Relativization in Mandarin Chinese

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Abstract

This thesis illustrates relative constructions with a particular focus on Cinque (2020)'s unified *double-Headed* structure. Mandarin Chinese has been selected as the main research object due to its specialties in relativization. I propose that the application of *double-Headed* structure needs to be combined with the *multi-dominance* theory, which helps to specify the composition of two Heads (internal and external) in relativization. The research explores both appositive relative clauses and resumptive pronouns, contributing to a comprehensive understanding of relative constructions and supporting the deasibility of a unified structure for relativization.

I argue against the idea that Mandarin Chinese relative clauses are actually a kind of non-finite/participial relative form where no appositive relatives are available. With this in mind, I confirm that the only relative element *de* in Mandarin Chinese is a special complementizer, which makes the pre-nominal structure plausible in relativization. Moreover, I specify the classification of integrated appositives by distinguishing between semi-integrated and fully-integrated types. Based on structural and distributional diagonstics, I propose that Mandarin Chinese appositive relatives belong to the fully-integrated category, setting them apart from other appositive constructions.

Furthermore, the properties of resumptive pronouns shown in Mandarin Chinese and other languages trigger further considerations for classifying resumptive pronouns. Through the combination of *double-Headed* structure and *multi-dominance* theory, I characterize Mandarin resumptive pronouns as 'weak', due to their absence of overt morphological features such as case or gender.

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Statement of Originality

I, Sun Jiatian, confirm that this work is the result of my own efforts. Any ideas, data, images, or text resulting from the work of others (whether published or unpublished) are fully identified as such within the work and attributed to their originator in the text, bibliography, or footnotes.

I confirm this thesis has not been previously accepted for any degree award and is not being concurrently submitted as a candidature for any degree except the Doctor of Philosophy of the University of York.

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Chapter 1

Introduction

In this thesis, I will try to examine relative constructions by combing Cinque (2020)'s *double-Headed* structure and the *multi-dominance* theory.

(1)

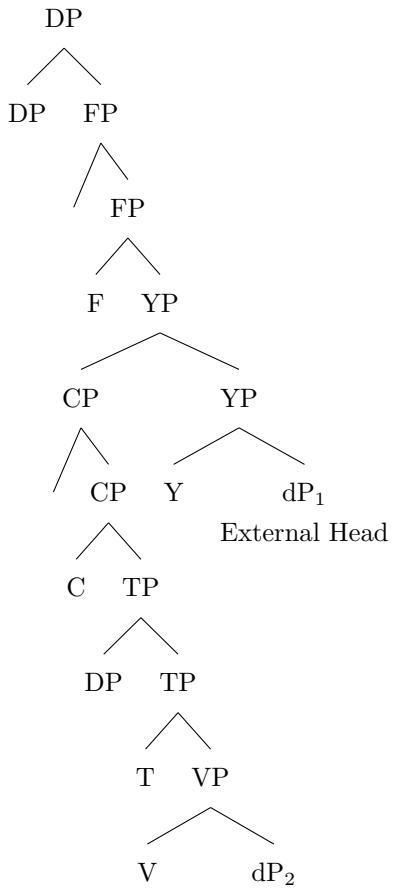


Figure 1:The double-Headed structure

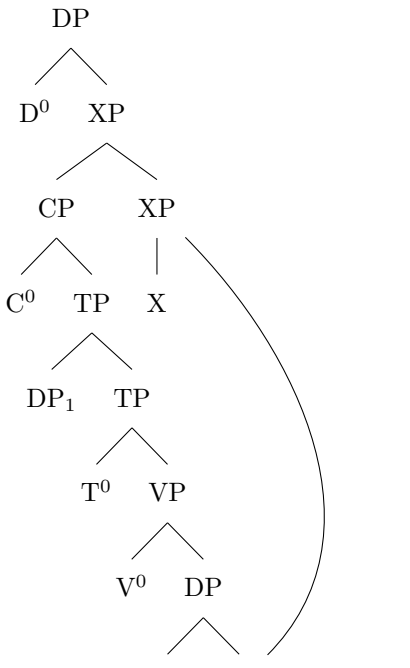


Figure 2:The multi-dominance theory

(2)

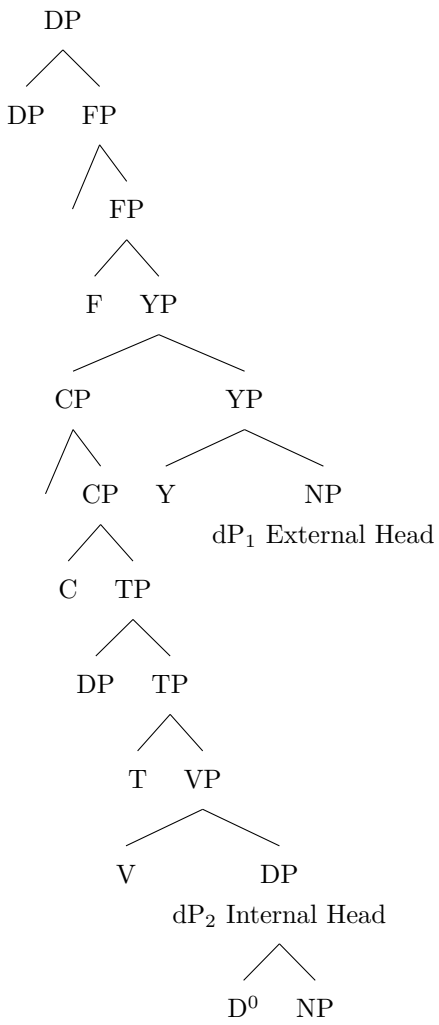


Figure 1 and Figure 2 shown in (1) are the applications of *double-headed* and *multi-dominace* in relativization. Relative constructions have been extensively studied in the literature, with most analyses focusing on the relationship between the head noun and the abstract gap within the relative clause. Cinque (2020) makes the hypothesis that all relative clauses can be derived from single, double-headed, universal structures via different, independently motivated syntactic operations. Within this framework, two primary derivational paths are distinguished:
(a) Raising: where the internal and external head nouns are the same, and the internal head raises to Spec,CP, resulting in the full deletion of the external head;
(b) Matching: in one case, the two head nouns are again the same, and the external head deletes the internal one fully; in another case, the internal head is larger than the external one and therefore cannot be fully deleted.

The more recent *multi-dominance* approach offers a novel perspective on the derivation of relative clauses. It characterizes relativization as a Parallel Merge process, allowing the relativized NP to occupy two distinct positions simultaneously (see Figure 2 in (1)).

Both the *double-headed* and *multi-dominance* approaches recognize that the head noun

functions in two distinct syntactic positions. However, they differ in the syntactic size of the head noun in these two positions: the *double-headed* structure treats both the internal and external heads as dPs (i.e., extended projections containing D and NP), whereas the *multi-dominance* analysis posits a bare noun merged at two positions. By situating the *double-headed* structure within the framework of *multi-dominance* (as shown in (2)), the internal head (dP_2) emerges as a 'big DP' comprising both D^0 and NP, while the external head (dP_1) corresponds to a simple NP-identical to the NP in dP_2. Within this combined analysis, the presence and type of D^0 in dP_2 plays a key role in determining the extent of deletion, explaining the size distinctions observed between the internal and external heads. This combined approach not only captures the structural distinctions inherent in relativization but also offers a principled account for the distribution and nature of resumptive pronouns. Specifically, resumptive pronouns can be regarded as a product of partial matching between two head nouns, with D^0 playing a crucial role in their licensing.

The thesis contains four parts and is organized as follows:

In Chapter 2, I illustrate the basic properties of relative constructions and examine the existing approaches to analyzing relative clauses: the Head External Analysis (Standard Analysis), the Head Raising Analysis (Promotion Analysis), and the Matching Analysis. Cinque's *double-Headed* structure and the *multi-dominance* structure have also been introduced to reflect their advantages of unifying the derivation of relative clauses. Furthermore, the combination of the *double-Headed* structure and the *multi-dominance* approach has been illustrated to clarify the structural composition of head nouns.

In Chapter 3, I analyze the properties of Mandarin Chinese relative clauses. In the literature, Ning (1993)'s operator movement approach, Simpson (2002)'s head raising approach, Y. Xu (2009)'s matching approach and Aoun and Li (2003)'s mixed approach have been applied to analyze the derivation of Mandarin Chinese relative clauses. I adopt Cinque's *double-Headed* structure but argue against his claim that Mandarin Chinese relative clauses are just the non-finite/participial ones.

In Chapter 4, I examine the analyses of appositive relative clauses. Smith (1964)'s D-Complement Hypothesis, Jackendoff (1977)'s Subordinate Clause Hypothesis, J. Emonds (1979)'s Main Clause Hypothesis and De Vries (2002)'s Coordination Hypothesis have been examined in generalizing appositive relative clauses. It has been confirmed that appositive relative clauses can be classified into integrated and non-integrated ones. I propose that Cinques *double-Headed* structure provides a unified account of appositive relative clauses and captures the unique properties observed in Mandarin Chinese appositive relatives, thereby supporting the existence of a sub-type of integrated relative clauses that is the fully-integrated variety.

In Chapter 5, I review the issue of resumptive pronouns in relativization. The types and formation of resumptive pronouns have been summarized. Moreover, the properties of resumptive pronouns and the distribution with definite Heads in Mandarin Chinese have

been discussed under the combination of *double-Headed* structure and *multi-dominance* theory to formalize the resumption issue in relativization. A type of 'weak' resumptive pronouns have been defined in Mandarin Chinese relative clauses due to their specialities.

In all, the conclusion of this thesis is that the combination of Cinque's *double-Headed* structure and *multi-dominance* theory functions as the efficient approach to analyzing the derivation of relative clauses. Mandarin Chinese relative clauses exhibit their specialties in relative constructions and cannot be defined as a kind of non-finite/participial one.

Chapter 2

Analyses of relativization

2.1 Introduction

This chapter aims to build a general picture of relative clauses, which provides a basis for the following analyses of appositives and resumptives in relativization.

The chapter starts with an introduction of relativization approaches in the literature, which covers the *D-complement* (Smith, 1964), *standard theory* (Chomsky et al., 1977; Jackendoff, 1977; J. R. Ross, 1967; R. J. C. Smits, 1988) and the most commonly used *raising/matching* analysis (Bhatt, 2002; Borsley, 1997; Carlson, 1977; Cinque, 2015; De Vries, 2002; Kayne, 1994; Sauerland, 1998; Schachter, 1973; Vergnaud, 1974). There is enough evidence supporting the co-existence of *raising* and *matching* derivations in relativization. Cinque (2015) concludes three main ways to make a distinction between these two approaches, which are extraposition, stacking and sensitivity to weaj islands.

The various structures in relative clauses burden the analysis of relativization. This research adopts Cinque (2020)'s *double-Headed* structure to make a unified analysis of relative constructions. The general syntactic and semantic typology of relative constructions will be illustrated under the *double-Headed* structure to test the plausibility and advantages of this unified approach in relativization. Moreover, the recent *multi-dominance* theory has also been taken to analyze relative constructions. The *multi-dominance* theory proposes that a single syntactic object can be merged in two distinct positions. In this case, this syntactic object marked in the *multi-dominance* can be viewed as a head noun playing its functions in two different positions in relativization. In all, the *double-Headed* and *multi-dominance* provide two possible positions for head nouns. To some degree, the *multi-dominance* theory can can be seen as providing theoretical support forthe *double-Headed* structure. This research combines these two analyzing approaches to specify the double-Headed relative structure and the nature of head noun composition. With this in mind, I move to the central part of this chapter, which starts from the definition of *relative clauses*.

2.2 Defining Relative Clauses

Generally, relative clauses are a kind of clause used to modify or describe nominals. The typical form of relative clauses would be like (1):

(1) The student who is reading the book.

Here, *who is reading the book* is a restrictive relative clause used to modify the definite nominal antecedent *the student*. Here, *who* is a relative pronoun, fulfilling the subject role within the relative clause and introducing it.

However, the types of relative clauses are various cross-linguistically and language-internally. Due to the different manifestations of relative clauses, it is hard to give a universal characterization of relatives from the syntactic level. In this case, typologists prefer to provide a semantic or functional definition to relative clauses. Downing (1978) identifies coreference between elements inside and outside the clause as a universal semantic property of relative clauses. It means that a relative clause is an *assertation* about the relative NP [1] and the *modification* relation is built between a relative clause and its antecedent. Keenan and Comrie (1977) defines any syntactic object to be a relative clause if it specifies a larger set (the *domain* of relativization) and then restricts it to some subsets of which a certain sentence. This purely semantic/functional definition of relative clauses faces the common problem of how to exclude adjectives (e.g., she$_i$ is a beautiful girl$_i$).

Based on the above semantic limitations of defining relative clauses, a more reasonable way is to combine syntactic and semantic or functional notions in the definition. A relative clause is a subordinate clause that delimits the reference of an NP by specifying the role of the referent of that NP in the situation described by the relative clause (Andrews, 2007). Also, De Vries (2002) outlines three defining properties of relative clauses from both syntactic and semantic levels: a relative clause is subordinated; a relative clause is connected to surrounding material by a pivot constituent (the relativized NP); the roles that a relativized NP plays inside and outside of the relative clause are independent of each other. Up to now, I conclude three essential points in characterizing relative clauses (2):

(2) a. Relative clauses are subordinate (be linked in some way to other clauses).
b. Relative clauses perform a specifying function.
c. There are two independent NPs inside and outside relative clauses.

This section offers a universal view of defining relative clauses by combining syntactic and semantic perspectives, laying a foundation for the subsequent discussion of the relativization process.

[1] we refer the coreferential nominal in the relative clause (whether expressed or not) as the relative NP and the coreferential nominal outside the relative clause as the antecedent NP.

2.3 Analyses of relative clauses

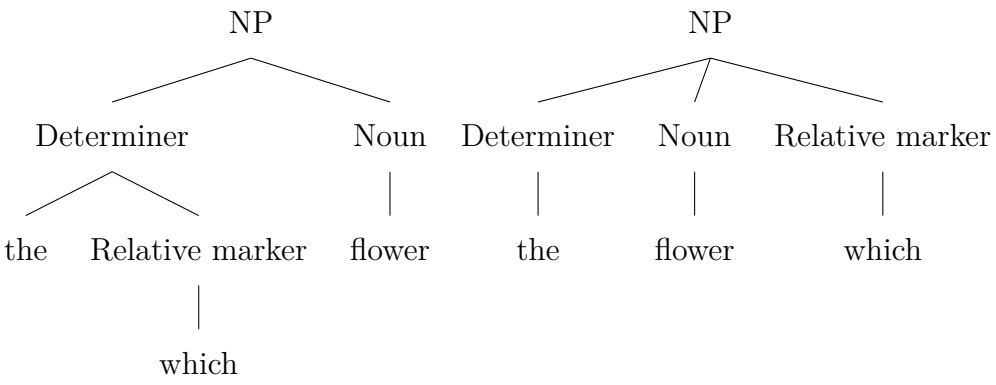
In this section, four major analyzing approaches to relativization will be introduced, which are the *D-complement approach*, the *standard theory*, the *raising approach*, and the *matching approach*. The following section illustrates these approaches.

2.3.1 The D-complement Hypothesis

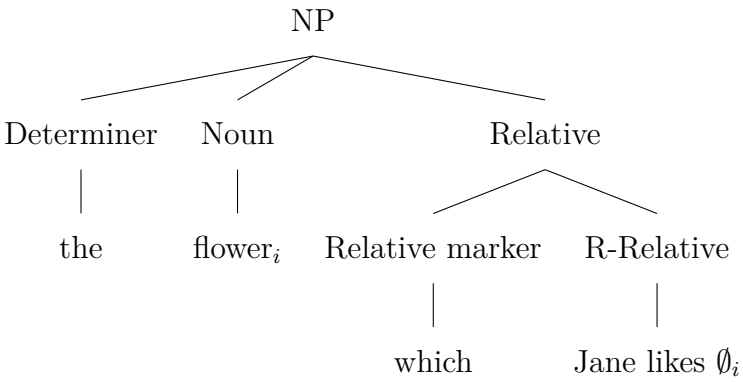
The earliest generative approach to relative clauses is the *Determiner-S* analysis proposed by Smith (1964). According to this analysis, a determiner selects a relative marker. The relative transformation unfolds two steps: first, the relative marker moves to the right of the noun, becoming the node of the noun phrase (order change); second the relative clause adjoining to the left of the relative marker (R-relative adjunction). This results in the linear order: Det-N-relative clause. The existence of a shared noun phrase permits this relative transformation (seen in (3)).

(3) The flower$_i$ which Jane likes $\emptyset_i$.

a. order change



b. R-relative adjunction



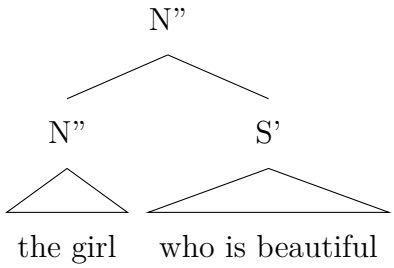
In Smith's analysis, the relativized item *flower* is viewed as the shared noun phrase, with its overt position located outside the relative clause. Here, $\emptyset$ is used to mark the other position of the shared item *flower*. This analysis assumes that relative clauses originate as

the complement of D. Therefore, it has been known as the *D-complement hypothesis*. It is a pity that the *D-complement theory* does not gain widespread attention. In contrast, the more prominent theory of the period is the so-called *standard theory*, which will be introduced in the next section.

2.3.2 The Standard Theory

J. R. Ross (1967) makes the assumption that a relative clause is the right adjunct of an NP based on Chomsky's adjoined theory. The relative transformation can be seen in (4):

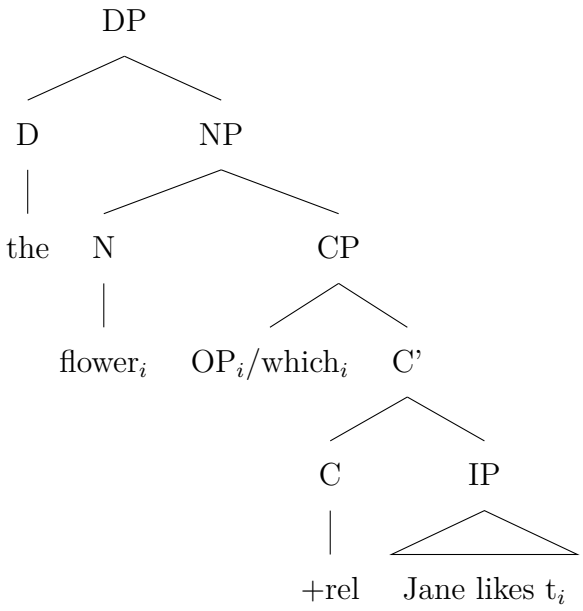
(4) The girl who is beautiful.



This hypothesis simplifies the relation between the relative pronoun and the relativized item. The antecedent of the relative pronoun *who* is the entire lower NP *the girl*. Due to its simplicity, Ross's idea received a lot of support. Jackendoff (1977) adopts this structure and uses it as a basis for distinguishing restrictive relative clauses from appositives (the issue about appositives will be discussed specifically in a later chapter, so here I do not describe it in detail). R. J. C. Smits (1988) interprets this approach as the *standard X′ theory*.

Chomsky et al. (1977) develops this *standard theory* further and tries to analyze the internal syntax of relative clauses. Chomsky analyzes relative clauses as the result of wh-movement, where the wh-movement of a relative pronoun or an empty operator links the variable (i.e., gap) and the COMP-position in relative clauses.

(5) a. [$_{DP}$[$_{D'}$the [$_{NP}$[$_{N'}$flower$_i$ [$_{CP}$ Op$_i$/which$_i$ Jane likes t$_i$]]]]]



Based on Chomsky et al. (1977)'s approach, the syntactic tree can be drawn as (5). In this case [2] The recent *raising* and *matching* analysis, as the widely accepted one, will be shown separately in the following sections.

2.3.3 The Raising Analysis

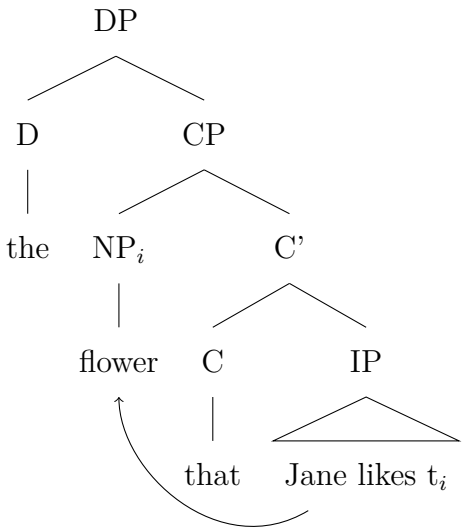
To some degree, the *raising analysis* is developed from Smith (1964)'s *D-complement hypothesis*. Building on this, Vergnaud (1974) proposes that the relative clause originates in a postdeterminer position and moves over the relativized noun. It is the earliest version of the *raising analysis*. Kayne (1994) revives this *raising analysis* in his antisymmetry work ,where an external determiner D selects a relative CP as its complement, and the relativized NP within the CP raises from its base internal position to Spec,CP (seen in (6) (7)). De Vries (2002) enhances the importance of Determiner D in relativization ,characterizing the *raising analysis* as raising plus D-complement.

(6) Without wh-pronoun case

a. [$_{DP}$[$_{D'}$the [$_{CP}$ (that) Jane likes [$_{NP}$ flower]]]]

b. [$_{DP}$[$_{D'}$the [$_{CP}$[$_{NP}$ flower]$_i$ (that) Jane likes t$_i$]]]]]

[2] In wh-movement, the moved phrase functions as the antecedent and its trace acts as, the antecedent *Op$_i$/which$_i$* moves to the Spec, CP position, leaving a trace *t* within the relative clause. The *index* relation between *t* and *Op/which* is also created during this movement, here using *i* to mark this indexing relation. However, a key issue remains: the relativized NP *flower* is assumed to be base-generated outside the relative clause, resulting in no direct link built between *flower* and the operator/relative pronoun *Op/which*. This gap is bridged through *co-indexation*, whereby *flower* is co-indexed with both *Op/which* and its trace *t*.

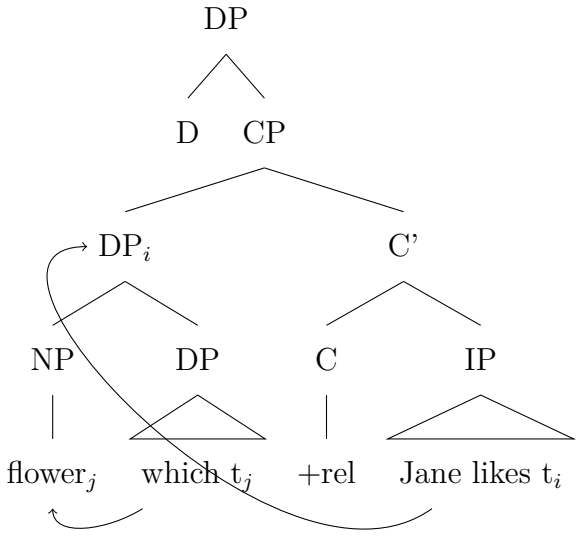


(7) With wh-pronoun case

a. [$_{DP}$[$_{D'}$the [$_{CP}$ Jane likes [$_{DP-rel}$ which [$_{NP}$ flower]]]]]

b. [$_{DP}$[$_{D'}$the [$_{CP}$ [$_{DP-rel}$ which [$_{NP}$ flower]]$_i$ [$_{C'}$ Jane likes t$_i$]]]]

c. [$_{DP}$[$_{D'}$the [$_{CP}$ [$_{DP-rel}$ [$_{NP}$ flower]$_j$ [$_{D'-rel}$ which t$_j$]]$_i$ [$_{C'}$ Jane likes t$_i$]]]]



As shown in (6) where there is no wh-pronoun involved in relativization, the external D *the* selects the relative CP, and the subordinate verb *like* selects the relativized NP *flower*. Obviously, the relativized NP *flower* originates in a position within the relative clause, here using the trace t to mark its original position .It subsequently moves to the Spec,CP position, fulfilling the raising analysis. When a wh-pronoun is present in the relative clause, the structure becomes more complex, as shown in (7). Even in this case,

the relativized NP *flower* still originates within the relative CP. However, it undergoes two successive movements. First, the relativized NP *flower* forms a constituent [$_{D'}$[$_{D}$ which][$_{NP}$ flower]]] with the wh-pronoun *which*. The constituent [$_{D'}$[$_{D}$ which][$_{NP}$ flower]]] raises to the Spec, CP position. To account for surface word order, in which the relativized NP *flower* precedes *which*, a second movement is posited: the NP *flower* moves alone to Spec,DP, thereby preceding the determiner *which*.

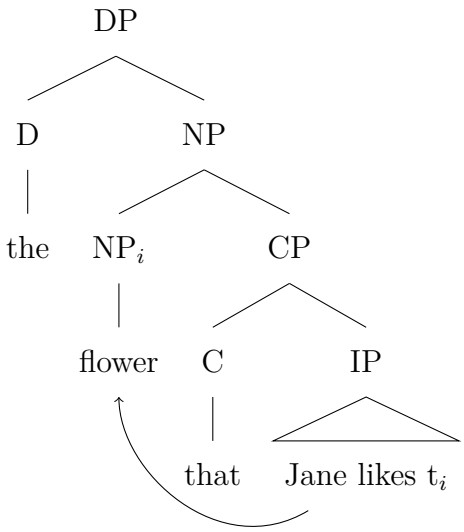
Kayne (1994)'s approach to relativization has generated extensive discussion, particularly regarding the movement of the relativized NP. One widely accepted conclusion is that the relative pronoun cannot be simply put in C position (Bhatt, 2002; Bianchi, 2000; Borsley, 1997; De Vries, 2002). It has been proved by the coexistence of wh-pronouns and complementizers in some languages (see examples in (8)), which indicates that C position is already occupied during the process of relativization.

(8) a. the man who that I saw (Middle English)
b. de stoelen di da kapot zijin (Dutch Dialect)
the chairs which that broken are
(De Vries, 2002)

However, disputes arise in distinguishing between *that*-relatives and *wh*-relatives. One of the most influential modifications to Kayne (1994)'s raising analysis is posted by Bhatt (2002) ,who proposes a notably different configuration. In Bhatts account, the relativized NP is base-generated outside the CP ,while the wh-pronoun leads a constituent that excludes the relativized NP .These represent fundamental departures from Kaynes hypothesis, particularly with regard to the position of the relativized NP and the internal composition of the CP (cf. (9), (10)).

(9) Without wh-pronoun case
a. [$_{DP}$[$_{D'}$the [$_{CP}$ (that) Jane likes [$_{NP}$ flower]]]]

b. [$_{DP}$[$_{D'}$the [$_{NP}$[$_{N'}$ flower]$_i$ [$_{CP}$ (that) Jane likes t$_i$]]]]]

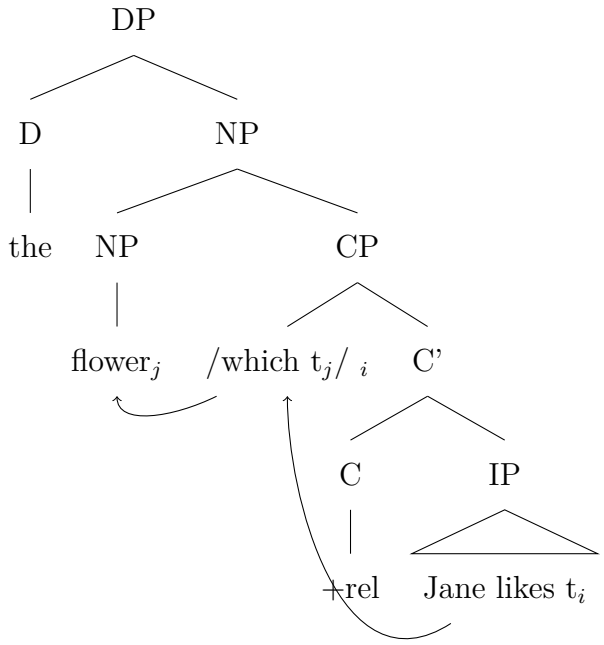


(10) With wh-pronoun case

a. [$_{DP}$[$_{D'}$the [$_{CP}$ Jane likes [$_{DP}$ which [$_{NP}$ flower]]]]]

b. [$_{DP}$[$_{D'}$the [$_{NP}$ [$_{XP}$ which [$_{N'}$ flower]]$_i$ [$_{C'}$ Jane likes t$_i$]]]]

c. [$_{DP}$[$_{D'}$the[$_{NP}$ [$_{N'}$ flower]$_j$ [$_{CP}$ [$_{XP}$ which t$_j$]$_i$ [$_{C'}$Jane likes t$_i$]]]]



In the case without wh-pronoun (9), the relativized NP *flower* originates within CP and finally moves out of the CP to create the NP project. If the wh-pronoun *which* is involved in relativization, the relativized NP *flower* will combine with the relative pronoun *which* as a relative DP constituent in the base position. Then, this relative DP constituent moves and lands in the intermediate position Spec, CP. At this stage, the relative pronoun *which*

is left in this position, while *flower* moves to the higher position (a position projected by an NP).

