounding stage-level RC occurs before a grounding stage-level RC can be found. The same observation also applies to the ordering of multiple pronominal individual-level RCs as shown in #4, #23, #31. In conclusion, our proposal provides a better account for the ordering of multiple pronominal RCs irrespective of whether they are stage-level RCs or individual-level RCs.

Our proposal can not only better predict the ordering of Chinese multiple RCs, but also can be extended to explain the ordering of English multiple RCs. As opposed to Larson and Takahashi (2007) who claim that there is no ordering restriction for multiple RCs, Fox and Thompson (1990) believe that the ordering of English multiple RCs follows a predictable fashion. Let’s examine all the multiple RCs in Fox and Thompson (1990) to test whether our analysis can be extended to English data.

28. a. And there was one thing [they said in article] [that was really intriguing]
 b. There was something [we needed] [which was really obscure]
 c. He claims that there’s kind of stuff [you make] [that has a pear in it]

- d. Well, this little, this other little atomic clock [that I have] [that used to be in the bathroom]
- e. Cause the one [I got in my office][I got for three]

An examination of the data in (28) shows that the first RC contains an accessible referent in the subject position of the RC to ground the head NP and that its ordering nicely conforms to our proposal (18a) that grounding RC precedes non-grounding RCs⁸.

Finally, our proposals in (18) can be extended to the well-established observation that restrictive RCs always precede non-restrictive ones in English (Larson and Takahashi 2007). A restrictive RC in English is to identify and single out the referent denoted by the head NP. In other words, a restrictive RC serves to ground the referent of the head NP. On the contrary, a non-restrictive in English helps to describe the head NP without providing any grounding information. Therefore, our proposal correctly predicts that a restrictive RC which fulfills the function of a grounding RC should be placed before a nonrestrictive RC which provides additional information of the head NP. It's not clear how the account by Larson and Takahashi (2007) could handle this pattern of ordering among restrictive and nonrestrictive RCs.

4. Concluding remarks

In this paper we show that grounding RCs always precede non-grounding RCs in Chinese as well as in English. In addition, we show that distinguishing grounding

⁸ All the head NP in (28) are non-human. As for human head nouns, Fox and Thompson (1990) believe that the ordering of multiple RCs is different. For example, the first RC in the following sentence does not have a grounding referent.

There was a boy [that played the trombone]_{RC1} [that he kind of knew]_{RC2}

It seems that the ordering of the two RCs here constitutes a counterexample to our proposal. Fox and Thompson (1990), however, argue that human heads are grounded differently from non-human heads. Non-human heads are typically grounded by humans who own them, use them, and manipulate them and the grounding humans are typically given. On the contrary, human heads are grounded by “their own activities, that is, to early predicates” (Fox and Thompson: 309). In other words, the first RC in the above sentence can serve as a grounding RC although it does not contain any grounding given referent. However, the Chinese data shows that human heads behave like nonhuman heads in the sense that RCs containing a grounding referent always occur before RCs which lack a grounding referent. Whether Chinese differs from English in terms of the animacy of the heads merits further research.

modifiers from non-ground modifiers allows us to offer an elegant explanation of the ordering of the adjectives in *de*-modification structures, e.g., A-*de*-N in Chinese. The question then arises as to why multiple RCs are ordered that way. Our tentative answer to that is that this ordering pattern pertains to the information flow in the discourse. Since given information tends to be deployed before new information (Clark & Clark, 1978; Ming & Chen, 2010), it is reasonable to assume that a linguistic unit containing a given referent should occur before a linguistic unit which lacks any given information. By analogy, a grounding RC should be placed before a non-grounding RC because the former contains a given referent but the latter lacks any given information, that is, any given referent. Future research is needed to test the validity of the above assumption.

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