Bhatt (2002)'s revision addresses several issues left unresolved in Kayne (1994)'s raising analysis. In Kayne (1994)'s structure, *which Jane likes* does not form a constituent if it excludes the NP *flower*. In contrast, Borsley (1997) challenges this claim by demonstrating that sequences like *which Jane likes* do behave syntactically as constituents, as evidenced by their ability to be coordinated, as shown in (11).

(11) the picture [which Bill liked] and [which Mary hated]
(Borsley, 1997)

Moreover, Borsley (1997) raises a significant theoretical concern regarding Kayne (1994)'s analysis: there seems to be no triggers to active the movement of the NP within the DP in Spec, CP. Reviewing the movement of *flower* within DP in (7)), it appears to be the violation of *Anti-locality*. From these two points, the revision of Bhatt (2002) does have its advantages. However, Bhatt (2002) allows the NP to move alone. Thus, it triggers the problem of what can force the pied-piping of DP_{rel} *which flower* in his work.

In all, both versions of *the raising analysis* offer valuable insights into the syntax of relativization, yet each exhibits structural limitations that warrant further refinement. The next part will move to an alternative and widely discussed approach: *the matching analysis*.

2.3.4 The Matching Analysis

The D-complement hypothesis, *the standard theory* and *the raising analysis* have been introduced in the previous sections. By comparison, *the D-complement hypothesis* and *the standard theory* hypotheses the head (the relativized NP) originates outside the relative clause, while *the raising analysis* shows the opposite that the head is base-generated within the relative clause and then moves out. *The matching analysis* is the mix of these approaches, which allows the head to originate either outside or inside the relative clause.

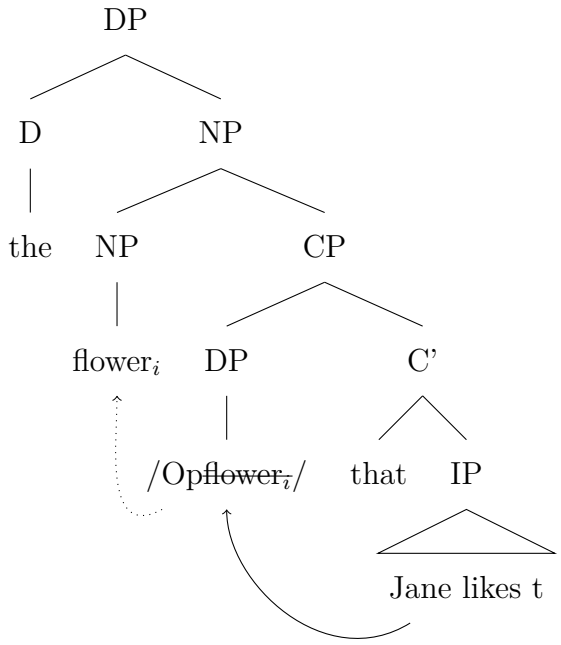
The matching analysis is based on Chomsky (1965)'s transformation of relative clauses (see (12)).

(12) the man[# wh- the man had been fired #] returned to work

Chomsky (1965) defines the transformation of relative clause as an *erasure operation* in which the first *the man* (the term X) erases the following *the man* (the term Y). Obviously, Chomsky (1965) assumes the existence of two NPs in relativization(the term X is outside and term Y is inside the relative clause), and this assumption is advocated by Carlson (1977) and Sauerland (1998). The details of *the matching analysis* are indicated below (13) (14):

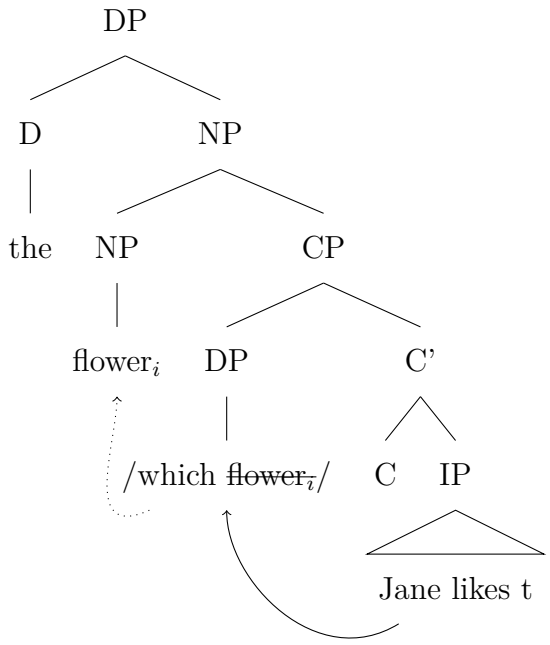
(13) Without wh-pronoun case

a. [$_{DP}$ the [$_{NP}$ [flower$_i$][$_{CP}$~~flower$_i$~~ that Jane likes t]]]]



(14) With wh-pronoun case

a. [$_{DP}$ the [$_{NP}$ [flower$_i$][$_{CP}$[$_{DP}$ which ~~flower$_i$~~]Jane likes t]]]]



In the case without a wh-pronoun (13), the structure contains two instances of the head noun *flower*: one external to the CP, occupying a position projected by NP, and an identical copy internal to the CP. The internal occurrence of *flower* undergoes *relative deletion* after moving to the Spec,CP position, thereby leaving a null operator *Op* in its place. In contrast, the wh-relative clause in (14) differs in that the internal head noun

flower appears as the complement of the wh-pronoun *which*. It originates in the base position and subsequently moves to the surface position together with *which*.

The matching analysis thus circumvents several issues posed by *the raising analysis*, particularly those related to the movement and structural projection of the relativized NP within the relative clause. Nonetheless, the choice between these two approaches in analyzing relativization continues to be a topic of substantial theoretical debate. The following section will examine the applicability of each analysis in greater detail.

2.4 Issues in Approaches to Relativization

The D-complement hypothesis and *the standard theory* are the two earliest approaches to analyzing relative clauses. The former fails to establish a clear syntactic relationship between the head (the relativized NP) and the relative pronoun. In contrast, the latter uses the mechanism *co-indexation* to connect the head noun with both the relative pronoun and the trace. However, neither theory provides a fully transparent binding relation among the head noun, the trace, and the relative pronoun, which limits further exploration of certain issues in relative clause structures. Thus, these two approaches have been gradually replaced by *the raising approach* and *the matching approach*, both of which offer more plausible analyses of relative clauses. The following sections will examine the application and acceptance of these two approaches across different syntactic structures.

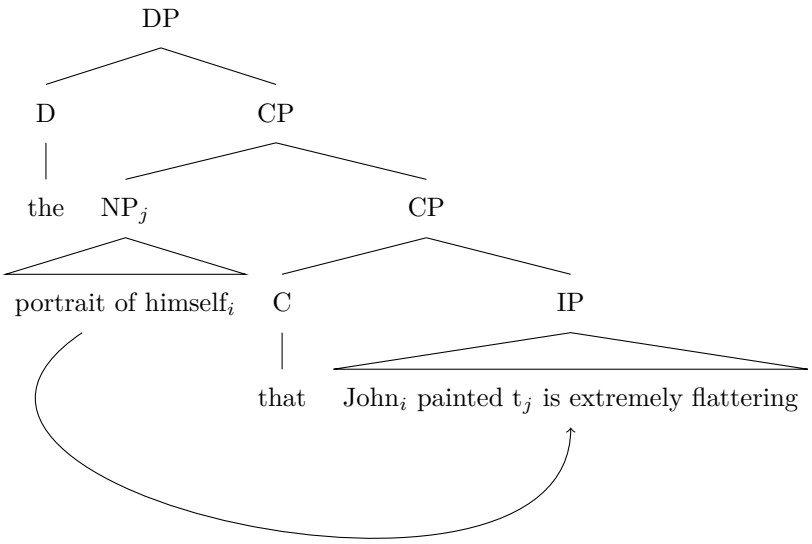
2.4.1 Evidence Supporting the Raising Analysis in Relativization

*The raising analysis*posits that the relativized NP is base-generated within the relative clause and moves out of it finally. This movement is evidenced by phenomena such as *reconstruction*, *idiom chunk interpretation*, and *scope assignment*.

Reconstruction

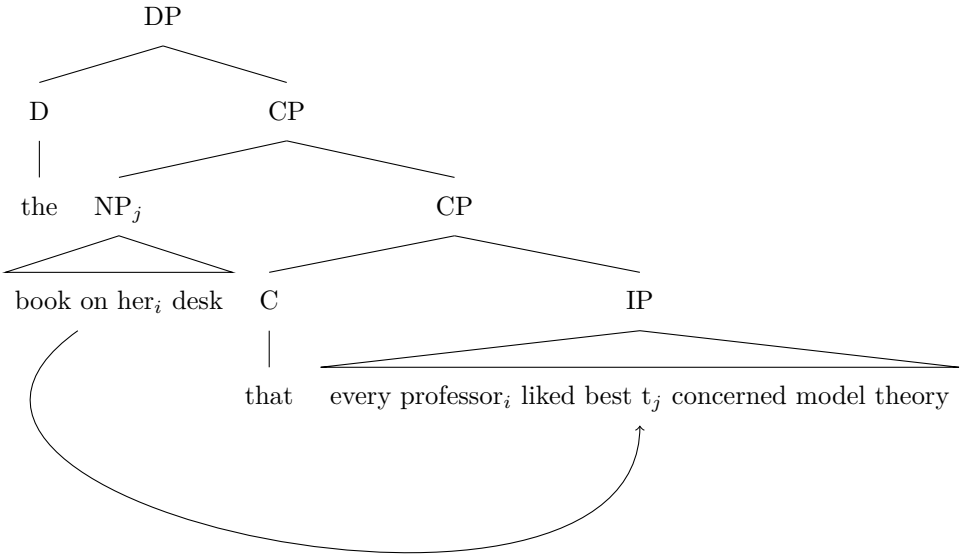
The reconstruction effect in relative clauses focuses on the trace of the relativized NP. It requires the moved relativized NP (the external head) to behave as if it occupied its original position within the relative clause. Thus, the reconstruction effect is evidence for *the raising analysis*. Aoun and Li (2003) correlate the occurrence of reconstruction of the relativized NP inside the relative clause with *the raising analysis*.

(15) The [portrait of himself$_i$]$_j$ that John$_i$ painted t$_j$ is extremely flattering.
(Schachter, 1973)



The example in (15) shows the reconstruction effect in the relative clause. The original position for the reflexive *himself* is within the CP where it satisfies *Principle A* by maintaining its binding relation with the antecedent *John*.

(16) The [book on her$_i$ desk]$_j$ that every professor$_i$ liked best t$_j$ concerned model theory.
(Citko, 2001)



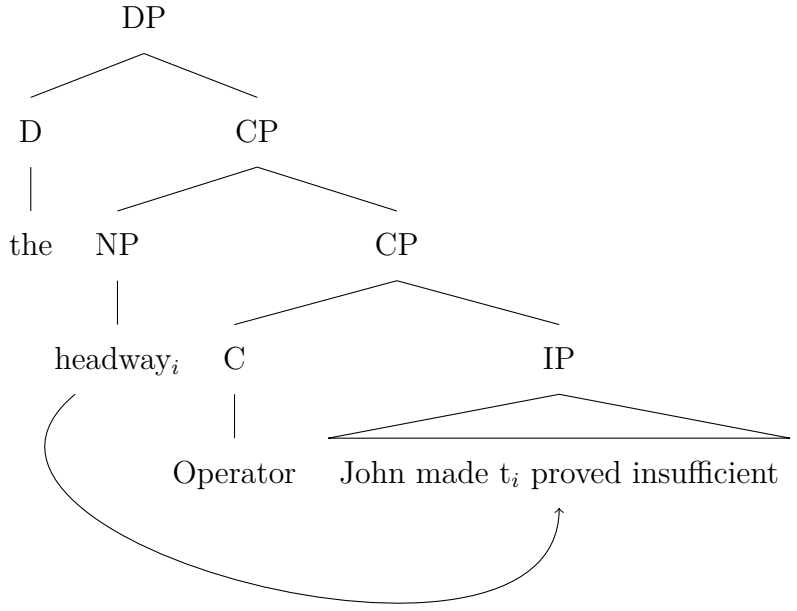
Due to the variable binding relation in (16), *her* functions as a variable pronoun that must be bound by the quantifier NP *every professor*. This binding relation requires that *her* originates within the CP, allowing it to be c-commanded by its antecedent, *every*

professor. In addition to reconstruction effects, *the raising analysis* is also reflected in the interpretation of idiom chunks.

Idiom Chunk Interpretation

Brame (1968) proposes that the head of the relative clause forms an idiom together with other lexical items inside the relative clause.

(17) The headway$_i$ John made t$_i$ proved insufficient.
(Sauerland, 1998)



As shown in (17), the relativized NP *headway* can only appear as part of the idiom *make headway* ,suggesting that its interpretive position is within the CP. This supports the hypothesis of head raising in relative clauses.

Scope Assignment

The scope assignment of the relativized NP is another clear piece of evidence for *the raising analysis*.

(18) No linguist would read the many books$_i$ Gina will need t$_i$ for vet school. (need $\geq$ many)
(Sauerland, 1998)

The preferred interpretation of (18) is *Gina needs so many books for vet school such that no linguist would read that many books*. In this interpretation, it is clear that *need* takes

scope over *many*. A reasonable explanation for this phenomenon is that the relativized NP *books* is interpreted within the relative clause.

The above evidence proves the plausibility of an internal trace of the relativized NP; However, *the matching analysis* also accounts for certain phenomena, which will be introduced in the next section.

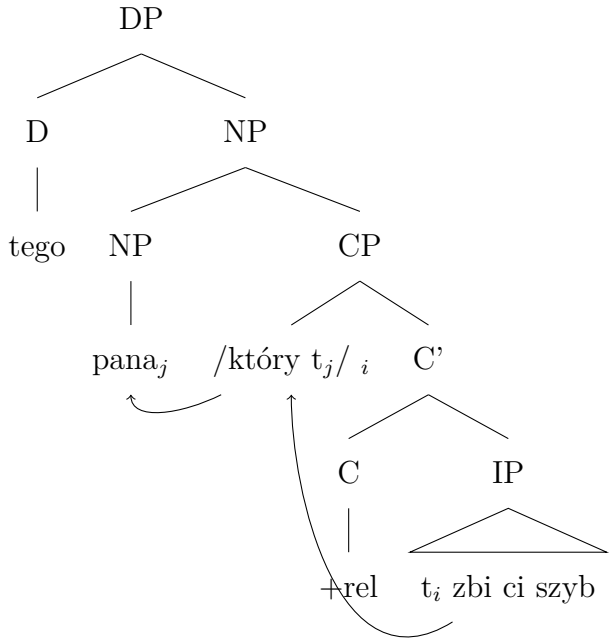
2.4.2 Evidence Supporting the Matching Analysis in Relativization

The raising analysis is hard to explain *case issues*, *negative polarity item licensing* and *violation of Principle C* in relative clauses, where *the matching analysis* reflects its advantage. The following parts focus on evidence supporting *the matching analysis*.

Case Mismatch

Borsley (1997),Citko (2001) and Bianchi (2000) examine case issues in relative clauses , focusing on mismatches between the head and the gap within the relative clause , as well as between the wh-pronoun and the head. Borsley (1997) cites Polish relative clauses as an example since the clear case distinctions in Polish (seen in (19)).

(19) a. widziaem tego pana który zbi ci szyb
saw-1SG this-ACC man-ACC which-NOM broke you glass
'I saw the man who broke your glass' (Borsley, 1997)



In (19), the nominative case is assigned to the relative pronoun *który* 'which', while the relativized NP *pana* 'man' receives the accusative case. This case mismatch is uncommon

in the derivation of a relative clause under *the raising analysis* . In this derivation, *pana który* 'which man' raises from the subject position to Spec, CP, and *pana* 'man' moves further to the specifier of the relative *który* 'which' phrase. According to this derivation, the relativized NP *pana* 'man' ought to receive the nominative case from its original position, but the fact is the opposite, *pana* 'man' receives the accusative case from the external determiner *tego* 'this'. This contradicts the hypothesis of *the raising analysis* , which assumes that the relativized NP originates within the relative clause and then moves out. In contrast, when two relativized NPs are present, and the internal one is deleted under identity as per *the matching analysis*, the accusative case on *pana* makes sense, as the external and internal NPs are assigned different cases in their own positions.

Negative Polarity Item Licensing

The raising analysis also complicates the licensing of negative polarity items in relative clauses. Citko (2001) extends Linebarger (1980)'s *immediate scope constraint* to negation in relative clausesand critiques the plausibility of *the raising analysis*.

(20) a. ∗John didn't give a red cent to every charity.
b. Not ∀x [John gave a red cent to x]
where x = a charity
'It wasn't every charity that John gave a red cent to' (Citko, 2001)

The ungrammaticality of (20) comes from the intervention of *every charity* (the universal quantifier), which blocks the relation between the negative polarity item *red cent* and the negation at LF. If *the raising analysis* is on the right track in relative clauses where the Head requires to undergo LF reconstruction, (21) would be predicted to show similar intervention effects as seen in (20).

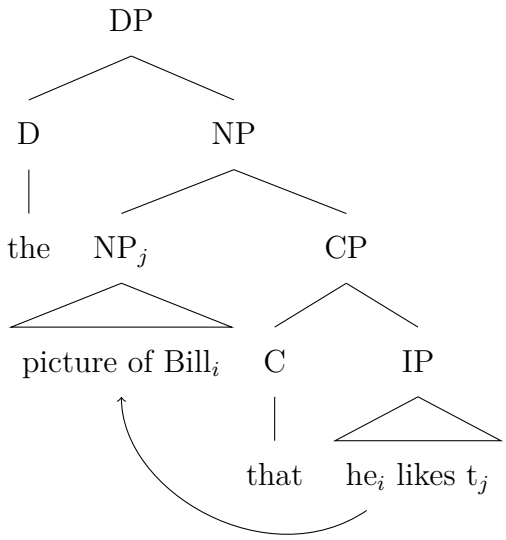
(21) a. Nobody found a [picture of anyone]$_i$ that everybody liked t$_i$.
b. Mary didn't throw away [pictures of anyone]$_i$ that everybody wanted to have t$_i$. (Citko, 2001)

The grammaticality of (21-a) is unexpected under the *immediate scope constraint*. If the Head *picture of anyone* is reconstructed to its original position within the relative clause (21-a), it has been separated from its licensor *nobody*. While the reconstruction causes the intervening item *everybody*(the universal quantifier) in (21-b), thus the Head *picture of anyone* loses the ability to license the negation. These examples show the opposite evidence for *the raising analysis* from the point of scope assignment.

Violation of Principle C

Reconstruction has been considered key evidence for *the raising analysis*, as it reflects the complex referential relations caused by NP movement. Moreover, core binding principles should be detected in relative constructions under *the raising analysis*. However, violations of Principle C do occur during relativization.

(22) the picture of Bill$_i$ that he$_i$ likes. (Munn, 1994)



As shown in (22), where *the raising analysis* is applied, the relativized NP *picture of Bill* moves out of its original position within the CP. This movement causes the violation of Principle C , as the R-expression *Bill* in its original position is c-commanded by the pronoun *he*. Thus, the grammaticality of (22) poses a referential challenge for *the raising analysis*.

Moreover, Sauerland (1998) points out that Principle C effects re-merge in relative clauses involving idiom chunk interpretations, narrow scope readings, and amount readings (e.g., (23) (24) (25)).

(23) a. *The headway on Mary's project she had made pleased the boss.
b. The headway on her project Mary had made pleased the boss.

(24) *The many books for Gina$_i$'s vet school that she$_i$ needs will be expensive.

(25) *It would have taken us all year to read the letters for John$_i$ he$_i$ expected there would be.

Lebeaux (2009) and Safir (1999) hold the view that Principle C reconstruction is not obligatory in relative clauses. However, this perspective does not undermine the effectiveness of the matching analysis, which accounts for such cases by assuming that the internal NP (which would violate Principle C) is deleted during relativization.

The above evidence shows that *the raising analysis* is complex to explain certain phenomena in relative clauses, whereas *the matching analysis* offers a more consistent explanation. Relativization gives rise to ongoing disputes concerning whether the raising analysis or the matching analysis offers a more accurate account, which is the focus of the next section.

2.4.3 *Raising Analysis* or *Matching Analysis*?

The structural variation of relative clauses across languages cause difficulties in determing approaches to relativization. Considering the evidence shown above, it is unreasonable to apply only *the raising analysis* or *the matching analysis* to all relative clauses. Carlson (1977) proposes that *the raising analysis* and *the matching analysis* should be integrated, with the choice between them depending on the semantic properties of the Head and the variable found within the relative clause. This division of labor between the two approaches has been advocated by Åfarli (1994), Bhatt (2002), Grosu and Landman (1998), and Heim (1987). Cinque (2015) concludes three obvious phenomena to discriminating between *the raising* and *matching* analyses of relative clauses, which are *extraposition*, *stacking* and *weak island sensitivity*.

Extraposition

Cinque (2015) holds the view that extraposition of relative clause is incompatible with *the raising analysis*. This claim builds on Harris (2008)'s explanation of ambiguous sentences found in Heim (1987)'s work. Heim (1979) suggests that the sentence in (26) is ambiguous, allowing for two distinct interpretations, as illustrated in (27).

(26) John guessed the price that Mary guessed. (Heim, 1979)

(27) a. John and Mary guesses the price independently. However, it suggests that they have to guess the identity of the same price.

b. John's guess is regarding to Mary's guess. It means John answers to the question 'what price did Mary guess?'

Harris (2008) proposes that the two readings in (27) reflect structural ambiguity. The interpretation in (27-a) aligns with *the matching analysis* of relative clauses, while the reading in (27-b) comes from *the raising analysis*.

(28) John guessed [the [price [that Mary guessed]].

a. John guessed [$_{DP}$[$_{D'}$the [$_{NP}$[$_{N'}$ price]$_i$ [$_{CP}$ that Mary guessed t$_i$]]]]]. (Raising)

b. John guessed [$_{DP}$ the [$_{NP}$ [price$_j$][$_{CP}$~~price$_i$~~ that Mary guessed t$_i$]]]]. (Matching)

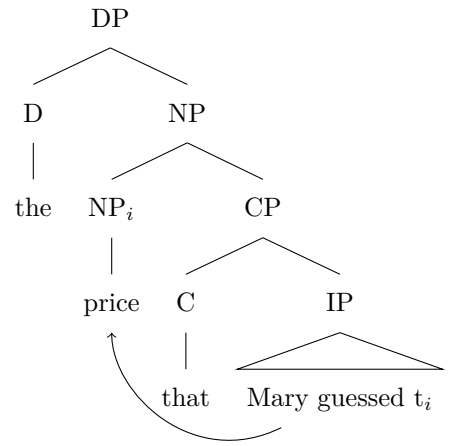


Figure 1:The raising derivation (28-a)

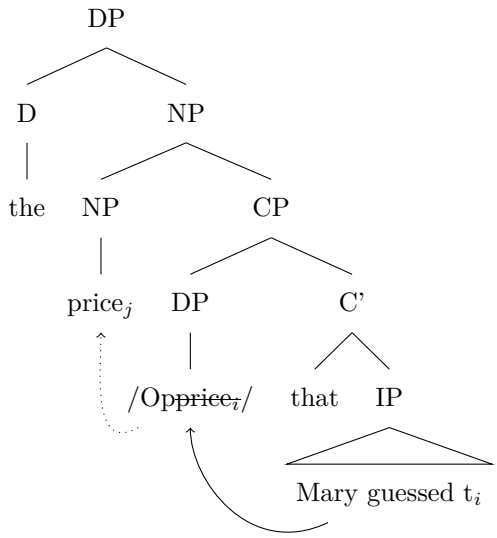


Figure 2:The matching derivation (28)b

Under *the matching analysis*, there is no direct relation built between the relativized NP *price* in the matrix clause and the relative clause. Thus, the interpretation of (27-a) can be received. In contrast, *the raising analysis* requires the relativized NP *price* to retain the same information it had in its original position within the relative clause, which gives rise to the reading in (27-b). Moreover, Harris (2008) points out that when an adjunct is added to the sentence *John guessed the price that Mary guessed* , and the relative clause is extraposed beyond the adjunct, the interpretation associated with *the raising analysis* is no longer available, as illustrated in (29).

(29) John guessed the price yesterday that Mary guessed.
John guessed [the price t_i] yesterday [that Mary guessed]$_i$. (The extraposition of the relative clause)

a. John and Mary both knew the same price yesterday.
b. *John knew which price Mary knew yesterday.

The disappearance of the interpretation in (27-b) ,which arises under *the raising analysis*, suggests an incompatibility between *extraposition* and *the raising analysis*. This contrast provides a useful diagnostic for distinguishing between *the raising analysis* and *the matching analysis*.

Stacking

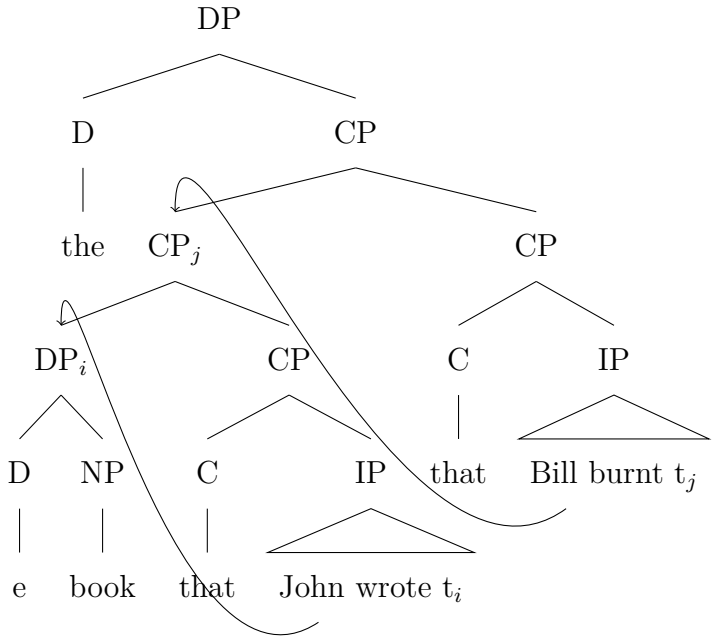
A second approach to dividing the labor between *the raising analysis* and *the matching analysis* is their ability to accommodate stacking. Borsley (1997) holds the view that *stacking* in relative clauses highlights inherent issues with the raising analysis, as illustrated in (30) and (31). Furthermore, Carlson (1977), Grosu (n.d.), and Grosu and Landman (1998) analyze and compare specific cases of relative clauses with varying structures,

suggesting that *the matching analysis* is more acceptable in the case of stacked relative clauses.

(30) The stacking in *that*-relatives.

a. the book that John wrote that Bill burnt. (*The raising analysis*)

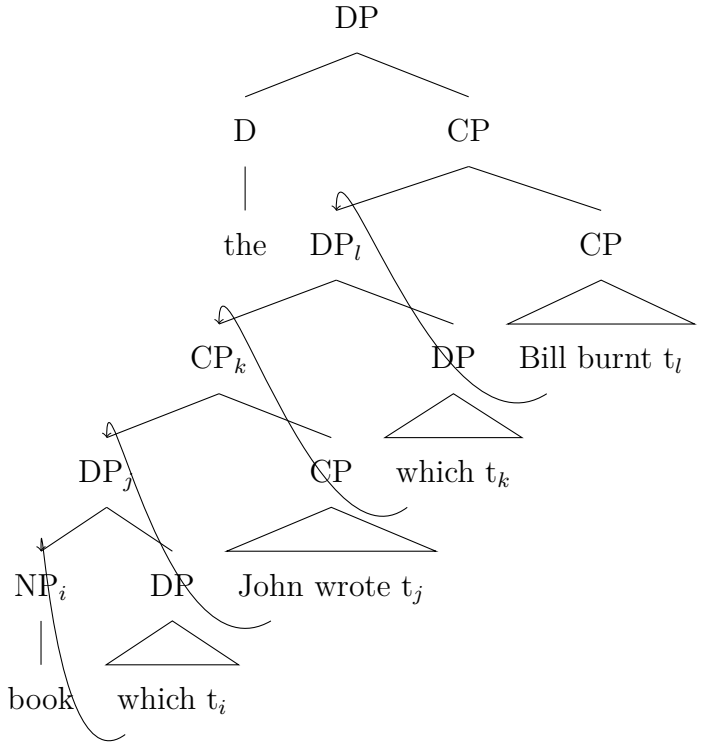
b.



(31) The stacking in *wh*-relative

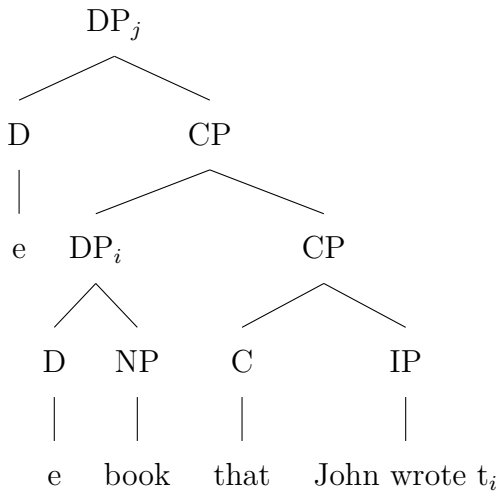
a. the book which John wrote which Bill burnt. (*The raising analysis*)

b.



Examples (30) (31) reflect the derivation of *that*-relatives and *wh*-relatives under *the raising* approach , respectively, both of which encounter syntactic challenges. In (30), the verb *burn* takes the CP-trace *book that John wrote* as its complement, which disobeys the rule that the verb *burn* is not allowed to take an overt CP. Some mechanisms are necessary here to convert this CP-trace to a DP-trace. Borsley (1997) hypotheses that the only way to deal with it is to prove the existence of two empty Ds in the first CP *book that John wrote*, as shown in(32).

(32)



Furthermore, another issue raised in (30) is that an overt complementizer cannot co-occur with a filled Spec,CP, a constraint that also applies to the wh-relatives in (31). In (31), the second *which* takes the CP-trace *book which John wrote* as its complement. However,this structure violates the English constraint that the interrogative *which* cannot take an overt CP as its complement (Borsley, 1997),as illustrated in (33).

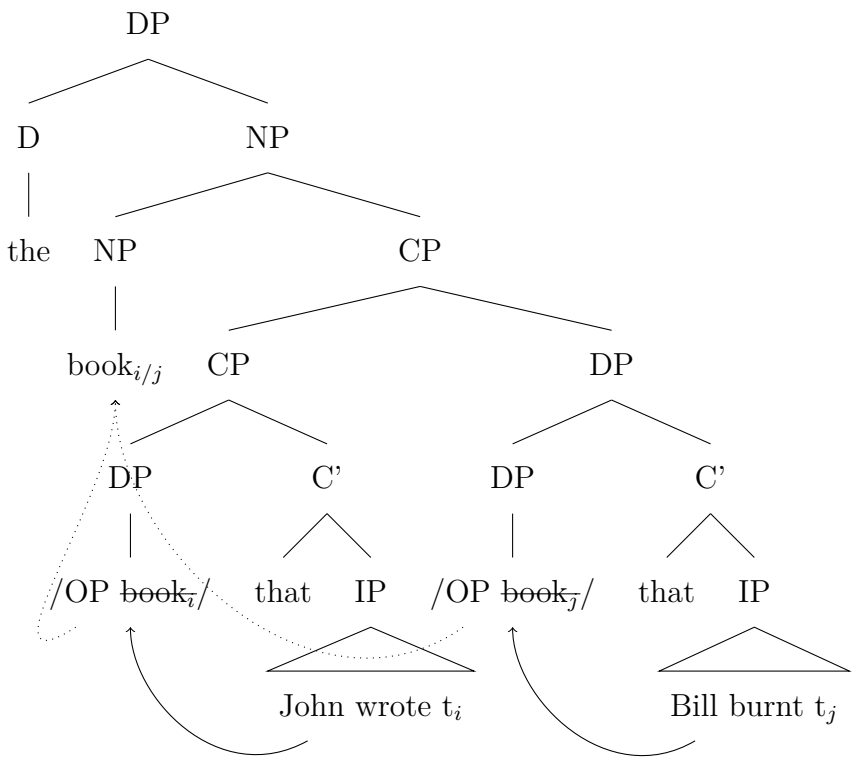
(33) * Which that John was here did Bill believe.

If *the matching analysis*, which allows an internal head (relativized NP) within the relative clause, has been applied here to analyze the sentences in (30) and (31), the issues raised by Borsley (1997) can be avoided.

(34) The stacking in *that*-relatives.

a. the book that John wrote that Bill burnt. (*The matching analysis*)

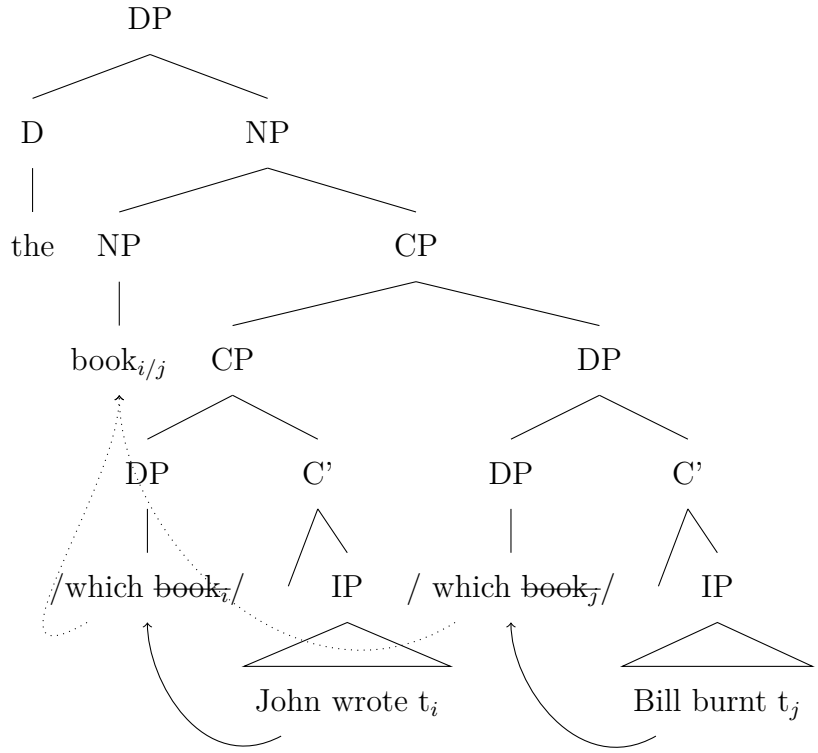
b.



(35) The stacking in *wh*-relative

a. the book which John wrote which Bill burnt. (*The matching analysis*)

b.



As shown in (34) and (35), *the matching analysis* resolves the issues posed by *the raising analysis*, in which thethat verb *burn* and the CP *which Bill burnt* incorrectly take the CP-trace *book that/which John wrote* as their complements. The example in (34) indicates

that the two relative clauses each contain their own internal heads, $book_i$ and $book_j$,which can independently form DPs with null operators when raised from their original positions within the clauses. in their structures separately, and $book_i book_j$ are able to form DP with null operators when they move out of the internal position. This allows the second relative clause *that Bill burnt* to function as a DP, making it syntactically valid as a complement to the first clause *that John wrote*. The overt head $book_{i/j}$ can delete both $book_i$ and $book_j$ via *relative deletion*. The derivation of the wh-relatives in (35) follows a parallel pattern, differing only in the presence of overt operators *which*. Thus, *the matching analysis* offers a coherent solution to the syntactic challenges of stacked relatives raised by Borsley (1997).

Furthermore, Carlson (1977) points out that stacking is actually disallowed in some cases (seen in (36)).

(36) a. *We can make any headway that Fred might laugh at.
Cf. Fred might laugh at any headway we can make.
b. *Max might make what headway MEl heard of.
Cf. Mel heard of what headway Max might make.

A review of the example in (17) supports the claim that idiom chunk interpretation is convincing evidence for *the raising analysis*. However, as shown in (36), the idiom chunck *the headway we made* does not permit stacked relative clauses, indicating that stacking is incompatible with *the raising analysis*. Based on Carlson (1977)'s analysis of stacking, Grosu and Landman (1998) proposes that the failure of stacking in relative clauses is due to head nouns cannot be interpreted in more than one relative clause.

(37) a. *The one sailor that there was on the boat that there had been on the island died in the explosion.
b. The one sailor who was on the boat who had been on the island died in the explosion.

In (37-a), the relativized NP *one sailor* is interpreted in the first CP position to receive the interpretation *that there was one sailor on the boat*. However, the issue arises with the expected interpretation of the second CP *that there one sailor had been on the island*, which also needs *one sailor*. Although *one sailor* has its base position within the relative clause according to *the raising analysis*, it is not possible for it to originate in the second CP *that there had been on the island* and then moves out to the first CP *that there was on the boat*, which will disobey the *Extension Condition*. Thus, the grammaticality of (37-b) indicates that the relativized NP *one sailor* is external to the relative clause. The external feature of the relativized NP proved in this example enhances the hypothesis that *the raising analysis* is incompatible with stacked relative clauses. In contrast, *the matching analysis* is an efficient alternative in this case.

Weak island sensitivity

In addition to *extraposition* and *stacking*, Cinque (2015) also considers sensitivity to weak islands as a key factor in distinguishing between *the raising analysis* and *the matching analysis*. Evidence shows that the raised head tends to be sensitive to weak islands.

(38) a. This is the way that I think he should behave.
b. *This is the way$_i$ that I want to know [$_{weakisland}$whether he behaved t$_i$]. (wh-island)
c. *This is the only way$_i$ that [$_{weakisland}$ he didn't behave t$_i$]. (negative island)
d. *This is the way$_i$ that I regret that [$_{weakisland}$ he behaved t$_i$]. (factive island)
e. *That is the way$_i$ that it was time that [$_{weakisland}$ he behaved t$_i$]. (extraposition island) (Cinque, 2015; Rizzi, 1990)

This evidence denies the plausibility of *the matching analysis* with respect to relativization involving weak islands. Cinque (1990) supposes that the NP gap left by movement is an empty resumptive pronoun instead of a trace, also Chomsky (2014) holds a similar view that the trace is an unpronounced occurrence rather than an empty position. Thus, it is plausible to view the trace t in relative clauses as a variable under *the raising analysis*. Szabolcsi and Zwarts (1993) assumes that all weak islands are scopal. The denotation domain of the raised head *way* in its final position (external to the relative clause) cannot encompass the operations associated with weak islands. This implies the raised head *way* in its final position can not take scope over its trace t , leading to semantic deviation in (38). Szabolcsi and Lohndal (2017) agrees that weak islands are sensitive to the identity of the extracted item. Different from *the raising analysis*, *the matching analysis* hypotheses the existence of both external Heads and internal Heads in relativization, without involving the extraction of the Head . Consequently, the deleted Head is treated as a discrete individual which should not be constrained by scope issues. The violation shown in (38) suggests that these sentences are derived from the movement of the relativized Heads, consistent with the application of *the raising analysis*.

As shown above, *the raising analysis* and *the matching analysis* represent distinct approaches to deriving relative clauses: one through movement and the other through non-movement. There exists a kind of complementary relation between these two analyses. Based on this , Cinque (2015) proposes the plausibility of combining *the raising analysis* and *the matching analysis* to create a unified approach or structure for relative clauses. Cinque (2020) renames this combination as *the double-Headed structure* for relative clauses. The next section will introduce *the double-headed structure* in detail.

2.5 Cinque's double-Headed structure

The previous section proves the plausibility that both *the raising analysis* and *the matching analysis* are necessary concerning their respective strengths and limitations in accounting for relative clauses with varying structures. Cinque (2020) proposes the *double-headed structure* as a unified framework for analyzing all types of relative clauses. Within this approach, the traditional notions of *raising* and *matching* are redefined, offering a more comprehensive account of relativization across different syntactic environments. Cinque (2020) proposes that the different types of relative clauses attested cross-linguistically can be derived from a single, double-Headed, universal structure via different syntactic operation: *raising* and *matching* [3].

The *double-Headed structure* posits that the only Merge position of relatives clauses is pre-nominal, and their surface post-nominal position is derived by the leftward movement of the relativized NP (see in (39)).

(39) $[...[_{XP}\ \mathbf{RC}[_{XP}\ \text{X}[...[_{NP}\ \mathbf{N}]]]]]$

Example (39) is built on Greenberg (1963)'s typological generalization regarding the order of nouns and their modifiers: if any or all the items (demonstrative, numeral, adjective) precede the noun (it is found in most languages), then the surface order is either the same or its exact opposite. As analyzed in the very beginning, the relative clauses are commonly used to modify the NP. Thus, it is plausible to assume that relative clauses originate in a pre-nominal position and subsequently undergo movement to a post-nominal position in certain languages. While the post-nominal position of relative clauses can be tracked in the traditional *matching analysis* via right-adjunction to the NP (as illustrated in (13)), Cinque (1990, 2015, 2020) points out that such a derivation fails to comply with the antisymmetry requirement proposed by Kayne (1994).

Under the assumption that relative clauses are merged in a pre-nominal position, the *double-Heade structure* allows for the occurrence of two Heads in relativization: one *external* and one *internal*. To some degree, the *double-Headed structure* bears a resemblance to the traditional *matching analysis*, as both posit the existence of two Heads within the relative construction and involve the deletion of one Head under identity.

(40) a. **gana** gu fali-kha **ro**...(Kombai)
bush.knife 2SG carry-go.2SG.NONFUT **thing**...
'the bush knife that you took away' (Vries et al., 1993)

b. trabiha ti hu nåna'i na'ån-ña i
still NEG 1SG.R.AGR give.PROG name-3SG.POSS the

[3]The definition of *raising* and *matching* here needs to be distinguished from those in *the raising analysis* and *the matching analysis*

ga'-hu ni hu adopta na **katu** gi ma'pus na
animal-1SG.POSS COMP 1SG.R.AGR adopt LK **cat** LOC last lk
simåna (Chamorro)
week
'I still haven't given a name to my pet cat that I adopted last week' (Vincent, 2017)

c. xiaonvhai zai kan **dianshi** de **dianshi** (Mandarin)
little-girl DUR watch **TV** DE **TV**
'the TV which the little girl is watching' (Natalie Hsu et al., 2009)

d. Ine-in **koyun-u** it-ti-i **koyun** (Turkish)
cow-Gen **sheep**-ACC push-DIK-3SG.POSS **sheep**
'the sheep that the cow pushed the cow' (Ozge et al., 2010)

e. sur la **balle** qu' il lance la **balle** (French)
over DET.F **ball** that 3SMg catches.PRS.3SG DET.F **ball**
'the ball that he catches over' (Pérez-Leroux, 1995)

Supporting evidence for the hypothesis of *double-Headed structure* in relativization comes from the existence of overt double-Headed relative clauses in some languages. Examples from Kombai and Chamorro are provided in (40-a) and (40-b). [4]In these examples, the relativized NP appears in two forms *gana, ro* and *ga'hu, katu* . Dryer et al. (2013) refer to such constructions as *double-Headed relative clauses* , characterized by the presence of bothsince they have an external head and a corresponding noun within the relative clause. These examples support to Cinque's *double-Headed* hypothesis in relativization. Additional evidence comes from child language, where double-headed structures are more transparently attested, as shown in (40-c)(40-e). Natalie Hsu et al. (2009) views this language phenomenon in children's language as resumptive NP errors, which means the head noun is mistakenly duplicated at the gap position within the relative clause. This phenomenon provides a novel angle from which to assess the applicability of the *double-Headed structure* in relativization.

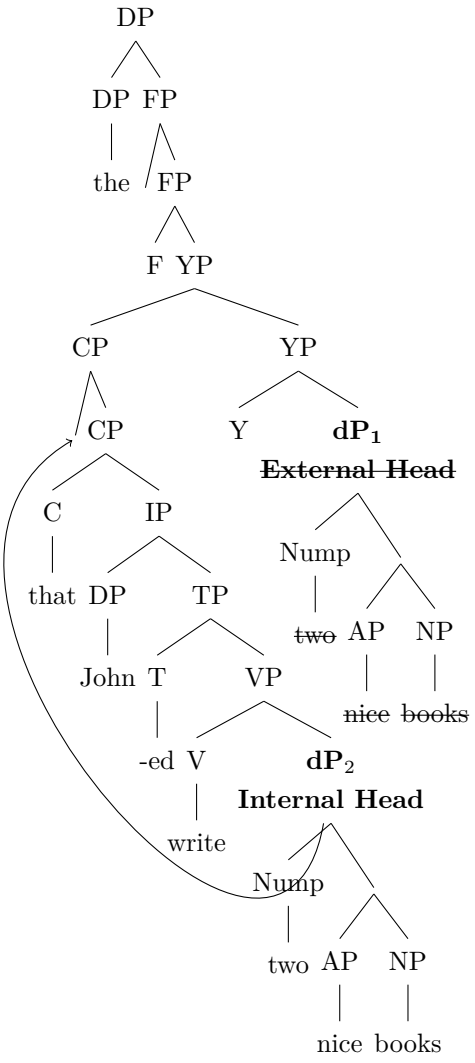
If the two head nouns hypothesis in relative clauses is on the right track, the properties of two Heads need further analysis. According to Cinque (2020)'s hypothesis, the *external* Head is always indefinite and forms part of the extended projection of the NP. It is modified and c-commanded by the relative clause. In contrast, the *internal* head, also a constituent of the NPs extended projection, originates within the relative clause and does not own the indefiniteness absolutely. A *dP*, smaller than a full DP, is used to mark two Heads (internal and external) under the double-headed structure. This *dP* can host quantifiers, numbers, adjectives, and determiners. Although it lacks a strong determiner like that in a full DP, it can still function as an antecedent for pronouns or PRO, and it is capable of licensing parasitic gaps (see in (41)).

[4]Kombai is a Papuan language of Boven Digoel Regency in Indonesian New Guinea. Chamborro is a language of the Marianas (Guam and the Commonwealth of the Northern Mariana Islands. Guam is a US territory while the CNMI has greater autonomy as a US commonwealth)

(41) a. The [boy]$_i$ that t$_i$ said he$_i$ would come...
b. The [boy]$_i$ that t$_i$ refuse PRO$_i$ to work for you...
c. The [boy]$_i$ that John invited t$_i$ without really knowing e$_i$ will...

Moreover, the terms *raising* and *matching* in the context of the *double-Headed structure* refer to two distinct operations involved in deriving relative clauses. The *raising* derivation refers to the case where the overt Head is the internal Head. This internal Head is raised to the Spec,CP position and causes the deletion of the external Head here. Conversely, when the internal head is deleted and the external head remains overt, the derivation is classified as *matching*. This *matching* derivation is divided into two cases: *fully matching* and *partially matching*. In the former, the internal Head is an exact match of the external Head and is deleted under identity. In the latter, the external Head is not able to delete the internal Head completely due to the partially matching relation between these two heads. In this case, the internal Head needs to be represented by a preform, which is commonly composed of a wh-pronoun or a resumptive pronoun or an epithet. These derivations within the *double-Headed structure* are illustrated in (42) and (43).

(42) The *raising* derivation under double-Headed structure
The two nice books that John wrote.

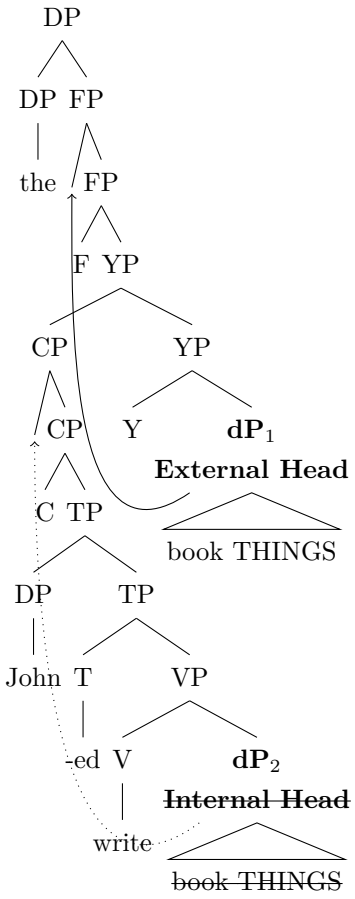


(42) shows the *raising* operation within the *double-Headed* structure. In this configuration, there are two Heads *two nice books*: one is within the relative clause (marked as dP_2), and one is outside the relative clause (marked as dP_1). The dP_1 and dP_2, containing NumP *two* and AP *nice*, are exact matches of each other. According to the principle of relative deletion, one of the two heads must be deleted in the derivation. The interpretation of this sentence can be 'John wrote the two nice books' exhibits a reconstruction effect , indicating that the overt head must occupy a position within the CP. Thus, the internal Head (dP_2) raises to Spec, CP , establishing a c-command relation with the external Head (dP_1) and licenses the deletion of the dP_1 under identity. Compared with *the raising analysis* introduced previously (review in (6)(7)(9)(10)), which follows Kayne (1994)'s idea that the head noun raises outside the CP eventually. Here, the final position for the overt head noun *two nice books* remains within the CP, which avoids some potential problems in the traditional *raising analysis*. Specifically, positing the head outside the CP would contradict the observation that the head of amount/maximalizing relative clauses can undergo extraposition [5].

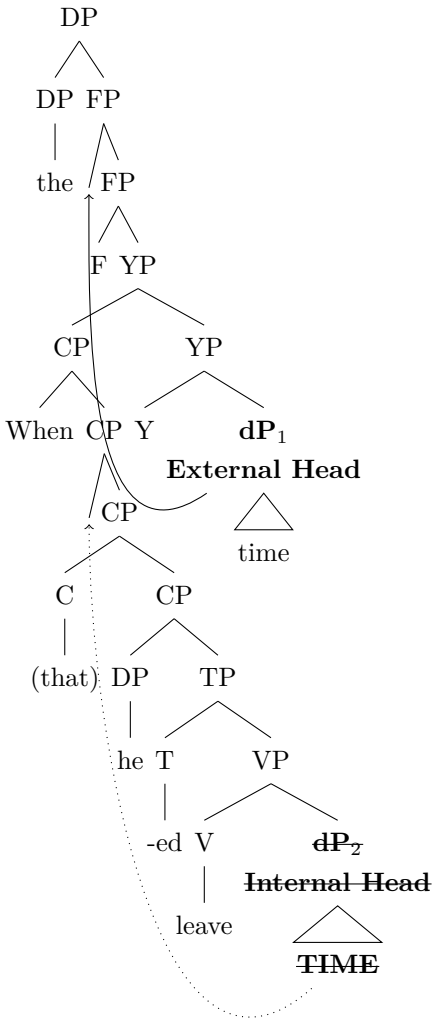
(43) The *matching* derivation under double-Headed structure

[5]The amount/maximalizing relative clauses are a form of non-restrictive relative clauses. The division and properties of different kinds of relative clauses will be discussed in detail in the following part

a. The books that John wrote. (the individual reading)



b. The time when he left.



As shown in (43), the *matching* derivation under the *double-Headed structure* encompasses two subtypes: (43-a) reflects the case of a *full match*, while (43-b) represents a *partial match*. If the overt Head *book* does not need to be interpreted inside the relative clause, the raising derivation is no longer accessible. Due to the structure of postnominal relative clauses in English, both dP_1 and dP_2 need to be raised to higher syntactic positions. The internal head dP_2 moves to Spec,CP, as in the raising derivation, whereas the overt head dP_1 raises to Spec,FP, triggering the deletion of dP_2. In (43-a), there is no categorical distinction between dP_1 *book THINGS* and dP_2 *book THINGS*, which means they are fully matching. As a result, dP_1 is able to delete dP_2 fully. However, (43-b) denotes the difference, where the external *time* and internal *TIME* Heads are categorically distinct. Thus, dP_1 cannot fully delete dP_2 upon raising to Spec, FP. In this case, the remaining unmatched portion of dP_2 will be realized by a wh-pronoun *when*. The entire internal head dP_2 moves to Spec,CP, but only the part identical to dP_1 is deleted under identity. The unmatched portion, represented by the wh-element *when*, raises further within the clause.

The *double-Headed structure* builds two chains for deriving relative clauses, which are stacked together. The lower chain contains the internal head dP_2, while the upper one involves the external head dP_1. The existence of the upper one is to change the order between a head noun and a relative clause to meet the antisymmetry requirement. An early version of this approach can be found in Cinque (2015)'s work, while Cinque (2020) offers a more comprehensive and systematic account, formally naming the configuration the *double-Headed structure*. Moreover, Cinque (2020) classifies various kinds of relative clauses and outlines the strategies of relativization within this unified framework, which is the core of the following parts.

2.6 Typology of Relative Clauses

The *double-Headed structure* emphasizes the roles of the internal and external head nouns in relativization. In this framework, the deletion and movement of the two Heads in relative constructions reflect the derivational options (*raising* or *matching*) and changes in word order. Cinque (2020) proposes that all types of relative clauses can be unified under a single *double-Headed* structure. To reach this proposal, a precise classification of relative clause structures is essential. His approach to defining various kinds of relative constructions can be traced back to the idea of Dryer et al. (2013), which focuses on the position of the overt head noun. Relative clauses are primarily divided into two categories: one based on syntax and the other on semantics. The following sections will explore the classification of relative clauses and the application of the *double-Headed* hypothesis.

2.6.1 The Syntactic Typology of Relative Clauses

Based on Dryer et al. (2013)'s analysis, seven types of relative clauses are attested across languages: externally Headed post-nominal, externally Headed pre-nominal, internally Headed, double-headed, Headless, correlative, and adjoined relative clauses.

(44) Externally Headed post-nominal relative clauses

the **books** [$_{Rel}$ that John wrote] (English)

(45) Externally Headed pre-nominal relative clauses

[$_{Rel}$ Mary xihuan de] **hua** (Mandarin)
Mary like DE flower
'the flower that Mary likes'

(46) Internally Headed relative clauses

[$_{Rel}$ xwancha-q **runa** riku-sqa-n wasi-ta rura-n] (Cuzco Quechua)
Juan-GEN man-OBJ see-NML-3 house-ACC build-3
'the man that Juan saw builds a house' (Lefebvre & Muysken, 2012)

(47) Double-Headed relative clauses

[$_{Rel}$ **gana** gu fali-kha] **ro**...(Kombai)
bush.knife 2SG carry-go.2SG.NONFUT thing...
'the bush knife that you took away' (Vries et al., 1993)

(48) Headless relative clauses

[$_{Rel}$ **what** you did] (English)

(49) Correlative relative clauses

[$_{Rel}$ jo **laRkii** khaRii hai] vo lambii hai (Hindi)
REL girl standing is DEM tall is
'the girl who is standing is tall' (Srivastav, 1991a)

(50) Adjoined relative clauses

*ŋ*atulu-lu x-na **yankiri** pantu-nu [$_{Rel}$ kutja-lpa *ŋ*apa *ŋ*a-nu]
I-erg AUX emu supear-PAST C-PAST water drink-PAST
(Walpiri)

'I speared the emu which was drinking water' (Hale, 1976)

Examples from (44) to (50) provide an overview of various kinds of relative clauses. The following sections will demonstrate how to apply the *double-Headed* approach into analyzing these structures.

Externally Headed Post-nominal and Pre-nominal Relative Clauses

The externally Headed post-nominal and pre-nominal relative clauses offer a useful comparison that highlights variations in the liner order between the Head and the relative clause in relativization. In the post-nominal type, the head noun precedes the relative clause, as shown in (44), whereas in the pre-nominal type, the relative clause comes before the head noun, as seen in (45). Within the framework of the *double-Headed* structure, these differences in surface word order are accounted for by the movement of either the heads or the CP, as illustrated in (51) and (52).

(51) The **books** [that John wrote].

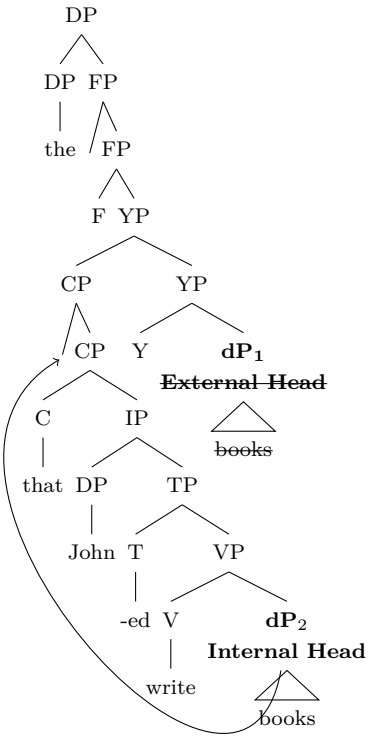


Figure 1:The raising derivation

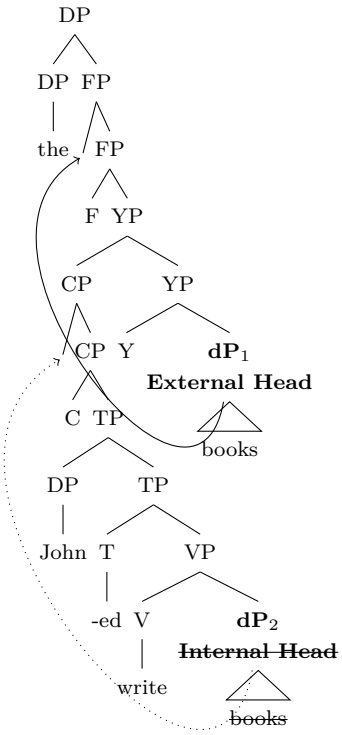


Figure 2:The matching derivation

The example in (51) reflects the *raising* and *matching* derivations within post-nominal relative clauses [6]. In Figure 1 (*raising* operation), the internal Head (dP_2) *books* raises to Spec,CP and licenses the deletion of the external one (dP_1) *books*, ultimately surfacing as the overt Head. The raised internal Head (dP_2) *books* is in an intrinsic operator position, granting it operator status and allowing it to license its trace as a variable. In Figure 2 (*matching* operation), the external Head (dP_1) *books* surfaces as overt. It raises to a position higher than CP (Spec,FP) , licensing the deletion of the internal one (dP_2) *books* within CP. Cinque (2017) points out that in head-initial languages, if a DP is modified by elements such as adjectives or relative clauses, the NP must undergo roll-up movement and raise above its modifiers. Considering that relative clauses act as modifiers within relativization, the overt Heads (dP_1) in such constructions is expected to raise above the CP in head-initial languages. This analysis accounts for the surface formation of externally headed post-nominal relative clauses. From the above analysis, it is evident that the base Merge position of relative clauses is pre-nominal. However, the application of *double-Headed structure* to externally headed pre-nominal relative clauses presents greater complexity than its application to post-nominal one (see in (52)).

(52) [Mary xihuan de] **hua** 'the flower that Mary likes'

[6]The specific discussion about *raising* and *matching* operations under the *double-headed* structure has been shown in a previous section (seen in (42)(43)). Thus, this part focuses specifically on changes in word order within relativization.

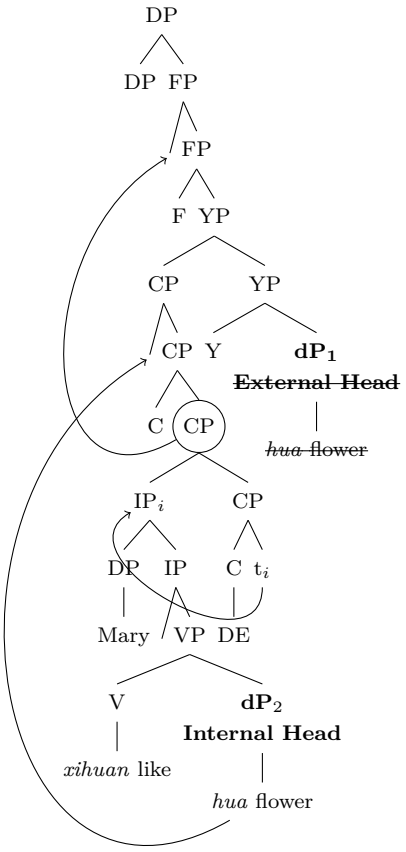


Figure 1:The raising derivation

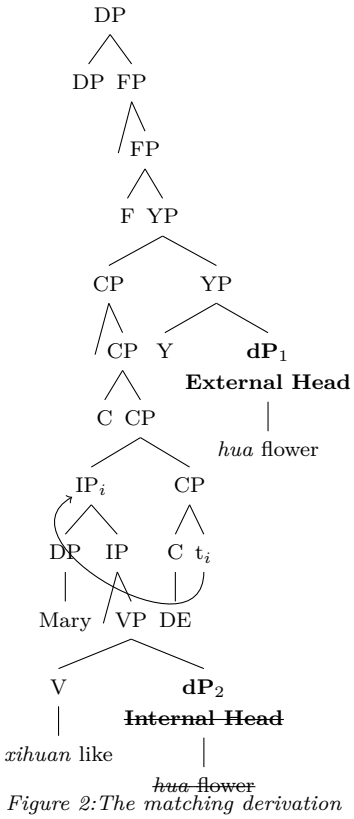


Figure 2:The matching derivation

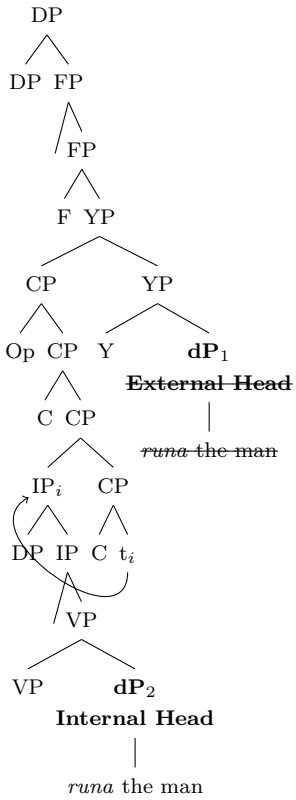
The example in (52) is the representation of externally Headed pre-nominal relative clauses in Mandarin Chinese (45). If it is derived from the *raising* operation (Figure 1), there are three steps to be followed. The internal Head (dP_2) *hua* 'flower' raises together with the IP to the lower Spec,CP firstly and then moves to the higher Spec,CP. In the higher Spec,CP, the internal head (dP_2) licenses the deletion of the external Head (dP_1) *hua* 'flower' after building the c-command relation. Subsequently, the remnant CP *Mary xihuan* 'Mary likes' moves outside of CP to make the relative clause precede the overt Head (dP_2) *hua* 'flower'. The case would be different in the *matching* case (Figure 2), where the overt Head is the external one (dP_1) *hua* 'flower' instead of the internal one dP_2. This derivation is less complex than that in *raising*, the internal Head (dP_2) *hua* 'flower' moves together with the IP to Spec, CP, where the external Head (dP_1) *hua* 'flower' makes the backwards deletion of it. Thus, the linear order of pre-nominal relative clauses is formed.

In this section, externally headed post-nominal and pre-nominal relative clausesboth involving an external Headhave been analyzed together in terms of their derivation. The next part moves to the case where the Head occupies an internal position within the relative clause.

Internally Headed Relative Clauses

Internally relative clauses represent a distinct type of relative construction where the head noun appears within the relative clause itself. In this case, there is no meaning in analyzing the linear order between the relative clause and its Head specifically. Under the *double-Headed* hypothesis, the derivation of internally Headed relative clauses (46) ,becomes clearer: the internal Head surfaces as the overt Head following the deletion of the external one (see (53)).

(53) [xwancha-q **runa** riku-sqa-n wasi-ta rura-n] 'the man that Juan saw builds a house'



As shown in (53), the internal Head (dP_2) *runa* 'the man' moves together with the IP to Spec, CP. In this configuration, the internal Head (dP_2) licenses the forward deletion of the external Head (dP_1) *runa* 'the man' under identity. Platero (1974) assumes that both backwards and forwards deletion under identity are viable operations, depending on the requirements of deriving externally Headed pre-nominal and internally Headed relative clauses. Also, a null operator Op is merged in Spec, CP to bind the internal Head as a variable. In this case, the derivation of internally Headed relative clauses naturally involves a full match between the internal and external Heads. The next part will explore the plausibility that internal and external Heads can co-occur within a single relative construction.

Double-Headed Relative Clauses

The presence of relative clauses exhibiting an overt double-Headed structure in certain languages and children's languages , supports the plausibility of the *double-Headed* structure as a universal underlying representation for all relative clauses. Cinque (2020) proposes that both the *raising* and *matching* approaches are are viable within his unified *double-Headed* hypothesis for generating relative constructions.

One type of double-Headed relative clause involves a head noun appearing within the relative clause as a copy of the external Head (the Head outside the relative clause is distinct from the *external Head* in the technical sense of the the *double-Headed* structure). Dryer et al. (2013)'s work confirms the appearance of such constructions, noting that they exhibit properties of both externally-Headed and internally-Headed relative clauses . These structures contain an overt noun both inside and outside the relative clause within a single configuration.

(54) a. [[**doü** adiyano-no] **doü**] deyalukhe (Kombai)
sago give.3PL.NONFUT-CONN sago finished.ADJ
'the sago that they gave is finished' (Dryer et al., 2013)

b. [[hemeti dete' **ge** hu-d-u-ma'] **ge**]... (Papuan)
today morning word say-PAST-1.SG-PIV word
'the word I spoke this morning...' (Renck et al., 1975)

The examples cited in (54) denote cases where the two overt Heads are exactly the same, supporting the hypothesis that the head noun within the relative clause is a full copy of the external Head. Under the *double-Headed* structure, both the *raising* derivation and full deletion under the *matching* derivation can account for this pattern. In such cases, the internal head noun may be viewed as a copy of either the internal Head or external Head as defined by the structure. Cinque (2011, 2020) argues that this derivational approach does not account for all instances of double-Headed structures across languages. He supposes that in some cases, the double-Headed structure may result from partial deletion under under the *matching* derivation. It means that this structure may undergo a partial deletion of the internal Head considering that the two Heads are not always the same. When the internal and external Heads differ in form or category, they fail to meet the conditions required for full Copy Deletion. Such a case is exemplified in(55).

(55) [[**ai** fali-khano] **ro**] nagu-n-ay-a (Kombai)
pig carry-go.3PL.NF thing our-TR-pig-PRED
'the pig they took away is ours'

It is evident that the two Heads *ai* 'pig' and *ro* 'thing' are distinct in (55), which blocks the possibility of assigning a copied one of the external Head to the position within the relative clause. In this case, Cinque (2020) suggests that this structure can be derived

from the *matching* operation, with only partial deletion of the internal Head. Under his analysis, the functional element within the internal Head has been deleted, while the core lexical noun remains. According to his hypothesis, the noun outside the relative clause is more general, whereas the internal noun refers to a more specific entity or vice versa. (56) denotes the application of the functional words.

(56) a. $[_{FP}[_{DP}$ guest] **person**]
b. $[_{FP}[_{DP}$ table] **thing**]

The examples above resemble structures like $[_{FP}[_{DP}$ New York] **person**], where the functional noun fails to be pronounced: *New York* instead of *New York City*. Review the example in (55), the internal Head *ai* 'pig' can be analyzed as $[_{FP}[_{DP}$ pig] **thing**] , while the more general external Head *ro* thing corresponds to $[FP[DP$ thing] **thing**]. In this configuration, the external Head can only delete the functional word *thing* in the internal Head , leaving the more lexical noun *ai* 'pig' overt.

To sum up, overt double-Headed relative clauses not only support the viability of a unified *double-Headed* structure across all types of relative clauses, but also illustrate the distinction between fully matching and partially matching derivations. The relative clauses shown in the following part reflect the opposite case where no overt Head appears in the structure, which are known as Headless relative clauses.

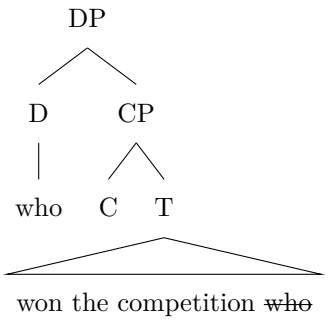
Headless Relative Clauses

C. Lehmann (1986) points out that Headless relative clauses represent a syntactic variation of Headed relative clauses, characterized by the absence of both internal and external Heads (see in (57)).

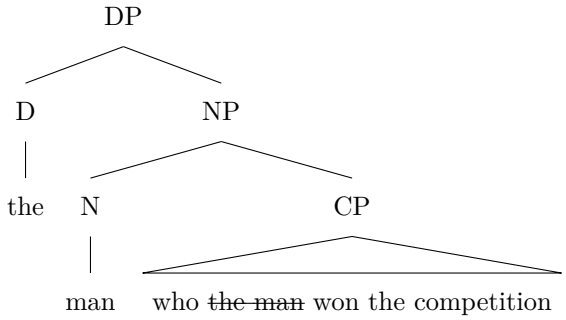
(57) a. The Headless relative clauses: I know who won the competition.
b. The Headed relative clauses: I know the **man** who won the competition.

Wh-pronouns play a crucial role in the derivation of Headless relative clauses. Donati and Cecchetto (2011) proposes that the wh-pronoun is external to the relative clause. In his analysis, the relativized item functions as a determiner in Headless relative clause, while it functions as a noun in Headed relative clauses.

(58) a.



b.

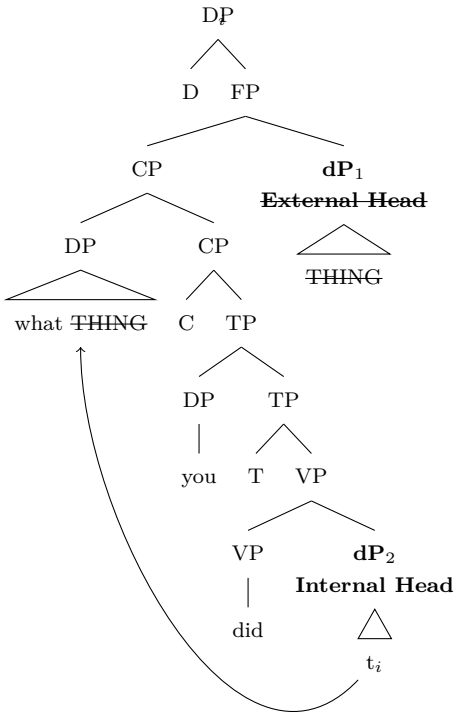


Following Donati and Cecchetto (2011)'s idea (58), the wh-pronoun *who* ought to be outside the CP. Similar proposals suggesting that wh-pronouns are in an external position within Headless relative clauses can also be found in Bury (2003), Citko (2006), and R. K. Larson (1998)'s works. However, Borsley (1984), Cinque (2020), Grosu and Landman (1998), and Kayne (1994) argue the opposite, maintaining that the wh-pronoun is internal to the relative clause. This view is supported by reconstruction effects observed in derivation and by the fact that extraposing the relative clause while stranding the wh-pronoun is not possible, both of which suggest that the wh-pronoun remains within the clause.

(59) * whatever books came out late I wanted to read. (Kayne, 1994)

The violation in (59) reflects the failure of relative clause stranding. The phrase *whatever books*, as the head of *I wanted to read*, is not available in this case. This phenomenon confirms the internal position of wh-phrases. Thus, within the framework of the *double-Headed* structure, Headless relative clauses are more plausibly derived by the *raising* operation, where the internal Head (wh-phrases) remains overt and the external Head is deleted.

(60) [**what** you did]



As shown in (60), the functional word *THING* originated in both the internal and external Heads. The internal Head additionally contains the wh-pronoun *what*, which raises to the Spec,CP position further. In this position, it licenses the deletion of the external Head *THING* under identity , leaving the wh-pronoun *what* within the CP. This derivation explains the lack of an overt head noun in Headless relative clauses under the *double-Headed* structure. The next part will illustrate another special type of relative construction , known as correlative clauses, in which both the main clause and the relative clause are explicitly marked, yet only a single overt head noun is present.

Correlative Relative Clauses

Dryer et al. (2013) classifies correlative relative clauses as a sub-type of internally Headed relative clauses due to the internal occurrence of the head noun in correlatives. The correlatives in Hindi (49) and the internal Headed relatives in Cuzco Quechua(46) have been repeated here as a comparison: (61) and (62)

(61) Correlative relative clauses

[$_{Rel}$ jo **laRkii** khaRii hai] vo lambii hai (Hindi)
REL girl standing is DEM tall is
'the girl who is standing is tall' (Srivastav, 1991a)

(62) Internally Headed relative clauses

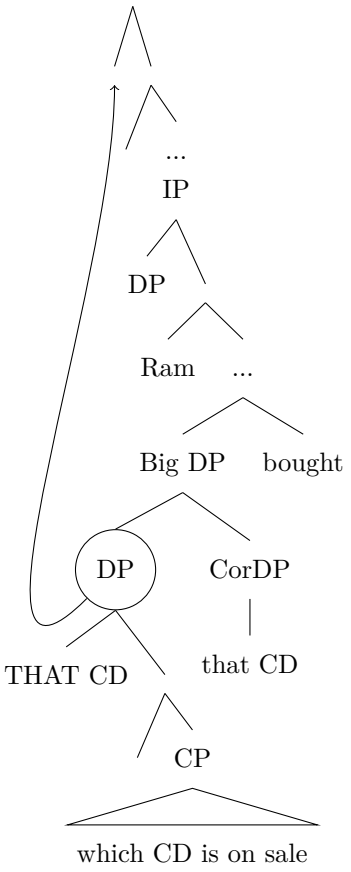
[$_{Rel}$ xwancha-q **runa** riku-sqa-n wasi-ta rura-n] (Cuzco Quechua)
Juan-GEN man-OBJ see-NML-3 house-ACC build-3
'the man that Juan saw builds a house' (Lefebvre & Muysken, 2012)

The most salient difference between the pair in (61) and (62) lies in the syntactic positioning of the relative clause. In (61), the relative clause appears externally, preceding the main clause and is linked to it via the anaphor *vo*. In contrast, in (62), the relative clause is embedded within the main clause itself. De Vries (2002) concludes the syntactic structure of correlatives as that in (63).

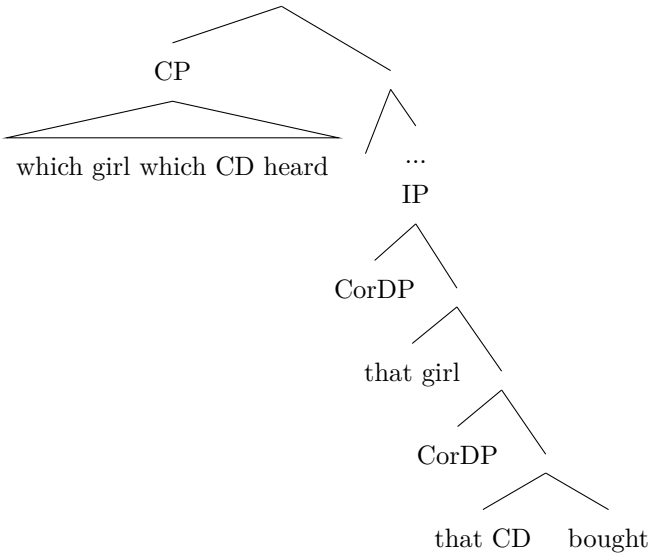
(63) $[_{matrix}[_{CP-correl}[_{DP-rel}$ wh NP$]_i$...t$_i$$][_{matrix}$...Dem...]

In De Vries (2002)'s hypothesis, correlatives are left-adjoined to the matrix clause. The correlate typically refer to a personal or demonstrative pronoun within the matrix, which builds a referring relation with the modified head noun. This idea can also be found in Lipták (2009) and Srivastav (1991b)'s work that the correlate DP in the matrix is bound by the relative clause (a bare CP) as a variable. However, a crucial point that is often overlooked is the existence of two types of correlative constructions: simple and complex. As noted by Izvorski (2000) , simple correlatives contain a single wh-phrase like that in (61) while complex correlatives contain multiple wh-elements, which would be explicitly illustrated in the following (64). Butt and King (2007), Cinque (2020), and Dayal (2012) propose that multiple correlatives ought to be excluded from the standard derivation of relative clauses. Cinque (2020) follows these analyses and further concludes that simple correlatives can be viewed as left dislocated DPs that contain a relative clause of one of the existing types (externally Headed post-nominal/pre-nominal, internally Headed, double-Headed, or Headless) and are resumed by an anaphoric DP in the matrix clause. In other words, the derivation of simple correlatives is not uniform but rather draws on the derivational strategies used in other types of relative constructions. As for multiple correlatives, it is more plausible to view them as free adjuncts or free relative clauses. The following (64) reflects the structure of such complex correlatives.

(64) a. Ram, which CD is on sale, that CD bought



b. which girl which CD heard, that girl that CD bought

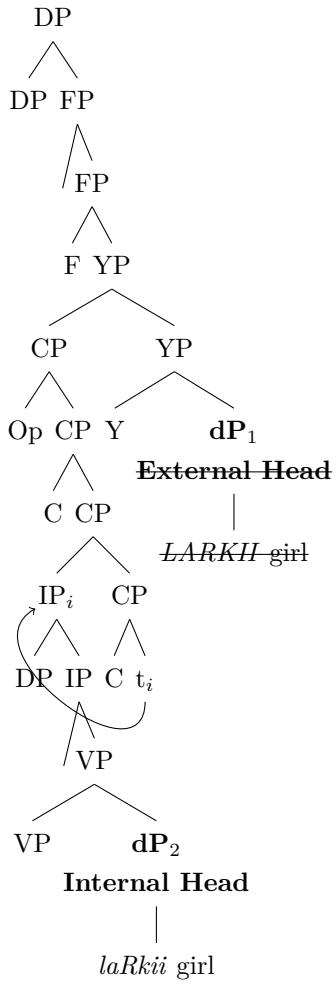


(64-a) and (64-b) reflect two cases of complex correlatives. In (64-a), the left-peripheral DP contains the relative CP *which CD is on sale* , which adjoins to the resumptive correlative DP *that CD*. This resumptive DP can strand in its movement to the left-periphery of the matrix IP. In (64-b), the CP *which girl which CD heard* is base-generated and obtains two wh-phrases. These two wh-phrases paired with the correlative anaphoric DPs *that girl* and *that CD* in the matrix clause. It is obvious that these complex correlative

relatives exhibit syntactic behavior similar to adjuncts or free relatives.

Cinque (2020) holds the view that it is highly possible to assume the existence of a silent external Head in simple correlatives under the *double-Headed structure* (see in (65)).

(65) [$_{DP}$ **VO LARKII**[$_{CP}$jo **laRkii** khaRii hai]] vo lambii hai
THAT GIRL REL **girl** standing is DEM tall is
'the girl who is standing is tall'



If the assumption that a silent external Head in simple correlatives is on the right track, the derivation of this relative construction can be like that in (65). Similar to the derivation of internally Headed relatives (seen in (53)), the silent external Head (dP$_1$) *LARKII* 'girl' undergoes deletion, licensed by the internal Head (dP$_2$) *LaRkii* 'girl' due to their same identity. Based on the analysis of correlatives, the next part will move to the case of adjoined relatives, which share certain similarities with correlatives.

Adjoined Relative Clauses

Hale (1976) labels the clause, which behaves both adverbial and relative functions, and which appears in a linear position discontinuously with the head noun it modifies, as the adjoined relative clause (the example of the adjoined relative in (50) is repeated here in

(66)).

(66) Adjoined relative clauses

ŋatulu-lu x-na **yankiri** pantu-nu [$_{Rel}$ kutja-lpa ŋapa ŋa-nu]
I-erg AUX emu supear-PAST C-PAST water drink-PAST
(Walpiri)

'I speared the emu which was drinking water' (Hale, 1976)

Evidently, the adjoined relatives do not build an overt resuming relation with the head noun *yankiri* 'emu' in the main clause in the case of (66). Concerning Hale (1976)'s analysis, some researchers argue that this type of clause seems to be a special representation of correlative relative clauses (Andrews, 2007; Dayal, 2012; Nordlinger, 2006). This implies the existence of a silent DP in the main clause, which resumes the adjoined relative clauses. Thus, the derivation of adjoined relative clauses is similar to that of correlatives. Moreover, Cinque (2020) holds the view that adjoined relative clauses encompass both the correlative configuration (seen in (67-a)) and the extraposition of externally Headed post-nominal relative clauses (seen in (67-b)).

(67) a. **yankiri-li kutja-lpa** ŋapa ŋa-nu, ŋula -na pantu-nu
emu-erg COMP-AUX water drink-past, that.one AUX spear-past
ŋatjulu-lu
I-erg
'the emu which was drinking water, that one I speared/while the emu was drinking water, then I speared it'

b. **yankiri-li kutja-lpa** ŋapa ŋa-nu, ŋatjulu-lu -na pantu-nu
emu-erg COMP-AUX water drink-past, I-erg AUX spear-past
'The emu which was drinking water, I speared it/While the emu was drinking water, I speared it' (Hale, 1976)

(67-a) reflects a case, where the anaphor *ŋula* 'that one' in the main clause resumes the externally Headed post-nominal relative clause *yankiri-li kutja-lpa ŋapa ŋa-nu* 'the emu which was drinking water' in a left dislocated position. Thus, Cinque (2020) makes the hypothesis that a silent anaphor exists in the main clause in (67-b). If this hypothesis is on the right track, it is highly plausible that the form of adjoined relative clauses in (66)((50)) appears to be derived from the extraposition of an externally Headed post-nominal relative clause and it has a silent DP noun in the main clause. Furthermore, Cinque (2020) suggests that the adjoined relative clause is naturally an externally Headed post-nominal relative clause, but its position is limited in peripheral positions. If the adjoined relative clause is to the left of the main clause, the correlative configuration is available. While, if it is to the right, the extraposition of the externally post-nominal relative clause is obvious. Thus, the analysis of adjoined relative clauses under the *double-Headed structure*

represents a synthesis of the derivational strategies used for both correlatives and post-nominal relative clauses. The choice of derivational approach depends on the position of the adjoined relative clause within the sentence.

The previous sections have categorized relative clauses according to syntactic typology. To be simple, there are two main types of relative clauses: Headed and Headless. Headed relative clauses can be further divided into externally Headed and internally Headed types, depending on whether the head noun is outside or inside the relative clause. Externally Headed relative clauses are further classified into pre-nominal (where the relative clause precedes the head noun) and post-nominal (where it follows), based on the linear order of the head noun and the relative clause. Internally Headed relative clauses are represented by constructions such as correlative clauseswhich include an overt internal head nounand adjoined relative clauseswhich involve a silent internal head noun. The existence of double-Headed relative clauses in some languages supports the plausibility of a unified *double-Headed structure* across relative clause types. Cinque (2020) gives a comprehensive and well-reasoned analysis of various relative clauses under the *double-Headed* approach. The semantic division of relative clauses will be shown in the following part to enhance the general understanding of relative constructions.

2.6.2 The Semantic Typology of Relative Clauses

From the perspective of semantic typology, relative clauses are typically divided into two main types: *restrictive* and *non-restrictive* relative clauses. While, Carlson (1977) introduces a third type-*amount* relative clauses, which is also called *maximalizing* relative clauses in Grosu and Landman (1998)'s work. Additionally, Prince (1997) recognizes the existence of *kind-defining* relative clauses, which has been further confirmed by Benincà and Cinque (2012). The following paragraphs will illustrate these semantic types of relative clauses specifically.

Restrictive and Non-Restrictive Relative Clauses

The distinction of restrictive and non-restrictive relative clauses reflects the differing informational contributions of the head noun and the relative clause to the overall meaning-information of the construction. To be specific, restrictive relative clauses are assumed to denote a set, which intersects with the set denoted by the head noun thus narrowing the reference. In contrast, non-restrictive relative clauses add extra information about a referent whose identity is already established (see in (68)).

(68) a. The students that failed the test on syntax. (restrictive relative clauses)
b. The students, who failed the test on syntax. (non-restrictive relative clauses)

In (68-a), the construction refers to the group of students who failed the test, without implying anything about those who passed. On the opposite, the information expressed by the example in (68-b) is that all students constitute the domain, and all of them failed the test. It is obvious that the restrictive one restricts the meaning of the head noun *the students*, whereas the non-restrictive specifies the meaning of the head noun. The following parts will focus on introducing two other special constructions, which are amount/maximalizing and kind-defining relative clauses.

Amount/Maximalizing Relative Clauses

Amount (or maximalizing) relative clauses are characterized by a unique interpretive pattern: although the head noun appears syntactically external to the relative clause, it is interpreted semantically within it. Sauerland (1998) argues that this phenomenon reflects a process of maximalization: a head noun with a numerical and a definite determiner is allowed to occur externally to the relative clause because its interpretation can be recovered from the meaning of the relative clause under the maximalization process. This distinctive relativization pattern was first identified in Carlson (1977)'s analysis of the interaction between relativization and *there*-insertion in English (see example (69)).

(69) a. I took with me the books (that) there were on the table.
b. I took with me the three books (that) there were on the table.

The reading of the sentence in (69-a) concerns the amount of books , rather than merely stating the existence of books on the table. In fact, the interpretation implies that I took with me all the books , illustrating that the head noun *books* plays its semantic function within the relative clause. Example (69-b) provides clear evidence of the maximalization effect: the head noun *books* has the specific number *three*. Consequently, the numeral three cannot serve to restrict the interpretation of the noun phrase books, since the NP has already been maximized within the relative clause. The sole role of three in this construction is to make the maximal interpretation explicit (here is *three*). As with other special constructions, kind-defining relative clauses have raised challenges in semantic interpretation, which will be reflected in the next part.

Kind-Defining Relative Clauses

Kind-defining relative clauses own specific semantics, which shares properties with non-restrictives.

(70) He's the kind of guy that (he) gets into a lot of fights. (Prince, 1997)

The sentence in (70) is a clear example of a kind-defining relative clause. In (70), the relative clause *that he gets into a lot of fights* can define neither the head noun *the kind*

of guy nor the whole complex NP *he's the kind of guy*. Rather, the reading of (70) is that some *he* has a property that allows him to get into a lot of fights. A suitable paraphrase of it can be *He's such that he gets into a lot of fights*. While the relative clause in (70) seems to add the extra information *gets into a lot of fights* to the head noun like the non-restrictive. However, it does not have a direct referential relation to the head noun *the kind of guy*. This kind of relative construction seems to predicate the property of an entity alone. Thus, McCawley (1981) classifies it as a pseudo-relative clause. Benincà and Cinque (2012) further characterize these clauses as contributing to the semantic classification of the head noun, without narrowing its referential scope.

This section has provided a typological overview of relative clause variation across both syntactic and semantic dimensions, and has assessed the plausibility of a unified *double-Headed structure* underlying all types. The following section will offer a more in-depth analysis of this *double-Headed structure*, aiming to summarize the various strategies employed in relativization.

2.7 Strategies of Relativization

The different relativizing operations in the *double-Headed structure*, whether in *raising* or *matching* cases, reflect the deletion relation between the internal Head and external Head. Under this structure, the indefiniteness of the external Head is confirmed, where it can only be a dP (smaller than a DP, lacking the determiner). In contrast, this restriction on indefiniteness does not apply to the internal Head. It means internal Heads can be a kind of DPs in some cases. Thus, the nature of various relativization strategies hinges on the size of internal Heads, which determines whether the relative clause involves full or partial deletion (with one head noun being deleted) under the *double-Headed* approach. To be specific, the relativization strategies can be viewed as a kind of relativization of internal Heads. Gaps, wh-pronouns, and resumptive pronouns naturally serves as the most common representations of internal Heads in relative clauses, each corresponding to different options within relativization strategies. Cinque (2020) identifies five main relativization strategies under his *double-Headed structure* : *the gap strategy*, *the resumptive pronoun strategy*, *the PRO strategy*, *the non-reduction strategy* and *the verb-coding strategy*. The following sections will specify these strategies.

2.7.1 The Gap Strategy

The gap strategy is actually composed of two cases: one with overt or silent invariant relativizers, and the other with relative pronouns.

Relative constructions are typically marked by a relative element. C. Lehmann (1986) argues that the most obvious function of a relative element is to denote the subordinate

status of the relative clause, which is commonly received by a designated pronoun or particle. In English, the relative elements serving this function include relative pronouns, relative particles, or nothing at all (seen in (71)).

(71) a. The student who/that/∅ we saw in the class.
b. The flower which/that/∅ we bought in the morning.

As seen in (71), the relative pronouns in English are wh-words, such as *who* (see (71-a)), *which* (see (71-b)), when, where, etc. Moreover, the relative particle is represented as a relative complementizer *that*. It is obvious that the morphology of *that* is invariant, regardless of whether it appears in relative clauses (71-a) or (71-b). In contrast, the wh-pronouns exhibit morphological variation, which depends on the properties of the head nouns. In (71-a), the head noun *student* has the *HUMAN* property, which requires the wh-pronoun *who*. Suppose the head noun is changed to *flower* like that in (71-b), *who* needs to be changed into *which* to denote the *NON-HUMAN* property. The condition for the accessibility of ∅ in constructions like that in (71) is that the relativized elements (the head nouns) *student* and *flower* in the internal position within the relative clauses are not the subjects. The examples in (71) demonstrate that the invariant relativizer *that* can be a free alternative to the wh-pronouns *which/who*. However, it is not always the truth. In some cases, the wh-pronouns are obligatory and cannot be replaced by invariant relativizers (seen in (72)).

(72) The day when/*that/*∅ you arrive the school.

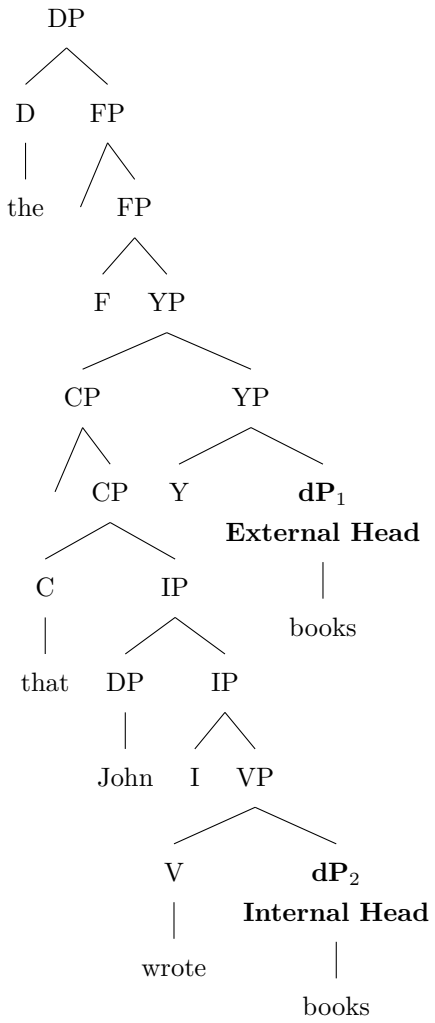
Due to the distinct properties of invariant relativizers and relative pronouns in relative clauses, the choice between these two relative elements reflects a division in relativization strategies. A detailed discussion is shown in the following section.

The Gap Strategy with Overt or Silent Invariant Relativizers

This kind of gap strategy reflects the non-distinctness of the external and internal Heads, meaning that either can be deleted fully during relativization. The example in (51) analyzed before, serves as the clearest illustration of this strategy and is repeated here in (73).

(73) a. The **books** that/*∅ John wrote [~~**books**~~].

b.

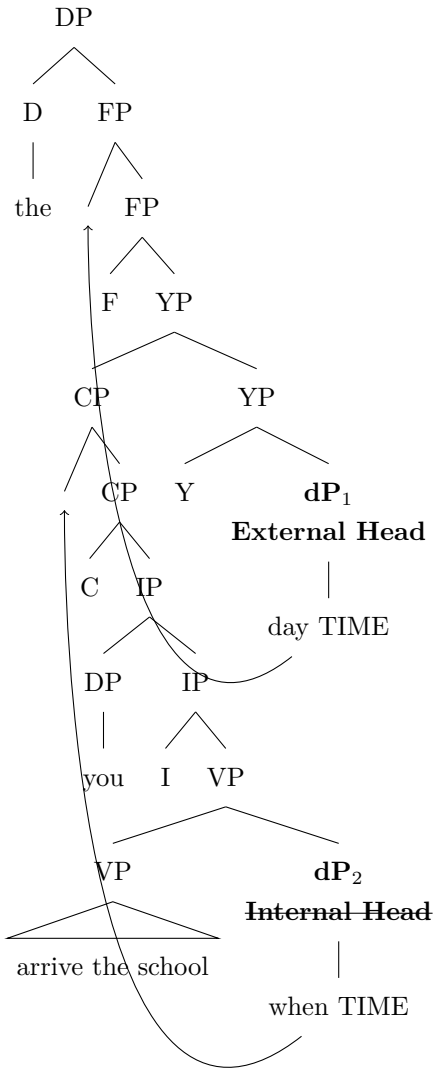


In (73), the external Head *books* and the internal Head *books* show no distinctness. Thus, if it is derived from the *raising* operation, the internal Head deletes the external one fully and raises to Spec,CP. If this sentence has individual reading, the *matching* analysis is applied where the external Head deletes the internal Head fully and moves to Spec, FP. In both cases, the internal Head leaves a gap in its original, , as it is of the same size as the external one. However, if a relative pronoun appears in the gap strategy, it suggests a partial matching between the two Heads, which will be analyzed in the following part.

The Gap Strategy with Relative Pronouns

The gap strategy involving relative pronouns represents a case where the size of the internal Head is bigger than the external one. The relative pronoun is obligatory here and cannot be replaced by an invariant relativizer freely. In this case, the external Head is still a dP, but the internal one is a kind of DP. This structural asymmetry between the two Heads renders full deletion of the internal Head impossible. In this case, the wh-pronoun surfaces as the remnant of the internal Head and establishes a binding relation after raising to Spec,CP (see the derivation of (72) in (74))

(74) The day TIME [when TIME$_i$ you arrive the school t$_i$].



The derivation in (74) closely resembles that of Headless relative clauses discussed previously (compare the derivation in (60)), where Cinque (2020) admits the plausibility of functional words in head nouns help avoid postulating phrases like *when day* in (74). If this is on the right track, the functional word *TIME* exists in both the internal and external Heads. However, the internal and external heads differ in composition, as the wh-pronoun *when* is within the internal one , while the lexical word *time* appears in the external Head. Reviewing that the internal Head needs to delete the external one in the *raising* derivation of the *double-Headed structure*, which requires the two Heads to be exactly the same. The failure of exact matching between the two Heads in (74) makes the *raising* derivation impossible under this structure. Thus, the gap strategy with wh-pronouns is only available within the *matching* derivation. This distinction causes the overt Head (the external Head) to license the deletion of the functional word *TIME* within

the internal Head. Thus, the wh-pronoun *when* remains in this relativization strategy. Moreover, a trace is left in the original position of the internal Head due to the movement of *when* within the CP.

In all, the gap strategy covers both fully and partial matching of the two Heads. The former involves overt or silent invariant relativizers, while the latter pertains to cases with relative pronouns. The following section will explore another case of partial matching between the two heads, known as the resumptive pronoun strategy.

2.7.2 The Resumptive Pronoun Strategy

The resumptive pronoun itself presents a complex issue, appearing across a wide range of constructions involving A' dependencies like relative clauses, wh-questions, across-the-board (ATB), and so on. However, this section does not aim to provide an in-depth analysis of resumptive pronouns. Instead, a dedicated chapter will be reserved for a deeper exploration of their unique properties in relativization. This section generalizes the resumptive pronoun as one way of relativizing the internal Head, contributing to the overall classification of relativization strategies under the *double-Headed structure*.

The optionality of resumptive pronouns in relativization complicates their analysis within the *double-Headed structure*. In some cases, resumptive pronouns seems to be obligatory to rescue violations of syntactic constraints, however, it does not preclude the possibility that a gap may freely alternate with the resumptive pronoun.

(75) a. the guy$_i$ who I hate almost everything *(he$_i$) does. (Colloquial English) (Kayne, 1981)

b. ha-simla$_i$ Se kaniti (ota$_i$) hayta yekara. (Hebrew)
the-dress Op I-brought it was expensive
'the dress I bought was expensive' (Sharvit, 1999)

The two examples in (75) form a comparison pair, where the resumptive pronoun is essential in (75-a) but optional in (75-b). In both cases, the resumptive pronouns occur within the relative clauses, marking their presence as a strategy for relativizing the internal Heads. Based on the traditional analyses of relativization (the *raising* and *matching* analysis introduced in the previous section instead of the *raising* and *matching* derivation under Cinque's *double-Headed structure*), the derivational status of resumptive pronouns has prompted considerable debate. As analyzed previously, once the resumptive pronoun derives from a *raising* operation, it ought to display movement properties like sensitivity to islands, reconstruction effects, and idiom chunks. If it is caused by a *matching* derivation, it shows the opposite situation. Bassi and Rasin (2018) holds the view that optional resumptive pronouns appear to be formed by the *matching* derivation, which blocks reconstruction, whereas obligatory resumptives arise via *raising* , thereby permit-

ting full reconstruction. To some degree, the *double-Headed* structure appears to make the derivation of resumptive pronouns much more specific. The existence of resumptive pronouns within relative clauses indicates that the internal Head is bigger than the external one. When the exact matching between two Heads cannot be reached, the only available derivation under the *double-Headed structure* is the *matching* strategy. If resumptive pronouns show reconstruction effects, it means they have undergone internal movement within the relative clauses. On the other hand, some argue that resumptive pronouns are base-generated in situ, occupying the internal Head position without undergoing movement. A more detailed examination of resumptive pronouns in relativization will go further in a later chapter. The next part moves to an analysis of the PRO strategy, another instance of partial matching between internal and external Heads.

2.7.3 The PRO Strategy

The case where the internal Head is represented by a PRO can also be regarded as a form of non-fully matching under the *double-Headed structure*. A typical instantiation of this strategy is found in reduced participial relative clauses. Relative clauses with present or past participles are commonly concluded as reduced forms, primarily due to the lack of a CP layer in their syntactic structure. Cecchetto and Caterina (2020), Cinque (2020), Siloni (1995), and Williams (1975) summarize the properties of participial relatives as the following:

(76) a. Lacking relative elements (relative pronouns or relative complementizers);
b. Lacking overt subjects;
c. Lacking the tense;

Krause (2001) holds the view that participial relative clauses can be classified into two primary types: subject relativization and non-subject relativization (see these two types in (77) and (78)).

(77) the two professors [PRO recently appointed]. (Cinque, 2010)

(78) [Meltem-in gör-dü-ü] ylan. (Turkish)
Meltem-G see-DIK-3poss snake
'the snake that Meltem saw' (Krause, 2001)

The case in (77) illustrates subject relativization, characterized by the absence of a nominal subject within the relative clause. (78) is a special case, where the object composition *ylan* 'snack' is relativized, and the subject *Meltem* receives genitive Case. Obviously, both these two examples lack a nominative Case in Spec, IP. Following Kayne (1994)'s idea, this phenomenon is attributed to the absence of a finite tense. Two analytical directions have been proposed to account for this: one involves the participial *gör* 'see' with the suf-

fix -DIK in (78), which licenses a genitive DP in subject position; the other, exemplified in (77), requires the insertion of a PRO in the subject position when such verbal morphology is absent. (77) denotes the PRO strategy in relativization, where the internal Head cannot be the same as the external one due to the lack of nominal Case assignment within the relative clause. The next part focuses on constructions where the head nouns are not deleted. This absence of deletion is interpreted as the manifestation of the non-reduction strategy in relativization.

2.7.4 The Non-Reduction Strategy

Under the *double-Headed structure*, the non-reduction strategy denotes relative clause in which both the internal and external Heads are overtly realized. As discussed before, such structures can be derived from the case where the head noun inside the relative clause is the copy of the external one or the case where the internal Head is partially deleted under the *matching* derivation.

Cinque (2020)'s definition of the non-reduction strategy (shown above) in relative constructions is different from the traditional non-reduction strategy defined in Comrie (1989)'s work. In Comrie (1989)'s idea, the non-reduction strategy applies to three distinct types of relative clauses (shown in (79)).

(79) Comrie (1989)'s definition of the non-reduction strategy in relativization

a. correlatives: the head noun within the relative clause is a full-fledged noun phrase that can be resumed again by a pronominal or a non-pronominal element in the main clause
b. internally headed relative clauses: the head noun is represented by a noun phrase within the relative clause and does not appear overtly in the main clause
c. paratactic relative clause: similar to the correlatives but lacking the wh-element as a modifier of the head noun within the relative clause (Cinque (2020) concludes this type as a subtype of correlatives)

Cinque (2020)'s non-reduction strategy is set for concluding various ways of relativizing internal Heads. Thus, it refers to the non-reduction of head nouns, which can only be applied to relative clauses with two overt Heads. The strategies of relativization also perform on the verb formation, which will be illustrated in the following section.

2.7.5 The Verb-Coding Strategy

Despite the gap with invariant relativizers (individual reading)/relative pronouns, the resumptive pronoun, the PRO and non-reduction strategies, the verb-coding strategy

introduced here is the other one which also reflects the partial matching case of the two Heads (the internal Head is bigger than the external one) under the *double-Headed structure*.

Keenan (1972) points out that noun-coding and verb-coding as two strategies for indicating the syntactic function of relativized noun phrases. The verb-coding strategy applied in relativization refers to cases where the syntactic function of relativized noun phrases is denoted by the morphology of verbs instead of nominal elements like relative and personal pronouns. Moreover, Schwartz (1988) believes that the presence of a verb-coding construction requires its verb-coded argument to be null. According to this rule, relative clauses taking the verb-coding strategy typically exhibit the absence of an overt head noun within the relative clause (seen in (80)).

(80) a. asu [si-usu iraono]
dog REL.SBJ-bite child
'the dog which bit the child...'

b. si'ila [ni-be nama Dali kefe]
village.advisor REL.OBJ-give father.MUT Dali money
'the village advisor to whom Dali's father gave the money...' (Cinque, 2020; Comrie, 2003)

The above examples are from Nias (Western Malayo-Polynesian language). (80-a) is the case where the subject *asu* 'dog' is relativized, while (80-b) denotes the relativization of the object item *si'ila* 'village advisor'. To make a distinction among different syntactic functions of relativized items, the affix *si* is added to the verb *usu* 'bite' to mark the subject in (80-a) and the verb *be* 'give' is attached with the affix *ni* to denote the object in (80-b). Obviously, no verb-coded arguments appear in either example, which aligns with the condition set for verb-coding constructions: the relevant argument must be null.

To sum up, the distinction or non-distinction between the two Heads directly decides the option of relativization strategies. A prerequisite for the *raising* derivation under the *double-Headed structure* is that the internal Head shares the same size as the external one, thereby permitting the full deletion of the external Head. In this case, the internal Head is the overt Head and leaves a gap in its original position due to its upward movement to Spec,CP. Apart from that, all cases are derived from the *matching* operation. Resumptive pronouns, PRO, overt double Heads (non-reduction), and verb affixes (verb-coding) are the remnants of the internal Head following partial deletion licensed by the external Head. Also, since movement of the internal Head within the relative clause is is permitted under *matching*, gaps may also result from this analysis. It is obvious that *the double-Headed structure* overcomes several constraints posed by traditional analyses of relativization. Through its application, a unified account of various types of relative constructions becomes attainable. The following section will explain another novel hypothesis

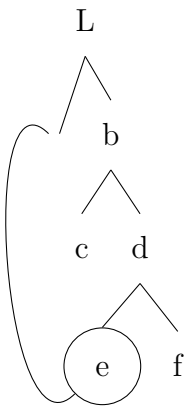
of relativization, which is the *multi-dominance*.

2.8 The Multi-Dominance Theory in Relativization

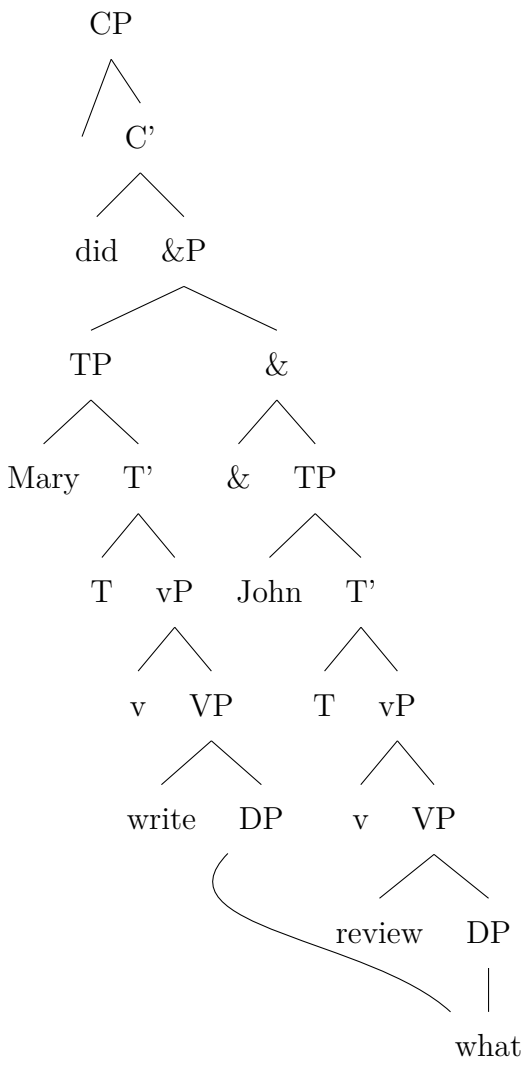
Similar to the single *double-Headed structure* proposed by Cinque (2020), the *multi-dominance* theory also challenges traditional analyses of relative clauses. Within this framework, a single node is permitted to have two mothers. Applying it to relativization, this theory proposes that the relativized noun is likely to play its function at two different positions.

The multi-rooted structure is created by the multi-dominance theory, which is illustrated in (81) and (82).

(81)

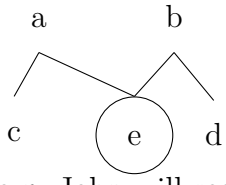


e.g. what did Mary write and John review?

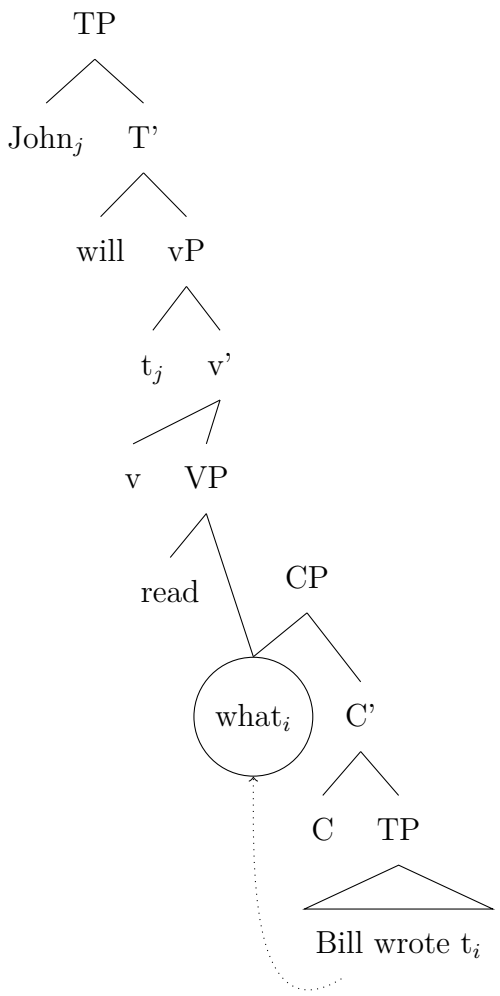


In (81), the wh-pronoun *what* is shared in the coordinated VP structure [$_{VP}$ write [$_{DP}$ what]] and [$_{VP}$ review [$_{DP}$ what]]. While, (82) reflects the other case in the multi-rooted structure.

(82)



e.g. John will read what Bill wrote.

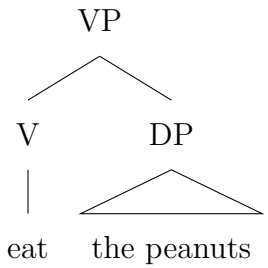


Different from that in (81), the wh-pronoun *what* in (82) is shared in the subordinated structure [$_{VP}$ read what ...[$_{TP}$ Bill wrote what]]. To realize the multi-rooted structure, *what* requires to raise to Spec,CP position where is able to be dominated by its other mother node *read*.

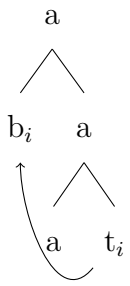
Multidominant structures are compatible with current minimalist assumptions about phrase structure and movement. Chomsky (2001) makes the distinction between two kinds of Merge: External Merge (seen in (83)) and Internal Merge (seen in (84)). External Merge takes two syntactic objects and forms one larger object from them, while Internal Merge differs from External Merge only in that one of these two objects is a sub-part of the other.

(83)

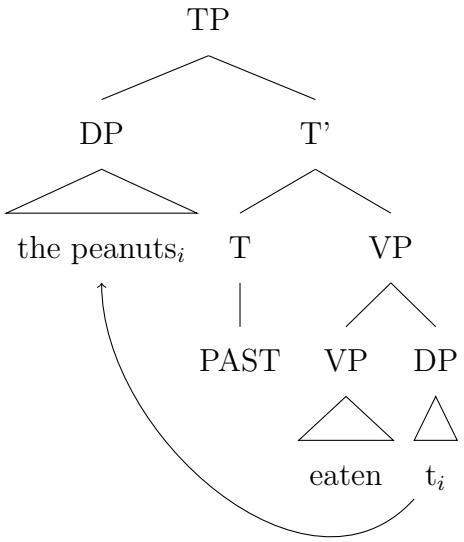
e.g. eat the peanuts



(84)



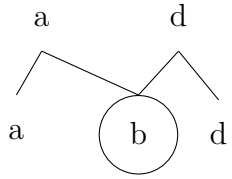
e.g. the peanuts were eaten



Following Chomsky (2001)'s idea, Citko (2005) predicates the existence of a third type of Merge, combining properties of External Merge and Internal Merge. This one is Parallel Merge, which is responsible for generating multidominant structures. Parallel Merge structures are the result of a two-step process. First, a merges with b (85-a) like that External Merge. Then, two distinct rooted objects (a and d) are combined by taking a subpart of one of them (b). (85-b), which is similar to Internal Merge. As a result, b is shared between a and d.

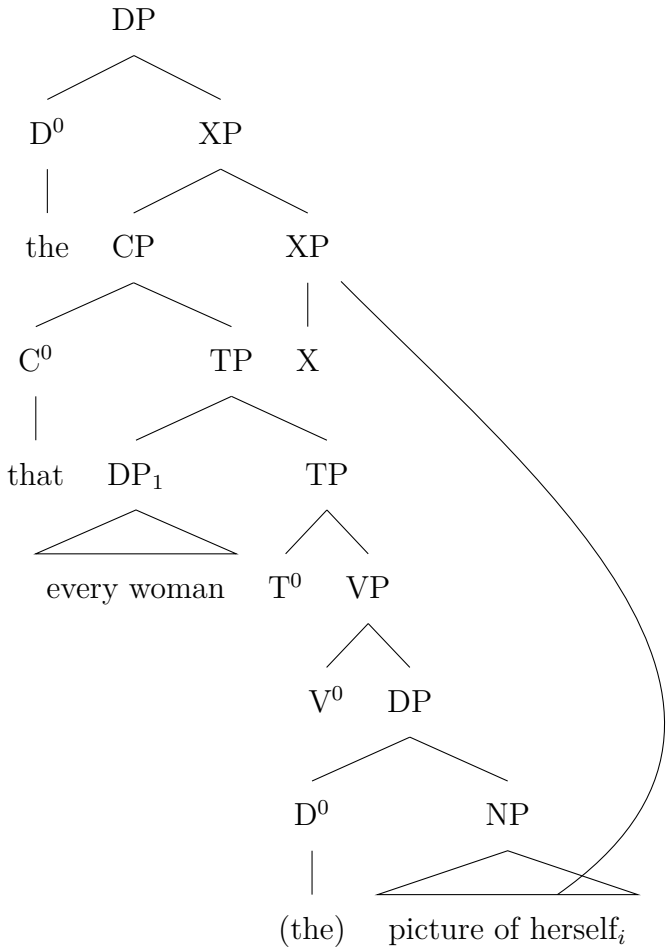
(85) a.

b.



If the idea that movement is a form of Internal Merge is taken literally, then all cases of movement inherently result in multidominant structures. Based on this, an illustrative example of relativization under the multi-dominance approach is given in (86).

(86) e.g. The picture of herself$_i$ that every woman$_i$ is admiring.



(86) shows its plausibility. The contrast in (87) shows that the quantifier *evey woman* must c-command the lower position in the relative clause movement. This suggests that the NP part of a relative clause *picture of herself* is semantically interpreted in both positions. Therefore, any variables it contains must be bound from the same thing in both positions.

This indicates the presence of parallel merge in relative clauses, as illustrated in (86).

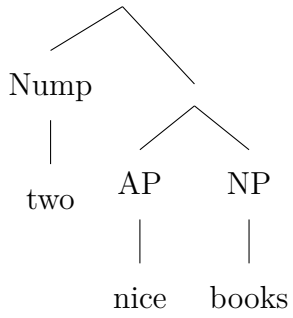
(87) a. The picture of herself that every woman is admiring.
b. *The picture of herself that every woman's father is admiring.

To some degree, the *multi-dominance* theory proves the possibility of Cinque (2020)'s *double-Headed* structure. Like the *double-Headed* structure, the *multi-dominance* theory predicts that the relativized noun is merged in both a higher and a lower position. In the *multi-dominance* framework, the relativized item merges at two positions via Parallel Merge, while in the *double-Headed* structure, two distinct heads are merged at separate positions (with the external head in the higher position and the internal head in the lower one). Building on the concepts of the *double-Headed* structure and the *multi-dominance* approach, the next section introduces the core idea of this thesis: how these two approaches are combined in the analysis of relativization.

2.9 Combing the *Double-Headed* Structure and the *Multi-Dominance* approach

In Cinque (2020)'s *double-Headed* structure, the two head nouns play an essential role in relativization. The composition of these two nouns is illustrated in (88) and (89) (adapted from examples (42) and (43)).

(88) The two nice books that John wrote.
dP_2/dP_1 (internal head/external head)



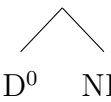
(89) The time when he left.
dP_2 (internal head) dP_1 (external head)

Based on the previous discussion, the internal and external head nouns are defined as dPs, smaller than DP but larger than NP, which can host extra information such as multal/paucal quantifier, cardinal (and possibly ordinal) numerals, APs, overt/silent in-

definite determiner (between the cardinal numerals and adjectives). Example (88) reflect the *raising* and *fully matching* cases under the *double-Headed* structure, where the two head nouns share an identical structure. In the raising case, the internal head is fully deleted under identity with the external head, while in the matching case, it is the external head that is deleted. Example (89) illustrates a situation where the external head and internal heads are categorically distinct, one is *time* and the other is *TIME*, which resulting in only partial matching and leaving the wh-pronoun *when* in relativization. In both cases, the internal structures of the internal and external heads appear largely parallel, creating challenges for determining their precise sizes and for analyzing the formation of wh-pronouns. To address this issue, the *multi-dominance* approach is adopted here.

Under the *multi-dominance* approach, a single element (NP) plays its functions in two positions, forming a multi-rooted structure for relative clauses. By combining the *multi-dominance* approach with Cinque (2020)'s *double-Headed* structure, it is plauible to assume that the internal head consists of D^0 and NP, whereas the external head is realized as a NP. This configuration is illustrated in (90).

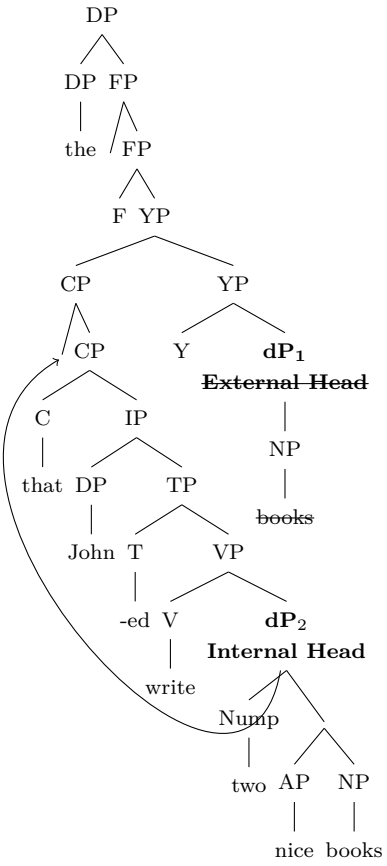
(90) a. DP (internal head)



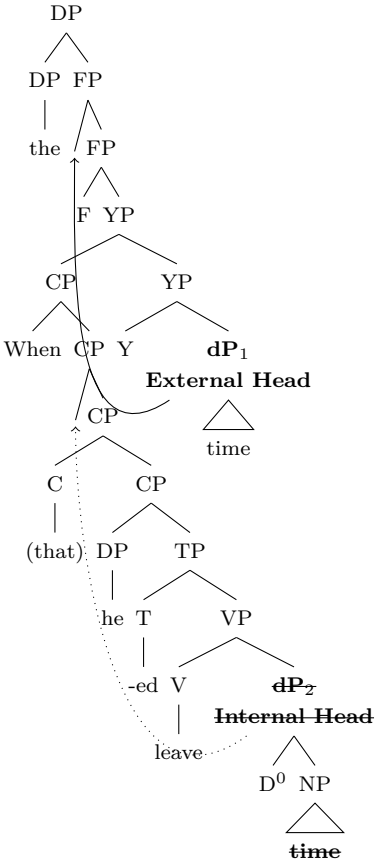
b. NP (external head)

Unlike the head nouns defined in the *double-Headed* structure, which are assumed to share an identical internal structure, (90) makes a structural distinction between the external and internal head nouns. The derivations of (42) and (43) under this combined approach are provided in (91) and (92), respectively.

(91) The two nice books that John wrote.



(92) The time when he left.



As illustrated above, this combined approach provides a clear structural distinction between the external and internal head nouns. In the raising case (91), the NP books within the internal head fully deletes the external head NP books and subsequently raises to Spec,CP. In contrast, (92) demonstrates the partial deletion observed under the matching approach, where the external head noun cannot fully delete the internal head, leaving behind the D^0 element of the internal head. This remnant D^0 then moves to Spec,CP, accounting for the formation of wh-pronouns.

Overall, this combined approach offers a more precise explanation for the derivation of partial matching cases, and it will be further applied in the analysis of resumption in chapter 5.

2.10 Conclusion

In this chapter, a general analysis of relative clauses has been sketched out. Initially, a definition combining syntax and semantics theory was taken to characterize relative constructions. Then, several influential approaches to deriving relative clauses have been introduced. The oldest *D-complement* and *standard* theories have gradually been abandoned due to their limitations in reflecting the relation between the head noun and the relative clause. The popular *raising* and *matching* analysis have gained empirical support. For example, phenomena such as reconstruction effects reconstruction, idiom chunk interpretation, and scope assignment favor the *raising* analysis. Meanwhile, the *matching* analysis offers compelling explanations for case mismatches, the license of negative polarity items, and the violation of Principle C. These facts support the co-existence of the *raising* and *matching* analyses in the derivation of relative clauses, with the choice between them being determined by specific syntactic and semantic contexts..

After introducing existing analyzing approaches, Cinque (2020)'s *double-Headed structure* has been illustrated. In his hypothesis, all relative clauses have two Heads (internal one and external one), and the various relative constructions are caused by the difference in deleting these Heads (internal or external). The deletion of the external Head corresponds to the *raising* derivation, while the deletion of the internal Head is consistent with the *matching* derivation. This unified structure not only accounts for the derivation of all types of relative clauses but also explains the existence of wh-pronouns, resumptive pronouns, dual overt head nouns, and gaps, all of which arise from the distinctness or non-distinctness between the external and internal Heads. The multi-dominance theory admits the multi-rooted structure in relative clauses, which also proposes two merging positions for the relativized head noun like that in the *double-Headed* structure. However, the key distinction is that in the multi-rooted structure, the same element is merged into two positions.

In conclusion, whether under the *double-headed structure* or the *multi-rooted struc-*

ture of the multi-dominance theory, both frameworks challenge traditional analyzing approaches and build a unified structure for all relative clauses. In my thesis, I combine these two analyzing approaches with the aim of clarifying the structural composition of head nouns. The next chapter will move to the analysis of Mandarin Chinese relative clauses to explore their properties and how the proposed structure accounts for their unique relative constructions.

Chapter 3

Relative Constructions in Mandarin Chinese

3.1 Introduction

The previous chapter outlines a basic picture of relative constructions cross-linguistically, categorizing relative clauses into different types according to their syntactic and semantic typology. Moreover, it highlights the advantages of Cinque (2020)'s *double-Headed* hypothesis in the analysis of relative clauses by comparing it with other existing approaches like the *raising* and *matching* approaches. The application of the *multi-dominance* theory in relativization further supports the *double-Headed* structure.

The analysis of Mandarin Chinese relative clauses has sparked significant debate due to its specialties in typology, relative elements, and relativizing strategies. This chapter aims to apply Cinque (2020)'s *double-Headed* structure to the analysis of Mandarin Chinese relative clauses. On one hand, this application helps assess the plausibility of *double-Headed* structure, which ought to be available in all special forms of relative constructions. On the other hand, it would be an excellent way to unify the properties of relative clauses in Mandarin Chinese.

This chapter begins with fundamental studies on Mandarin Chinese, focusing on its word order and NP structure. These two aspects are closely linked to relativization in Mandarin Chinese. Then, this chapter moves to two main sections: the special structure of Mandarin Chinese relative clauses and the specific analyses found in the literature. The former examines the properties of Mandarin Chinese relative clauses, including the relative elements, their syntactic and semantic types, the positions of relativization, and the relativization strategies. The latter summarizes four approaches to analyzing Mandarin Chinese relative clauses: the operator movement, the raising approach, the matching approach, and the mixed approach. Last but not least, I doubt Cinque (2020)'s idea of Mandarin Chinese relative clauses, which regards them as a form of participial/non-finite

relative clauses due to their similarities to English participial relatives. In my proposal, Mandarin Chinese relative clauses are naturally a regular form of relative constructions with distinct properties.

3.2 Fundamental Aspects of Mandarin Chinese Syntax

This section summarizes the specific views on the syntax of Mandarin Chinese, which is significant to the analysis of relative constructions.

3.2.1 Word Order in Mandarin Chinese

The discussion of word order in Mandarin Chinese has raised a lot of disputes. C. N. Li and Thompson (1974, 1989) and Tai (1973) makes the claim that Mandarin Chinese is an SOV (Subject-Object-Verb) language. However, Chu (1979), Mulder and Sybesma (1992), and Whitman and Paul (2005)suggests that the basic word order tracked in Mandarin Chinese is SVO and there are no sufficient arguments made for the SOV order. C.-T. J. Huang (1998) holds the view that Mandarin Chinese appears to be head-initial in VP but head-final in NP, which challenges the analysis of basic word order in Mandarin Chinese. In this brief introduction, I follow the idea that Mandarin Chinese is an SVO language without providing further evidence from these studies.

(1) a. Lisi [$_{VP}$ **xihuan** [$_{NP}$ hua]]
Lisi like flower
'Lisi likes flowers'

b. Lisi [$_{ModP}$ **keneng** [$_{VP}$ xihuan hua]]
Lisi may like flower
'Lisi may like flowers'

c. Lisi [$_{AspP}$ mai$_i$-le [$_{VP}$ t$_i$ na-duo hua]]
Lisi buy-PERF that-CL flower
'Lisi has bought that flower'

As shown in (1), the VP and its extended functional projections ModP and AspP are head-initial. In (1-a), the verb *xihuan* 'like' takes the complement *hua* 'flower' post-verbally. In (1-b), the modal *keneng* 'may' takes VP as its complement to the right. In (1-c), the verb *mai* 'buy' moves from the position within VP to AspP, which suggests that AspP is also head-initial. The NPs in Mandarin Chinese reflects the opposite which strictly follows the head-final rule. In this case, all phrases occupies the left positions to head nominals within nominal phrases. Seen the following (2):

(2) a. $[_{NP}[_{NP}$ laoshi de] xuesheng]
teacher DE student
'teacher's student'

b. $[_{NP}[_{AP}$ congming de] xuesheng]
smart DE student
'smart student'

c. $[_{NP}[_{CP}$ zuotian lai de] xuesheng]
yesterday come DE student
'the student who came yesterday'

d. $[_{NP}[_{PP}$ dui lunwen de] yijian]
of dissertation DE criticism
'the advice of the dissertation'

It is obvious that NP, AP, CP, PP in (2) appear prenominally. These prenominal phrases are linked with the head nominal through the particle *de*. [1] According to this phenomenon, C.-T. J. Huang (1998) propose the following X-bar schema for Mandarin Chinese (seen in (3)).

(3) X-bar schema for Mandarin Chinese

a. $[x^n\ X^{n-1}\ YP^*]$ if and only if n=1 and X$\neq$ N

b. $[x^n\ YP^*\ X^{n-1}]$ otherwise

Example (3-a) suggests that N does not branch to the left in the lowest expansion. Instead, N is strictly head-final, meaning the head branches to the right in both the final and non-final expansions. In contrast, for all other categories, the head branches to the left in the final expansion and to the right in the non-final expansion. To be concluded, except for N, all X' categories are head-initial in Mandarin Chinese.

Moreover, a demonstrative and a 'numeral-classifier' also appear in prenominal positions which is shown in (4):

(4) na shi-wei laoshi de xuesheng
that ten-CL teacher DE student
'those ten teacher's student

The next part will focus on analyzing the specific NP structure in Mandarin Chinese.

3.2.2 Mandarin Chinese NP structure

The relative clauses function as modifiers of a noun within an NP, providing additional information about the noun. In this case, the structure of nominals in Mandarin Chinese is the base for relative constructions in Mandarin Chinese.

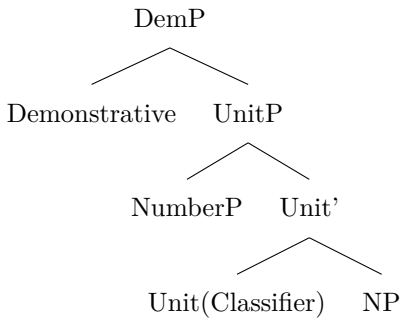
[1] The detailed discussion of *de* in relative constructions will be shown latter.

Following the DP hypothesis of Abney (1987), it generally assumes the sequence of article noun in languages like English to be a head-complement structure (i.e.,(5-a)) instead of the traditional noun phrase structure that shows a specifier-head relation (i.e.,(5-b)).

(5) a. $[_{DP}$ a $[_{NP}$ house]]
b. $[_{NP}$ a $[_{NP}$ house]]

This DP analysis triggers the further consideration whether article-less languages exhibit functional layers above NP. Mandarin Chinese is the representation for article-less languages. Boskovic (2008) suggests that article-less languages have no DPs. Hsu (2012) analyzes the internal structure of nominal expressions in Mandarin Chinese and argues that they involve structures larger than a noun phrase, which are Demonstrative Phrase and Unit Phrase. This internal structure is illustrated in the following (6):

(6)



In (6), the Unit Phrase is headed by a classifier with the Number Phrase being at its specifier. The Demonstrative Phrase is headed by a demonstrative. This structure bases on the fact that Mandarin Chinese nominal expressions follows the fixed order *Demonstrative, Number-Classifier, Noun.* Seen in (7):

(7) a. Dem Num-CL N
na san-duo hua
that three-CL flower
'those three flowers'
b. ∗ na hua san-duo
c. ∗ san-duo na hua
d. ∗ san-duo hua na
e. ∗ hua na san-duo
f. ∗ hua san-duo na

Moreover, Hsu (2012)'s proposal is supported by the facts that numbers cannot alone surface inside of a nominal but other head elements can. The contrast is shown in (8):

(8) a. wo jian-guo **na hua**
I see-EXP that flower
'I have seen that flower'

b. wo jian-guo **duo hua**
I see-EXP CL flower
'I have seen a flower'

c. wo jian-guo **hua**
I see-EXP flower
'I have seen a flower/flowers

d. ∗ wo jian-guo **san hua**
I see-EXP three flower
'I have seen three flowers'

e. ∗ wo jian-guo **na san hua**
I see-EXP that three flower
I have seen those three flowers

f. wo jian-guo **na san-duo hua**
I see-EXP that three-CL flower
'I have seen those three flowers'

The contrast between (8-a)(8-c) and (8-d)(8-e) proves that a Number Phrase is not able to dominate classifier and noun. Moreover, (8-e) and (8-f) reflects that the number requires to come with the classifier. As shown in this proposed structure, Mandarin Chinese only allows prenominal modifiers. It confirms with the fact that Mandarin Chinese only allows relative clauses to be prenominal.

It is important to note that this proposed structure also confirms that the DemP is responsible for definiteness and referentiality, while the UnitP defines the measurement of noun in Mandarin Chinese. C. J. Huang et al. (2018) and Tang (1990) suggests that number is often analyzed as the head of number phrase, either dominating the classifier phrase or incorporating the classifier within the number phrase, to account for plurality. Considering a number cannot appear inside a nominal without the classifier phrase, and no modifier can intervene between the number phrase and the classifier phrase, the number and classifier must belong to the same projection, which is UnitP in this case. However, if number being omitted, the classifier alone can serve the function of counting or measuring. Also, if the classifier is duplicated, it signals plurality. Seen in example (9):

(9) a. Zhangsan jiao-guo ge xuesheng
Zhangsan teach-EXP CL student
'Zhangsan has taught a student'

b. Zhangsan ge-ge xuesheng dou hen congming
Zhangsan CL-CL student all very smart
Zhangsan's students all very smart (Hsu, 2012)

Unlike the UnitP, the DemP in Mandarin Chinese is able to co-refer and bind a pronoun. This comparison is presented in (10):

(10) a. *[$_{UnitP}$ san ge ren$_i$] tai-bu-qi liang jia ni gei tamen$_i$ de gangqin
three CL man lift-not-up two CL you give them DE piano
Three people cannot lift two (of the) pianos that you gave to them.

b. [$_{DemP}$ san ge ren$_i$] tai-bu-qi liang jia ni gei tamen$_i$ de gangqin
three CL man lift-not-up two CL you give them DE piano
Those three people cannot lift two (of the) pianos that you gave to them.

Moreover, demonstratives in Mandarin Chinese (e.g., *zhe* 'this', *na* 'that') can be demonstrative pronouns, which serves the similar function to those of determiners in English (seen in (11)).

(11) zhe/na shi yi duo hua
this/that is one CL flower
'this/that is a good book'

This section introduces the fundamental concepts of Mandarin Chinese, including its fixed word order and nominal expressions. The internal nominal structure proposed by Hsu (2012) has been accepted here and serves as the foundation for analyzing nominal structures in Mandarin Chinese. Since relative constructions function as modifiers of noun phrases, their analysis is closely tied to the structure of nominals. With this framework in mind, the following sections will focus on the analysis of relative constructions in Mandarin Chinese.

3.3 The Structure of Relative Clauses in Mandarin Chinese

The relative construction in Mandarin Chinese is composed of three essential elements: a head noun, a relative clause, and a fixed item *de*.

(12) [$_{Rel}$na-ben Mary du **de**] [$_{NP}$shu]
that-CL Mary read DE book
'the book that Mary read'

The example shown in (12) is the basic structure of relative clauses in Mandarin Chinese, which includes the head noun *shu* 'book' and the fixed item *de*, which is within the relative clause *na-ben Mary du de* 'that Mary read'. Starting from this basic construction, the following will extend to analyzing specific properties of relativization in Mandarin Chinese.

3.3.1 DP or NP?

Mandarin Chinese relative clauses, functioning as prenominal modifiers of nouns, blur the distinction between NP and DP analysis in their structural interpretation. According to the previous analysis, the nominal expressions in Mandarin Chinese is composed of a *three-layer* internal structre (Demonstrative phrase, Unit Phrase, Noun Phrase). If this proposed structure is on the right track, it is plausible to assume that the structure of Mandarin Chinese relative clauses is larger than Noun Phrase. The specific illustration of it will be presented in the following part.

In general, coordination is viewed as a diagnostic used to determine constituent structure. Aoun and Li (2003) argues that coordinators in Mandarin Chinese exhibit categorial restrictions and summarizes the usage of the most common coordinators *jian, he, gen,erqie* 'and' in Mandarin Chinese, as shown in (13):

(13) a. *jian* 'and' coordinates two NPs
b. *he / gen* 'and' coordinates two DPs

Building on (13), the application of these coordinators is illustrated in (14):

(14) a. ta shi [$_{UnitP}$ yi-ge [$_{NP}$ siji **jian/*he/*gen/*erqie** baoan]]
he is one-Cl driver and security
'he is a driver and security'

b. wo renshi [[$_{UnitP}$ yi-ge siji] **he/gen/*jian/*erqie** [$_{UnitP}$ yi-ge baoan]]
I know one-Cl driver and one-Cl security
'I know a driver and a security'

c. wo xinshang [[$_{DemP}$ zhe-ge siji] **he/gen/*jian/*erqie** [$_{DemP}$ na-ge baoan]]
I appreciate this-Cl driver and that-Cl security
'I appreciate this driver and that security'

d. [[wo xihuan Mary] **erqie/*jian/*he/*gen** [ta ye xihuan Mary]]
I like Mary and he also like Mary
'I like Mary and he also likes Mary'

The sentences from (14-a) to (14-d) reflect the different categories of conjoined items, which affect the option of the conjunctions. It is clear that *jian* 'and' applied in connecting two NPs (14-a); *he/gen* 'and' conjoins the UnitPs in (14-b) and the DemPs in (14-c); and *erqie* 'and' plays its function in connecting non-nominal categories (14-d). To be specific, *jian* 'and' requires the conjoined properties to denote one single individual while *he/gen* 'and' allows the properties to represent different individuals. Additionally, these coordinated structures support the plausibility of the proposed *three-layer* structure in

Mandarin Chinese nominal expressions: except for bare nouns, all nominal expressions possess an internal structure larger than NP. It is thus assumed that both UnitPs and DemPs behave like DPs.

The usage of coordinators summarized in (13), together with the proposed nominal structure in Mandarin Chinese (6), provides important evidence for the NP versus DP analysis of Mandarin Chinese relative clauses. Relevant examples of coordinated relative clauses are shown in (15).

(15) a. wo xiang zhao [$_{UnitP}$ yi ge [$_{NP}$ [$_{RC}$ fuze yingwen de] mishu]
I want find one CL charge English DE secretary
jian/*he/*gen [$_{NP}$ [$_{RC}$ jiao xiaohai de] jiajiao]].
and teach kid DE tutor
'I want to find a person who can be a secretary that takes care of English (matters) and can be kids tutor.

b. wo xihuan [$_{DemP}$ [$_{RC}$ fuze yingwen de] na yi ge mishu]
I like charge English DE that one CL secretary
he/gen/*jian [$_{DemP}$ [$_{RC}$ jiao xiaohai de] na yi ge jiajiao].
and teach kid DE that one CL tutor
'I like the secretary who takes care of English (matters) and the tutor that teaches kids.'

c. wo xihuan na [$_{UnitP}$ [$_{RC}$ fuze yingwen de] [$_{UnitP}$ san wei mishu]
I like that charge English DE three CL secretary
he/gen/*jian [$_{UnitP}$ liang wei jiajiao]].
and two CL tutor
'I like those three secretaries who take care of English (matters) and those two tutors who take care of English (matters).'

The DP coordinators *he* and *gen* 'and' can be used in (15-b) and (15-c), but only the NP coordinator *jian* 'and' is acceptable in (15-a). *he* and *gen* coordinate two distinct entities (two DPs), meaning that (15-b) and (15-c) each refer to two separate individuals *mishu* 'secretary' and *jiajiao* 'tutor'. In contrast, (15-a) refers to only one individual, *jiajiao* 'tutor', which does not satisfy the referential requirement of *he* and *gen*. Instead, *jian* is used to combine two NPs within a single DP, assigning two roles *fuze yingwen* 'responsible for English' and *jiao xiaohai* 'teaching children' to one entity. This shows that although NP coordination occurs internally, the entire relative clause in (15-a) remains a DP rather than an NP. In the following section, the possible positions for Mandarin Chinese relative clauses as prenominal modifiers will be discussed.

3.3.2 Possible Positions for Relative Clauses

In the previous section, it was established that Mandarin Chinese nominal expressions follows the fixed word order that is *Dem, Num-CL, N* with all modifiers appearing prenom-

inally. Thus, Hsu (2012) further suggests that the left edges of these three maximal projections are possible positions for relative clauses in his proposed nominal structure. The specific examples are concluded as (16).

(16) a. [$_{RC1}$ meiren yao de][$_{DemP}$ na [$_{UnitP}$ shi ben [$_{NP}$ shu]]]
nobody like DE that ten CL book
'[those ten volumes of books] that nobody likes'

b. [$_{DemP}$ na [$_{RC2}$ meiren yao de][$_{UnitP}$ shi ben [$_{NP}$ shu]]]
that nobody like DE ten CL book
'those [ten volumes of books that nobody likes]'

c. [$_{DemP}$ na [$_{UnitP}$ shi ben [$_{RC3}$ meiren yao de][$_{NP}$ shu]]]
that ten CL nobody like DE book
'those ten volumes of [books that nobody likes]'

d. *[$_{DemP}$ na [$_{UnitP}$ shi [$_{RC4}$ meiren yao de] ben [$_{NP}$ shu]]]
that ten nobody like DE CL book
Intended:'those ten volumes of books that nobody likes' (Hsu, 2012)

The violation in (16-d) proves that a relative clause cannot intervene between a number phrase and a classifier. In (16-a), a relative clause (RC1) appears higher than the demonstrative, the number, and the classifier. In (16-b), RC2 appears above the number and classifier but below the demonstrative. While, RC3 is below the demonstrative, the numer and the classifier. This hypothesis aligns with the one proposed in C. J. Huang et al. (2018), where he uses *I, II, III* to mark three possible positions for Mandarin Chinese relative clauses. *I* refers to the position before the demonstrative, *II* is between the demonstrative and the numeral, and *III* is between the classifier and the noun. After identifying the structure and positions of relative constructions in Mandarin Chinese, the following sections will focus on analyzing the three key elements (the head noun, the relative clause, and the fixed item *de* in relativization), in order to specify the properties of relative clauses in Mandarin Chinese.

3.3.3 The Relative Element *De* in Mandarin Chinese

The relative element *de* plays a fundamental role in the relativization process in Mandarin Chinese, and its classification has triggered intensive discussion in the literature. A general illustration of relative elements will be given before moving deeper to the analysis of *de* in Mandarin Chinese.

Classifying Relative Elements

As analyzed in the previous chapter, a relative pronoun (*who*, *which*, *when*, *where*, etc), a relative particle (*that*) and nothing at all (∅ replacing the relative pronoun or relative particle in some specific conditions) are three commonly used relative elements, which

functioning as markers of relative clauses in English. De Vries (2002) classifies relative elements into three main types: relative pronouns, relative particles, and resumptive pronouns. In his classification, relative particles encompass relative complementizers, relative markers, and relative affixes. However, since resumptive pronouns are not exclusive to relative clauses and are widely distributed across constructions involving A-bar dependencies, I exclude them here as a core type of relative element.

An obvious distinction between relative pronouns and relative particles is that the latter does not move from a gap position in the relative clause. In contrast, relative pronouns undergo wh-movement and bind a gap as a variable within the relative clause.

Among the various types of relative elements,The relative pronouns and relative complementizers (one sub-type of relative particles) are the most commonly employed across languages and are frequently compared in the literature. The fact is that the conditions set on the appearance of relative pronouns are much more restrictive than those on the relative complementizers. De Vries (2002), Kayne (1975), and C. Lehmann (1986) conclude three key differences between relative pronouns and complementizers:

(17) a. Relative pronouns are required to agree with the head noun, while complementizers are not.
b. Relative pronouns are required to bear Case, while complementizers are not.
c. Relative pronouns are allowed to combine with prepositions, while complementizers are not.

Example (17-a) means that relative pronouns bear θ features (person, number, gender), which agree with those of the head noun. This kind of agreement has been shown in (71), which is repeated here as (18).

(18) a. The student **who/that/** $\emptyset$ we saw in the class.
b. The flower **which/that/** $\emptyset$ we bought in the morning.

The variation in the choice of relative pronouns in (18) results form the [+/- animacy] features associated with *who* and *which*. Since relative pronoun must agree with the head noun in θ features, the head noun *student* in (18-a) chooses *who* with [+animacy] feature and the head noun *flower* takes *which* that lacking the *animacy* feature. In contrast, the relative complementizer *that* does not reflect this variation and can be applied in both cases.

Example (17-b) highlights another condition imposed on relative pronouns, namely Case marking. This requirement becomes particularly evident in languages with overt Case marking. Thus, the example in (19) cites a German relative clause to reflect the Case assignment of relative pronouns in relativization.

(19) German

a. der Mann$_i$, [$_{Rel}$ der t$_i$ Peter geholfen hat t$_i$]
the-NOM man-NOM who-NOM Peter helped has
'the man who helped Peter' (Brandt et al., 2008)

b. ich fürchte den Herrn [$_{Rel}$ der eine Pistole trägt]
I fear the-ACC gentleman-ACC who-NOM a gun carries
'I fear the gentleman who carries a gun' (De Vries, 2002)

Example (19-a) reflects the Case match between the head noun *Mann* 'man' and the relative pronoun *der*, which follows the rule explained in (17-b). In contrast, (19-b) demonstrates a violation of this Case matching. This kind of violation in German is not rare and is also attested in other languages (review (19) in Polish, repeated here as (20)).

(20) widziaem tego pana [$_{Rel}$ który zbi ci szyb] (Polish)
saw-1SG this-ACC man-ACC which-NOM broke you glass
'I saw the man who broke your glass' (Borsley, 1997)

As analyzed before, this kind of Case mismatch supports the existence of *matching* analysis, which means the presence of a head noun within the relative clause that bears the same case as the relative pronoun. Under the *double-Headed structure*, Case assignment is much more clear. Reviewing that the relative pronoun is naturally a remnant of the internal Head due to the distinctness between the two Heads (the internal one is larger than the external one), it is expected that the relative pronoun ought to share the same Case as the internal Head. (19-a) illustrates a situation in which the external Head and internal Head bear the same Case, resulting in no overt Case mismatching . If the Case of the internal and external Heads differ, as in (19-b) and (20), the relative pronoun will display the Case of the internal one rather than that of the external one (the overt Head), thereby resulting in an observable Case mismatch.

(21) the book in which/*that I found the picture.

Example (21) denotes a case where the relative complementizer *that* is not able to coexist with the preposition *in*. This unacceptable combination stems from selectional restrictions. The complementizer is commonly assumed to be a kind of functional head in the literature (Blockley, 2001; Kayne, 1999; Newbrook, 1998; Poletto & Sanfelici, 2018; Pullum & Huddleston, 2002). Concerning that functional heads cannot select prepositions, it is plausible that prepositions can combine with relative pronouns instead of relative complementizers in relativization.

Another key point denoted in (18) is the appearance of the null element $\emptyset$ in English, which represents zero relativization of the relative complementizer. R. J. C. Smits (1988) outlines a set of universal conditions under which this type of zero relativization is permissible (seen in (22)):

(22) a. the relative clause is restrictive
b. a relative complementizer particle is allowed
c. the relativized noun is not the subject of the relative clause
d. the relative clause cannot be extraposed (except in Danish) [2]

De Vries (2002) concludes the types of relative complementizers and pronouns, the former one is composed by four main types while the latter one has three main forms. In his work, relative complementizers can be divided into *subordinator*, *specialized*,*nominalizing* and *attributive* based on their functions across languages.For example, *wos* in German serves as a specialized relative complementizer, while subordinators like *that* in English behave similarly to standard complementizers. Mandarin Chinese *de* is commonly analyzed as a nominalizing relative complementizer, a topic to be examined in more detail later. In Akkadian, *u* functions as an attributive relative complementizer. Relative pronouns, by contrast, are classified depending on their various morphology, which are d-format relative pronouns, wh-format relative pronouns, and specialized format relative pronouns. The d-format includes pronouns based solely on demonstratives, such as *der* in German. The wh-format contains interrogative morphology, exemplified by English *who*. The specialized format includes unique morphemes not derived from either demonstrative or interrogative roots, such as *jo* in Hindi.

Although relative pronouns and complementizers are the most widely used relative elements cross-linguistically, relative markers and affixes(subtypes of relative particles) also play an important role in certain languages and should not be overlooked.Thus, a brief introduction to these two sub-types of relative particles will be given here.

As a subtype of relative particles, relative markers do not undergo wh-movement from a gap position within the relative clause to the higher position. However, they tend to agree with the head noun, which behaves differently to complementizers (no Case and no Agreement with the head noun).

(23) **ki**t [**ki** a-swiim-in Kipes zoon] (Hungana)
CL7:chair CL7 SBJ/CL1-bought-PRET Kipes yesterday
'(the) chair which Kipes bought yesterday' (De Vries, 2002; C. Lehmann, 1984)

The relative clause in Hungana (23) shows its specialty, where existing two equal classifiers *ki*. Given that Hungana lacks overt determiners, the structure of (23) is plausibly analyzed as [CL-N CL IP]. As a classifier language, there is no overt Case requirement for Hungana. Thus, the most reasonable interpretation of the second *ki* is that it functions as a relative marker in the sentence-initial position; otherwise, its presence would appear superfluous. Caponigro (2000) and Longobardi (2008) believe that a nominal expression can only serve

[2]De Vries (2002) points out that (22-c) is not always true in some languages like Komso, Lakota,Mlbum, Moore and Yukatekan, which take zero relativization as the primary strategy

as an argument only if it is introduced by a category D^0. If this is on the right track, the second *ki* can be undrstood as a D-like element, compensating for the absence of a determiner in Hungana. Furthermore, (23) also reflects that the head noun *t* and the relative marker *ki* share the same θ features. These properties of relative markers are not unique to Hungana. Similar patterns have been observed in languages that are restricted by the Case system. Deutscher (n.d.), Hasselbach (2007), and Watson, Retsö, et al. (2009) point out that relative markers in relativization originate from demonstratives and exhibit agreement with head nouns in terms of Case, Gender, and Number.

(24) eql-am [ša ... nltiq-u] lišqi'u (Old Akkadian)
field-ACC ACC.M.SG we.passed-SUB they.should.water
'they should water the field that we passed' (Deutscher, n.d.)

As shown in (24), *ša* functions as a relative marker in Old Akkadian (a language overt Case marking). Notably, *ša* can also serve as a demonstrative bearing Accusative Case in Old Akkadian. This dual functionality supports the previous hypothesis that the nature of relative markers is a D-like element. In all, Case assignment and agreement with the head noun make a distinction between relative markers and relative complementizers.

The third class of relative particles is relative affixes, which refer to relative elements that are affixed to verbs in relativization.

(25) [namca-ka po-nun] yeca (Korean)
man-NOM see-RC.PRS woman
'the woman who the man sees' (O'Grady et al., 2003)

(25) is the case where the relative affix is applied in relativization, *nun* which marks the Present tense for the relative clause *namca-ka po-nun* suffixes to the verb *po* 'see'. De Vries (2002) hypotheses that relative affixes, which are used to add some extra information to relative clauses, do not play the primary role in relativization as other relative elements do. Their main function is to mark the clause as relative. Otherwise, the relative clause will lack an overt marker.

This overview of relative elements provides a foundation for the subsequent analysis of *de* in Mandarin Chinese relative clauses.

The Distribution of *De* in Mandarin Chinese

De is an essential element in the formation of relative clauses in Mandarin Chinese. However, it not only exists in relative clauses but can also be found in other constructions. C. N. Li and Thompson (1989) claim that *de* plays its function in nominalization [3],

[3]In their work, relative clauses are treated as instances of nominalization and *de* is a marker in all structures. This study does not engage with the validity of that claim but adopts their categorization to help generalize the distribution of *de* in Mandarin Chinese

associative phrases, resultative verb compounds, manner adverbs, and complex sative constructions in Mandarin Chinese.Based on this distribution, the following (26) (27) (28) present a conclusion on these *de* structures.

(26) a. wo de chenshan (associative phrase)
I DE shirt
'my shirt'

b. piaoliang de nvhai (adjectival modification)
beautiful DE girl
'a beautiful girl'

c. Zhangsan hua hua de fangjian (relative clause)
Zhangsan paint painting DE room
'the room where Zhangsan does his painting'

d. huahua de fangjian (relative clause)
paint DE room
'the room which is set for painting'

(27) a. ta zou de hen kuai (complex sative construction)
3SG walk DE very quick
'S/he walked very quickly'

b. ta tiao de guo qu (resultative verb compound)
3SG jump DE cross go
'S/He can jump across'

(28) a. ta kuai-kuai-de zou (manner adverb)
3SG quickly-DE walk
'S/He walked quickly'

b. ta nuli de xuexi (manner adverb)
3SG effort DE study
'S/He studies diligently'

The criterion for dividing *de* structures into three groups ((26) (27) (28)) is based on the types of modifiers and their corresponding head nouns. In (26), *de* connects the Noun *wo* 'I' (26-a), the Adjective *piaoliang* 'beautiful' (26-b), the dependent clasue *zhangsan huahua* 'Zhangsan paint' (26-c), the verb phrase *huahua* 'paint' to their respective head nouns: *chenshan* 'shirt', *nvhai* 'girl' and *fangjian* 'room'. While, (27) illustrates different cases where *de* links the verbs *zou* 'walk' (27-a) and *tiao* 'jump' (27-b) to their respective heads :the degree complement *hen kuai* 'very quick' and the result complement *guo qu* 'jump across'. (28) is another case where *de* turns the adjective *kuai-kuai* 'quick' (28-a) and the noun *nuli* 'effort' (28-b) into adverbs to describe how the actions *zou* 'walk' and *xuexi* 'study' are performed.

To summarize, the heads in *de* structures can be nouns, verbs and complements, and their modifiers can be nouns, adjectives, verbs, and verb phrases. C. Ross (1983) holds the view that *de* always occurs between the head and modifier, maintaining a uniform

syntactic formation across all contexts. The different interpretations of *de* structures are caused by the semantic relationship between the head noun and modifier. It means all *de* in Mandarin Chinese is simply used to indicate modification or prediction. Obviously, this idea ignores the structural properties of *de* itself.

A particularly ambiguous distinction arises between examples such as (26-b) and (26-d), where both involve modification of a noun and often appear formally similar. One useful diagnostic for distinguishing them is the presence of a verb: relative clauses typically contain verbs or full predicate structures, while adjectival modifiers do not. Additionally, adjective modifiers attribute descriptive qualities to the noun, whereas relative clauses offer specific, often restrictive, information. Therefore, constructions in which *de* links a verb or dependent clause to a noun are considered instances of relative clauses in Mandarin Chinese, as shown in (29):

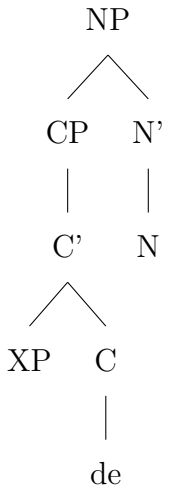
(29) $[_{RC}$ (Subject) + Verb + DE] + Noun

The following parts will analyze the syntactic role of *de* in Mandarin Chinese relative clauses and three major theoretical accounts:a complementizer (L. L. S. Cheng, 1986; Chiu, 1993; Ning, 1993; Waltraud, 2007), a nominalizer (Paris, 1979; N. Zhang et al., 1999) and a determiner (Simpson, 2002; Simpson & Wu, 2002).

De as a Complementizer in Mandarin Chinese Relative Clauses

L. L. S. Cheng (1986) proposes that *de* is a head-final complementizers in Mandarin Chinese relative clauses. In her hypothesis, *de* does not impose any restrictions on the syntactic category of its complement. This assumption is illustrated in the following structure (30):

(30)



In (30), XP is defined as the modifying elements (the complements of *de*), which can be AdjPs, PPs, NPs, or TPs. L. L. S. Cheng (1986) treats all these various pre-nominal

modifiers as full or reduced forms of relative clauses. However, the head-final complementizer *de* hypothesis appears to contradict the word order pattern of Mandarin Chinese discussed in the previous section, which states that, with the exception of nouns, all X' categories are head-initial.

Following L. L. S. Cheng (1986)'s work, the complementizer status of *de* has been confirmed by Chiu (1993), Ning (1993), and D. Xu (1997), but they maintain that *de* is head-initial which takes an inflection phrase (IP) as its complement. In accordance with Kayne (1994)'s proposal of universal phrase structure, where all phrases are underlying head-initial and right-adjunction is not allowed. They assume that the surface order of the *de* construction [[XP *de*]NP] (XP refers to the modifying element) is derived by syntactic movement. In this case, the head-initial complementizer status of *de* can be explained. The proposal that *de* functions as a nominalizer will be introduced in the following part.

De as a Nominalizer in Mandarin Chinese Relative CLauses

In N. Zhang et al. (1999)'s analysis, *de* is a nominal marker in Mandarin Chinese that heads an nP. This assumption is motivated by the observation that the noun phrase (NP) in *de* constructions can sometimes be omitted (see the comparison in (31)). He defines this construction, where the NP is elided, the *de dependent construction*.

(31) a. wo renshi nei ge mai yinliao de xiao guniang
I know that-one CL sell beverage DE little girl
'I know that little girl who sells beverage'

b. wo renshi nei ge mai yinliao de
I know that-one CL sell beverage DE
'I know that beverage seller'

(31-a) is the common representation of relative clauses in Mandarin Chinese with the construction [[XP *de*] NP] (XP refers to the modifying element). It is obvious that the modified NP *xiao guniang* 'little girl' is allowed to be deleted like that in (31-b), without resulting in ungrammaticality. Moreover, N. Zhang et al. (1999) assumes that *de* always occurs in a nominal projection (seen in (32) and (33)).

(32) a. I read the book *that* you bought.

b. I do not know *that* he has bought the book.

c. *That* he bought the book surprised me.

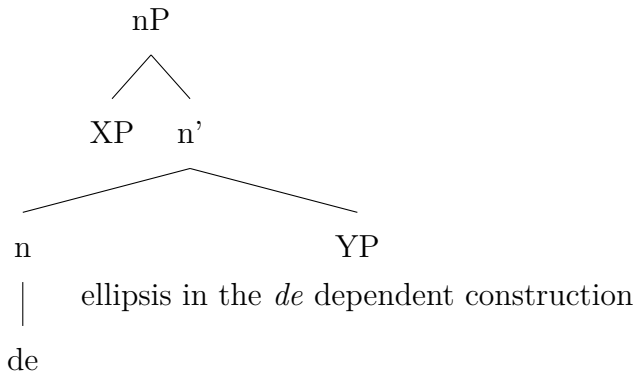
(33) a. wo renshi nei ge mai yinliao *de* xiao guniang.
I know that-one CL sell beverage DE little girl
'I know the little girl who sells beverage'

b. wo bu zhidao ta mai-guo yinliao (*de).
I not know he sell-ASP beverage
'I do not know that he sold beverage'

c. ta nayang mai yinliao (*de) rang wo weinan.
he so sell beverage DE let me embarrassed
'That he sold beverage in that way made me embarrassed'

The examples cited in (32) and (33) provide a comparative perspective. The complementizer *that* in English can occur in various clause types: at the beginning of a relative clause (32-a), a complement clause (32-b), and a subject clause (32-c), while *de* in Mandarin Chinese is not permitted in either complement clauses (33-b) or subject clauses (33-c). A plausible reason for this phenomenon is that complement and subject clauses are not elements of a nominal projection, which violates the distributional requirement for *de*. If this is on the right track, it suggests that relative clauses in Mandarin Chinese function as non-head elements within a nominal projection, which makes the occurrence of *de* at the end of a relative clause become available. Thus, the structure of *de* construction (relative clauses are also included) in Mandarin Chinese can be written as the following:

(34)



As a nominal marker, *de* functions to project a syntactic node capable of dominating two phrases (XP and YP). Drawing on Chomsky (2014)'s definition of the light verb (vP construction), N. Zhang et al. (1999) views the *de* structure illustrated in (34) as an nP. Another popular idea of *de* is to define it as a kind of determiner, which will be explicitly analyzed in the next part.

De as a Determiner in Mandarin Chinese Relative Clauses

Mandarin Chinese exhibits an unusual typological combination of verbobject (VO) word order and pre-nominal (RC-N) relative clauses [4]. According to Greenberg (1963)'s universal analysis, pre-nominal relative clauses are typically associated with object-verb (O-V) languages. Thus, Dryer (1992) views Mandarin Chinese relative clauses as a unique representation. Based on this unique configuration, Simpson (2002) claims that the nature of *de* is a determiner, a view that helps to explain the formation of pre-nominal relative clauses in Mandarin Chinese.

[4] A detailed discussion of Mandarin Chinese relative clauses will be shown in the next section.

Grosu (1988) suggests that definite determiners in Romanian are a kind of enclitic, which triggers the movement of certain elements to pre-determiner positions. Through the analysis, Simpson (2002) holds the view that *de* in Mandarin Chinese shares similar properties with these definite determiners found in Romanian.

(35) Romanian

a. *-ul potret unei fete
the portrait a GEN girl

b. potret$_i$-ul t$_i$ unei fete
'the portrait of a girl'

c. frumos$_i$-ul t$_i$ baiat
nice-the boy
'the nice boy' (Simpson & Wu, 2002)

As shown in (35), *ul* is a definite determiner in Romanian. The example in (35-a) reflects that if no element is raised to the left of *ul*, the sentence will be problematic. The well-formed structures denoted in (35-b) and (35-c) suggest that there are no strict constraints on the category of the raised element, allowing either the NP *potret* 'portrait' (35-b) or the AP *frumos* 'nice' (35-c) to be raised. Grosu (1988) argues that this raising requirement arises from the need to provide leftward phonological support for the enclitic definite determiner, a condition that does not apply to indefinite determiners.

(36) un portet al unei fete (Romanian)
a portrait of-the one girl
'a portrait of the girl' (Simpson & Wu, 2002)

Unlike *ul*, the indefinite determiner *un*, as shown in (36), does not require the leftward movement of other elements. The properties of the definite determiner *ul* appear to parallel that of *de* in Mandarin Chinese, which is illustrated in the following (37):

(37) a. [$_{IP}$ wo zuotian mai]$_i$ de nei-ben [$_{CP}$ shu [t$_i$]]
I yesterday buy DE that-CL book
'the book I bought yesterday'

b. [wo]$_i$ de t$_i$ nei-ben-shu
I DE that-CL-book
'that book of mine'

(37) presents the derivation of *de* constructions in Mandarin Chinese, assuming that *de* functions as an enclitic, specifically a definite determiner. In Simpson and Wu (2002)'s hypothesis, *de* attracts the XP-element (such as the IP *wo zuotian mai* 'i bought yesterday' (37-a) or the NP *wo* 'i' (37-b)) to a preceding position of itself (Spec, DP). If this is on the right track, it not only explains the formation of pre-nominal relative clauses in Mandarin

Chinese, but also confirms the position of C^0 in Kayne (1994)'s hypothesis. Kayne (1994) suggests that C^0 may occupy only two positions: either preceding the raised relative clause or following the head noun, thereby preserving the antisymmetric structure and avoiding rightward adjunction. However, the surface position of *de* in Mandarin Chinese appears to violate this rule (seen in (38)).

(38) a. [qu Beijing] de ren
go Beijing DE person
'the person who went to Beijing'

b. $[[_{IP}\ t_i$ qu Beijing$]_k$[de$[_{CP}$ ren$_i$] $t_k]]$

c. # qu Beijing **de** ren #

Following Kayne (1994)'s *raising* hypothesis of relativization, the derivation of the sentence in (38-a) is illustrated in (38-b). However, if *de* is a complementizer, it ought to be in the position marked by the hash in (38-c) according to Kayne (1994)'s hypothesis. The fact that *de* does not appear in this position represents a violation of the predicted word order. This discrepancy supports the determiner hypothesis of *de* in Mandarin Chinese. Szabolcsi (1994) proposes that both determiners and complementizers can act as subordinators. While determiners only mark subordination, complementizers typically signal both subordination and clause type. For example, the complementizer *that* in English is able to denote a declarative clause type, while *de* in Mandarin Chinese is much more like a pure subordinator. Thus, *de* is much more like a determiner instead of a complementizer.

In the broader literature, *de* in Mandarin Chinese has also been viewed as a marker of predicate inversion (Den Dikken, 2006; Den Dikken & Singhapreecha, 2004), a case assigner (Hui, 1990; R. K. Larson, 2009), a type-shifter (S.-Z. Huang, 2006) or a classifier (L. Cheng & Sybesma, 2009; X.-P. Li, 2011). These diverse perspectives largely focus on the structure [XP *de* YP],where*de* can form a constituent either with XP, with YP, or with both. These can be analyzed as [[XP *de*] YP], [XP [*de* YP]] or [XP *de* YP]. Thus, the category of *de* has a profound effect on the structure of [XP *de* YP].

It seems complicated to generalize the view of *de* in all Mandarin Chinese constructions. The focus of this research is on relative constructions, in which I prefer to define *de* as a complementizer. The points that support this hypothesis are summarized in (39).

(39) a. *de* subordinates a Clause to a Noun.

b. *de* heads a CP and allows movement.

c. *de* allows recursive embedding.

A detailed explanation of (39) will be provided below. As in (39-a), the most basic function of a complementizer in relative clauses is to mark the boundary.

(40) a. the book [that I bought _].

b. [wo mai _ de] shu
I buy DE book
'the book that I bought'

The Mandarin Chinese relative construction in (40-b) is a paraphrase of the English construction in (40-a). It is evident that *de* plays a syntactic role similar to that of English complementizer *that*, taking *wo mai* 'I bought' as its complement. Moreover, the examples in (40) can also be a proof to (39-b). The movement of a noun phrase from its original position to the head noun position is a key feature of relative clauses. In (40-a), *the book* is originated in the object of *bought* before moving to the front. A similar pattern occurs in (40-b), where *shu* 'book' initially functions as the object of *mai* 'buy' before moving to the head position. In this case, *de*, like the complementizer *that* in English, can also be regarded as part of a CP structure that facilitates this movement.

(39-c) reflects the other defining feature of complementizers is that they allow recursion, meaning a relative clause can be embedded inside another relative clause when a complementizer is present. Seen in the following (41):

(41) a. the book [that my friend recommended [that I bought _]].
b. [wo pengyou tuijian de [wo mai de]] shu
I friend recommend DE I buy DE book
'the book that my friend recommended that I bought'

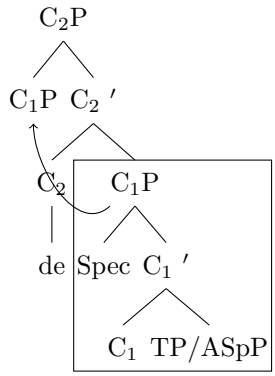
From (41-a) and (41-b), it is obvious that both *that* and *de* can allow the layering of multiple relative clauses, supporting the possibility of *de* functioning as a complementizer.

According to the evidence presented above, *de* in Mandarin Chinese relative clauses is highly likely to function as a complementizer. To be noticed, *de* is a obligatory complementizer in relative constructions, as seen in (42):

(42) a. the man *(that) lives next door is friendly.
b. the book (that) I bought is interesting.
c. wo mai *(de) shu
I buy DE book
'the book that I bought'
d. changge *(de) nvhai
sing DE girl
'the girl who sings'

From the examples cited above, it is evident that the complementizer *that* is optional in the object relative clause (42-b) but obligatory in the subject relative clause (42-a). In contrast, (42-c) and (42-d) indicate that *de* is obligatory in both subject and object relative clauses. Considering the word order rules of Mandarin Chinese, *de*, as a complementizer, is a head-initial. If this is on the right track, *de* in Mandarin Chinese relative clauses can be illustrated as shown in (43).

(43)



In (43), *de*, as a head-initial complementizer, tiggers the movement of C_1P to the Spec,C_2P. This movement indicates that Mandarin Chinese relative clauses are derived from the postnominal form.

The following section will focus on the structures of relative clauses in Mandarin Chinese. As a special kind, the Mandarin Chinese relative clauses are essential for the universal analysis of relativization.

3.3.4 Typology of Relative Clauses in Mandarin Chinese

The typology of Mandarin Chinese relative clauses can be examined from both syntactic and semantic perspectives, each offering valuable insights into their structural and interpretive properties. These two aspects will be discussed in the following sections.

Syntactic Typology

The most common form in Mandarin Chinese relative clauses is the pre-nominal one. The previous example in (12), which indicates this pre-nominal relative construction in Mandarin Chinese, is repeated here as (44).

(44) [$_{Rel}$ na-ben Mary du **de**] [$_{NP}$shu]
that-CL Mary read DE book
'the book that Mary read'

It is evident that the relative clause *na-ben Mary du de* 'that Mary read' is before the head noun *shu* 'book,' which forms a RelN order. However, the existence of this kind of pre-nominal relative construction in Mandarin Chinese appears to violate the universal rule concluded by Greenberg (1963).

(45) Mary mai-le yi-ben shu
Mary buy-PER one-CL book
'Mary bought one book'

The example in (45) reflects the basic SVO order in Mandarin Chinese, where *Mary* is the subject and *mai* 'buy' is the verb followed by the object *shu* 'book'. In the universe, such

a word order tends to constrain the presence of pre-nominal relative clauses. Recalling the universal patterns proposed by Greenberg (1963) in (46).

(46) Greenberg's universal rules
Universal 24: If the relative expression precedes the noun either as the only construction or as an alternative construction, either the language is postpositional, or the adjective precedes the noun or both.

Greenberg (1963)'s Universal rules illustrated in (46) suggest that relative clauses, adjectival and genitive expressions, these nominal modifiers, ought to precede nouns in OV languages and follow nouns in VO languages. W. P. Lehmann (1973) supports it and claims that modifiers are required to be placed on the opposite side of the basic syntactic elements from their primary concomitant. Here, verbs are the primary entities that accompany objects. Thus, as a modifier, relative clauses ought to appear before nouns (pre-nominal) in OV languages and after nouns (post-nominal) in VO languages.

(47) Pre-nominal relative clauses in OV languages (Japanese)

[$_{Rel}$ nezumi ga tabeta] cheese
rat NOM ate cheese
'the cheese that the rat ate' (Kuno, 1974)

(48) Post-nominal relative clauses in VO languages
The book [$_{Rel}$that Jane bought].

The examples shown in (47) and (48) confirm with Greenberg (1963)'s universal rules. However, Mandarin Chinese reflects an exception to this universal rule. Dryer (1992) corrects Greenberg (1963)'s word order hypothesis and proves that OV languages appear to show no preference for either RelN or NRel through analyzing 543 languages. Mandarin Chinese, in his analysis, is considered an exception, as it displays RelN order despite being a VO language (see specific data in (49)).

(49) Order of the head noun (N) and relative clause (Rel)

OV/VO	NRel	RelN
OV	37	26
VO	60	1

Diessel (2001) and Hawkins (2014) believes that VO languages are exclusively with initial Complementizers, while OV languages permit either initial or final Complementizers. Thus, Cinque (2005) suggests that the option of RelN and NRel word orders in OV languages is largely determined by the properties of their complementizers. In his hypothesis, OV languages which allow post-verbal subordinate clauses are classified as non-rigid, while those that do not are considered rigid. Kayne et al. (2000)'s analysis further supports

the correlation between the presence of initial complementizers and the occurrence of post-nominal relative clauses.

(50) a. [[we bought [which expensive book]] expensive book]
b. C[[we bought [which expensive book]] expensive book]
c. [we bought [which expensive book] C [t] expensive book]
d. [that [[we bought [which expensive book]] C [t] expensive book]]
e. [which expensive book [that [[we bought t] C [t] expensive book]]
f. X [which expensive book [that [[we bought t] C [t] expensive book]]
g. [expensive book X [~~which expensive book~~ [that [[we bought t]] t]] C [t]
h. (I lost) the [expensive book X [~~which expensive book~~ [that [[we bought t]] t]] C [t]

Cinque (2005) cites English as an example (seen in (50)) to exemplify the derivation of relative clauses and to emphasize the role of initial complementizers in determining the final overt word order of relative constructions. Kayne et al. (2000) suggests that the complementizer is just an attractor of the clause and rather than merging with it directly. Thus, the clause tends to be generated in an argument or adjunct position alone and subsequently moved to the specifier of a higher functional head (C), with the overt complementizer inserted afterward. The derivational steps from (50-a) to (50-f) reflect this process, while steps (50-g) to (50-h) demonstrate the function of the complementizer in converting the word order. The complementizer *that* is an initial one, which has the property of attracting a subpart of the infinitive phrase to Spec, *that*. The hypothesis made here is that the presence of an initial complementizer is a defining feature of VO and non-rigid OV languages. If this is on the right track, the presence of pre-nominal relative clauses in Mandarin Chinese trigger confusion again presents a challenge, particularly under the assumption that the relative element *de* functions as a complementizer. If *de* is a complementizer, according to the X-bar schema in Mandarin Chinese (discussed in (3)), *de* would be expected to behave like an initial one. Obviously, this assumption directly contradicts Cinque (2005)'s universal analysis regarding the syntactic positioning of initial complementizers in relativization. Thus, if *de* is indeed a complementizer in Mandarin Chinese relative constructions, it should be endowed with special properties that set it apart from typical initial complementizers.

Although post-nominal relative clauses are forbidden in formal Mandarin Chinese, they do exist in colloquial speech. As a relative element, *de* is obligatory in canonical pre-nominal relative clauses but tends to be optional in non-canonical post-nominal ones.

(51) a. ta you yi ge **meimei** [$_{Rel}$ hen xihuan kan dianying]
3SG have one CL younger.sister very like see movie
'He has a younger sister who likes seeing movies.' (C. N. Li & Thompson,

1989)

b. wo ziji mei-you **jiezhi** [$_{Rel}$ dai-zhe he-shi de],...
1SG -self NEG-have ring wear-CON fit DE
'I do not have a ring which fits my finger,...' (Wang & Wu, 2020)

c. **dangshiren** [$_{Rel}$ dui panjue bufu de]
litigant to judgment unsatisfied DE
'Litigants who are not satisfied with the judgment' (Wang & Wu, 2020)

The relative element *de* is omitted in example (51-a), which does not result in ungrammaticality. Examples (51-b) and (51-c), which retain de, are attested in spoken Mandarin Chinese and legal documents separately. These post-nominal relative clauses in Mandarin Chinese can be viewed as an alternative to the canonical pre-nominal form, which is motivated by information structure in spoken discourse. Due to their limited distribution,the post-nominal structure is not the focus of this research. To conclude, the pre-nominal relative clause is the dominant and syntactically canonical form in Mandarin Chinese, representing an exception to the universal order rule. The next part will analyze the structures of Mandarin Chinese from a semantic perspective.

Semantic Typology

The above discussion clearly shows that pre-nominal relative clauses are the typical syntactic typology in Mandarin Chinese. Although post-nominal relative clauses do occur, their usage is largely restricted to spoken discourse and specific contexts such as legal documents. However, the classification of Mandarin Chinese at the semantic level is full of disputes. The primary debate centers on whether non-restrictive relative clauses genuinely exist in Mandarin Chinese.

According to C. J. Huang et al. (2018)'s analysis, the surface ordering of noun phrases in Mandarin Chinese can be represented as below (52):

(52) Demonstrative + Number + Classifier + Noun
zhe yi zhi mao
this one CL cat
'this (one) cat'

Based on this [Dem-Num-CL-N] word order, C. J. Huang et al. (2018) identifies three potential positions where relative clauses can appear: before the demonstrative (53-a) (marked as I); between the demonstrative and number (53-b) (marked as II); and between the classifier and noun (53-c) (marked as III).

(53) a. [$_{Rel}$ ta xihuan de] na (yi)-ge haizi
he like DE that one-CL child
'the child that he likes'

b. zhe [Zhangsan shuo chulai de] yi-ju hua
this Zhangsan speak out DE one-CL word
'this one sentence that Zhangsan speak out'

c. na (yi)-ge [$_{Rel}$ ta xihuan de] haizi
that one-CL he like DE child
'the child that he likes'

Given that position II is not considered a natural expression of relative clauses in Mandarin Chinese, C. J. Huang et al. (2018) confirms that only positions I and III are available for relative clauses. Moreover, these two positions have often been used in the literature as a diagnostic tool to distinguish between restrictive and non-restrictive relative constructions in Mandarin Chinese. However, there is no consensus on this classification. Chao (1965) and C.-T. J. Huang (1998) argues that relative clauses in position I are restrictives, while those in position III are interpreted as non-restricitves. The differing interpretations associated with these two positions are illustrated in (54):

(54) a. [$_{Rel}$ dai yanjing de] nei-wei xiansheng shi shei?
wear glasses DE that-Cl mister be who
'who is the woman who is wearing the hat (not the one who is not wearing the hat)?

b. nei-wei [$_{Rel}$ dai yanjing de] xiansheng shi shei?
that-Cl wear glasses DE mister be who
'who is the gentleman (who incidentally is) wearing glasses? (Chao, 1965)

However, Tsai (2014) takes an opposing stance, arguing that a relative clause appearing before all nominal modifiers (i.e., in Position I) yields a non-restrictive interpretation, whereas a relative clause situated between the demonstrative, numeral, and classifier (i.e., within the Dem-Num-CL sequence) results in a restrictive reading.

(55) a. *zuotian si-le [$_{Rel}$ conglai bu xizao de] san-ge ren
yesterday die-Prf ever not bathe DE three-Cl person
'Yesterday three people who never bathed died'

b. zuotian si-le san-ge [$_{Rel}$ conglai bu xizao de] ren
yesterday die-Prf three-Cl ever not bathe DE person
'Yesterday three people who never bathed died' (Tsai, 2014)

Following the idea of Tsai (2014), the relative clause in (55-a) appears before all the modifiers, indicating that it should be non-restrictive. The head noun, *san-ge ren* 'three people', is an indefinite expression. The ungrammaticality of (55-a) arises because appositive relative clauses do not permit indefinite head nouns. In contrast, no such violation occurs in (55-b), where the relative clause appears in position III. This is because the relative clause in this position is restrictive, allowing it to modify the indefinite head noun *ren* 'people'. However, Del Gobbo (2003, 2004, 2005) and N. Zhang (2001) deny the

distinction between these two positions and argue that the relative clauses in both are restrictive. Similarly,Lu (1998) claims that non-restrictive relative clauses do not exist in Mandarin Chinese. He suggests that the relative clause appeared in position I is to identify the referent of a nominal expression. In contrast, the one in position III is provides a description of a property, which is illustrated by (56):

(56) a. [$_{Rel}$ zui-gao de/ jiao-gao de /gao de /?hen-gao de /??gao-gao de] zhe 2-ke songshu
most-tall DE/ relatively-tall DE/ tall DE/ very-tall DE/ tall-tall DE this 2-CL pine.tree
'these two pine trees which are the tallest/tall/taller/very tall/pretty tall'

b. zhe 2-ke [$_{Rel}$ zui gao de/jiao gao de/gao de/hen gao de/ gao-gao de] songshu
the 2-CL most-tall DE/ relatively-tall DE/ tall DE/very tall DE/ tall-tall DE pine.tree
'these two tallest/tall/taller/very tall/pretty tall pine trees'

The superlative, comparative, pure, and reduplicated adjective phrases are used separately in (56). As modifiers within noun phrases, superlative adjective phrases are most likely to appear in (56-a), while reduplicated adjectives are used rarely in this position. However, there is no obvious difference in the usage of various adjectives in (56-b). This distinction can be attributed to the different functions that adjectives fulfill in these two positions. In position I (before the demonstrative), as in (56-a), adjective phrases serve to identify the referent *songshu* 'pine tree' and distinguish, for example, the tallest *songshu* from others. In position III (between the classifier and the noun), as in (56-b), the adjective phrases simply describe the state or property of the referent *songshu* 'pine tree', thus allowing a wider range of adjectival expressions.

Lin et al. (2003) supports their idea that the relative clause's position does not determine whether it is restrictive or non-restrictive. Instead, a non-restrictive interpretation becomes possible when the modified item is a proper name or pronoun as shown in (57):

(57) [$_{Rel}$ hen ai chi niupai de] **Laowang** jintian que dian-le yupai
very love eat beef-steak DE Laowang today but order-Asp fish-steak
'(To our surprise), Laowang, who loves eating steak very much, ordered fish steak today'

It is obvious that the name *Laowang* is the head noun (modified item) in example (57). Thus, this relative clause receives an appositive interpretation. Del Gobbo (2010) accepts Lin et al. (2003)'s hypothesis of appositives in Mandarin Chinese but he maintains that Mandarin Chinese non-restrictive relative clauses are quite differently from their canonical counterparts due to the unique characteristics of relative clauses in Mandarin. Recalling

the discussion of English restrictive and non-restrictive relative clauses in the previous chapter, the compared example (68) is repeated here as (58).

(58) a. The students that failed the test on syntax. (restrictive relative clauses)
b. The students, who failed the test on syntax. (non-restrictive relative clauses)

From the examples cited in (58), the English appositive relative clause exhibits distinct structural features, including the separation of the head noun and the clause by commas and the use of relative pronoun *who* instead of the complementizer *that* to introduce the clause. However, Mandarin Chinese relative clauses lack relative pronouns, relying solely on the fixed element *de* as the relativizer. This makes it difficult to distinguish between restictive and non-restrictive relative clauses. In other words, appositive relative clauses in Mandarin Chinese share the same structural form as restricitve ones. In this part, I have provided a general overview of Mandarin Chinese relative clauses from a semantic typological perspective. Although there is sno consensus regarding the of non-restrictive relative clauses in Mandarin Chinese, it is not reasonable to dismiss the possibility of appositive constructions outright, especially in light of the evidence discussed above, which suggests that non-restrictive interpretations are indeed possible. A deeper discussion about non-restrictive relative clauses will be shown in the next chapter, where the characteristics of non-restrictives in Mandarin Chinese will be much more salient through a cross-linguistics comparison.

3.3.5 Relativized Elements in Mandarin Chinese Relative Clauses

In the previous sections, Mandarin Chinese relative clauses have been categorized based on their syntactic (pre-nominal relative clauses) and semantic typology (restrictive and non-restrictive relative clauses). Moreover, Mandarin Chinese relative clauses can also be classified as subject, object, and adjunct relative clauses, depending on the syntactic position of the relativized elements.

Subject and Object Relative Clauses

As analyzed before, the Mandarin Chinese relative construction comprises three essential elements: a head noun, the fixed relative element *de*, and a relative clause. As a relativized element, the head noun can be extracted from either the subject or object position within the relative clause. Extraction from the subject position results in subject relative clauses, while extraction from the object position results in object relative clauses. These structures are illustrated in (59), where the empty subject and object positions are

notated as empty categories *e*).

(59) a. na-ge [$_{Rel}$ e$_i$ du shu de] xuesheng$_i$ (Subject relative clauses)
that-CL read book DE student
'the student that read books'

b. na-ben [$_{Rel}$ Xiaoming du de e$_i$] shu$_i$ (Object relative clauses)
that-CL Xiaoming read DE book
'the book that Xiaoming reads'

Recursive and iterative constructions are available in both subject and object relative clauses. These constructions represent types of multiple embedding phenomena. The former refers to cases where the relative clause contains two or more relativized elements (head nouns), each modified by its own relative clause that is nested within another. The latter involves a single relativized element modified by two or more relative clauses, commonly known as stacking.

(60) The recursive construction

a. [[$_{RC1}$ e$_i$ baoyuan [$_{DP}$[$_{RC2}$ e$_j$ bulihui shoupiaoyuan de] siji$_j$] de]
complain ignore ticket.collector DE driver DE
chengke$_i$] zongshi dashengxuanhua
passenger always make.noise
'the passenger that complained about the driver that ignored the ticket collector is always very loud.'

b. [[$_{RC1}$[$_{DP}$[$_{RC2}$ siji baoyuan e$_i$ de] shoupiaoyuan$_i$] bulihui e$_j$ de]
driver complain DE ticket.collector ignore DE
chengke$_j$]zongshi dashengxuanhua
passenger always make.noise
'the passenger who the ticket collector who the driver complained about ignored is always very loud.' (Hsiao, 2003)

The examples cited in (60) illustrate recursive constructions in both subject relative clause (60-a) and object relative clause (60-b). In (60-a), there are two heads *chengke* 'passenger' and *siji* 'driver', both of which are extracted from subject positions. The head noun *siji* 'driver' is modified by its preceding relative clause (RC2), and their combination (DP) appears to be an object embedded in another relative clause (RC1). Since the head noun modified in RC1 is *chengke* 'passenger', this yields the final interpretation. Example (60-b) shares a similar situation as (60-a); however, the distinction is that both head nouns *chengke* 'passenger' and *shoupiaoyuan* 'ticket collector' are from object positions their respective modifying relative clauses. In addition to recursive constructions,both subject and object relative clauses also permit iterative constructions, which is shown in the following (61):

(61) The iterative construction

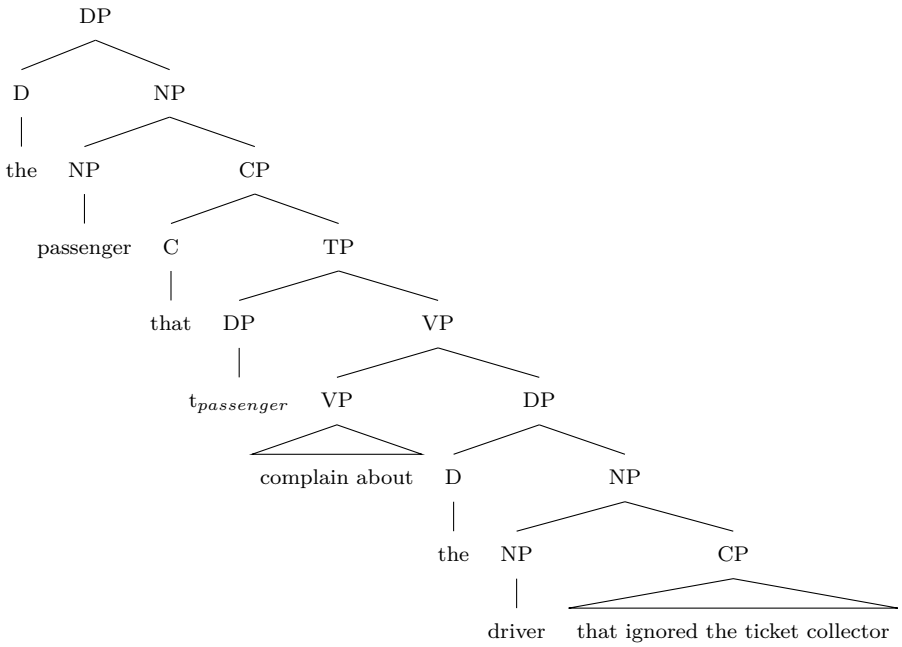
a. [[$_{RC1}$ e_i baoyuan siji de] [$_{RC2}$ e_i bulihui shoupiaoyuan de] chengke$_i$]
complain driver DE ignore ticket.collector DE passenger
zoule
leave-ASP
'the passenger that complained about the driver that ignored the ticket collector, left.'

b. [[$_{RC1}$ siji paoyuan e_i de] [$_{RC2}$ shoupiaoyuan bulihui e_i de] chengke$_i$]
driver complain DE ticket.collector ignore DE passenger
zoule
leave-ASP
'the passenger who is complained by the driver who is ignored by the ticket collector, left'

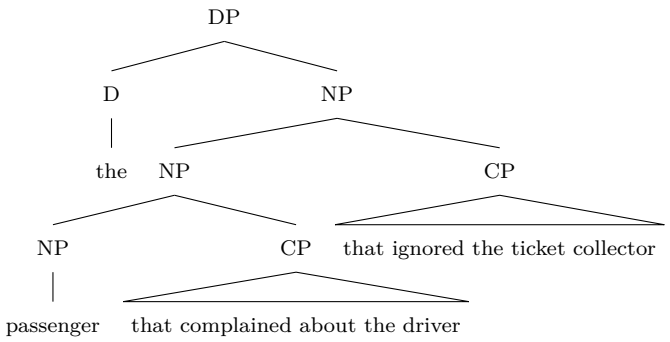
Unlike recursive constructions, iterative constructions permit only a single head noun. As shown in (61-a), the head noun *chengke* 'passenger' is simultaneously modified by two relative clauses, RC1 and RC2. The same modifying relation between the head noun and relative clauses can be found in (61-b) where the head noun *chengke* 'passenger' is from the object position instead of that from the subject position in (61-a).

Based on the above analysis, the derivation of recursive and iterative construction can be illustrated as the following (62):

(62) a. The recursive structure: [The passenger [$_{RC1}$ that complained about the driver [$_{RC2}$ that ignored the ticket collector]], is always very loud.



b. The iterative structure: [The passenger [$_{RC1}$ that complained about the driver][$_{RC2}$ that ignored the ticket collector]], left.



It is clear that the embedding clause RC2 is only able to modify its own head noun *driver*, which indicates that it can not create a relation with the higher head noun *passenger* in (62-a). In contrast, (62-b) illustrates a parallel relationship between RC1 and RC2, both of which modify the same head noun *passenger* together. These derivational structures in (62) confirms to Karlsson (2010)'s obsrvation that recursion builds a nested structure while iteration creates a flat one.

Hetzron (1978) and Sproat and Shih (1991) proposes that the relative clauses do not show the ordering preferences, which is distinct from that in the attributive adjectives where the order is up to their semantic meanings.

(63) a. the [large] [stone] building
b. *the [stone] [large] building
c. the building [that was large][that was made of stone]
d. the building [that was made of stone] [that was large] (R. Larson & Takahashi, 2007)

Comparing (63-a)(63-b) with (63-c) (63-d), it is obvious that ordering constraints are present in the former pair but absent in the latter. The unacceptability of (63-b) stems from a violation of the conventional ordering of attributive adjectives, specifically between *large* and *stone*. However, the ordering of relative clauses in Mandarin Chinese is not free according to the works of Del Gobbo (2005) and R. Larson and Takahashi (2007). In their hypothesis, the semantic distinction between stage-level (deictic) and individual-level (generic) predicates plays a crucial role in determining the order of relative clauses in cases of iterative modification.

(64) a. [[$_{RC1}$ baoyuan siji de] [$_{RC2}$ bulihui shoupiaoyuan de] chengke]
complain driver DE ignore ticket.collector DE passenger
zoule
leave-ASP
'the passenger that complained about the driver that ignored the ticket collector, left.'
b. [[$_{RC2}$ bulihui shoupiaoyuan de] [$_{RC1}$ baoyuan siji de] chengke]
ignore ticket.collector DE complain driver DE passenger

zoule
leave-ASP
'the passenger that ignored the ticket collector that complained about the driver, left.'

(65) a. [[$_{RC1}$ wo zuotian yujian de] [$_{RC2}$ cong Beijing huilai de] chengke]
I yesterday meet DE from Beijing return DE passenger
zoule
leave-ASP
'the passenger that I met yesterday that returned from Beijing, left.'

b. [[$_{RC2}$ cong Beijing huilai de] [$_{RC1}$ wo zuotian yujian de] chengke]
from Beijing return DE I yesterday met DE passenger
zoule
leave-ASP
'the passenger that returned from Beijing that I met yesterday, left.'

(66) a. [[$_{RC1}$ wo zuotian yujian de] [$_{RC2}$ bulihui shoupiaoyuan de] chengke]
I yesterday meet DE ignore ticket.collector DE passenger
zoule
leave-ASP
'the passenger that I met yesterday that ignored the ticket collector, left.'

b. *[[$_{RC2}$ bulihui shoupiaoyuan de] [$_{RC1}$ wo zuotian yujian de] chengke]
ignore ticket.collector DE I yesterday met DE passenger
zoule
leave-ASP
'the passenger that ignored the ticket collector that I met yesterday, left.'

(67) a. [[$_{RC1}$ wo zuotian yujian de] na-ge [$_{RC2}$ bulihui shoupiaoyuan de]
I yesterday meet DE that-CL ignore ticket.collector DE
chengke] zoule
passenger leave-ASP
'the passenger that I met yesterday that ignored the ticket collector, left.'

b. *[[$_{RC2}$ bulihui shoupiaoyuan de] na-ge [$_{RC1}$ wo zuotian yujian de]
ignore ticket.collector DE that-CL I yesterday met DE
chengke] zoule
passenger leave-ASP
'the passenger that ignored the ticket collector that I met yesterday, left.'

c. na-ge [[$_{RC1}$ wo zuotian yujian de] [$_{RC2}$ bulihui shoupiaoyuan de]
that-CL I yesterday meet DE ignore ticket.collector DE
chengke] zoule
passenger leave-ASP
'the passenger that I met yesterday that ignored the ticket collector, left.'

d. *na-ge [[$_{RC2}$ bulihui shoupiaoyuan de] [$_{RC1}$ wo zuotian yujian de]
that-CL ignore ticket.collector DE I yesterday met DE
chengke] zoule
passenger leave-ASP
'the passenger that ignored the ticket collector that I met yesterday, left.'

If relative clauses are at the same semantic level like both are individual-level (64) or stage-level (65), the order of relative clauses RC1 and RC2 are free in these iterative constructions. However, if RC1 is stage-level and RC2 is individual-level (66), the order is constrained: the individual relative clause must be closer to the head noun. Moreover, if the demonstrative *na-ge* 'that' co-occurs with the relative clauses RC1 (stage-level) and RC2 (individual-level) (67), the individual-level one (RC2) is still required to be closer to the head noun. Meanwhile, only the stage-level one (RC1) can precede the demonstrative.

To sum up, subject and object relative clauses are the most common types of relative constructions in Mandarin Chinese, and both permit recursive and iterative structures. However, the semantic status of relative clauses influences their orderings in iterative constructions. In addition to subject and object types, Mandarin Chinese also allows adjunct relative clauses, a distinct form of relative construction that will be explored in the following section.

Adjunct Relative Clauses

C. J. Huang et al. (2018) divides Mandarin Chinese relative clauses into two types: argument relative clauses and adjunct relative clauses. The former includes subject and object relative clauses, which have been discussed in the previous discussion. The latter will be illustrated in this section.

In adjunct relative clauses, the relativized elements (head nouns) cannot be extracted from their modifying relative clauses, as is possible in argument relative clauses. Thus, the head noun in an adjunct relative clause is actually a part of the adjunct interpretation, which indicates the eventuality of this relative clause.

(68) a. [$_{RC}$ Xiaoming gongzuo de] chengshi
Xiaoming works DE city
'the city where Xiaoming works'

b. [$_{RC}$ Xiaoming xuexi hanyu de] nage yewan
Xiaoming study Chinese DE that-Cl night
'the night when Xiaoming studied the Chinese'

c. [$_{RC}$ Xiaoming xuexi hanyu de] fangshi
Xiaoming study Chinese DE way
'the way that Xiaoming studies the Chinese'

d. [$_{RC}$ Xiaoming mei xuexi de] yuanyin
Xiaoming NEG study DE reason
'the reason why Xiaoming didn't study'

e. [$_{RC}$ Xiaoming qie shuiguo de] dao
Xiaoming cut fruit DE knife
'the knife which Xiaoming cut the fruit with'

f. [$_{RC}$ Xiaoming gen-ta$_i$ jiaotan de] na-ge ren$_i$
Xiaoming with-he talk DE that-CL person
'that person Xiaoming talked with'

g. [$_{RC}$ Xiaoming cong-nali$_i$ lai de] na-ge chengshi$_i$
Xiaoming from-there come DE that-CL city
'the city where Xiaoming came from'

h. [$_{RC}$ Xiaoming dui-ta$_i$ diantou de] na-ge nvhai$_i$
Xiaoming to-her node DE that-CL girl
'the girl whom Xiaoming nodded to'

The head nouns in these adjunct relative clauses (from (68-a) to (68-e)) refer respectively to semantic roles such as location, time, manner, reason, and instrument, each of which contributes to the interpretation of the eventuality described in the relative clause. To be specific, the head noun *chengshi* 'city' in (68-a) denotes the location where Xiaoming works; *nage yewan* 'that night' in (68-b) is the concrete time when Xiaoming studied Chinese; *fangshi* 'way' in (68-c) refers to the way manner of studying; *yuanyi* 'reason' in (68-d) explains the reason of missing the study and *dao* 'knife' specifies the instrument used to cut the fruit. Moreover, it is obvious that examples in (68-f)(68-g)(68-h) exhibit a different structural pattern, where each sentence contains both a preposition and a resumptive pronoun. In (68-f), the head noun *na-ge ren* 'that person' identifies the referent of the resumptive pronouns, which is realized due to the appearance of the preposition *gen* 'with'. (68-g) and (68-h) share the same cases. According to Ning (1993)'s definition, the former examples (from (68-a) to (68-e)) represent *gapped adjunct relatives* where no overt preposition constructions can be found, while the latter (from (68-g) to (68-h)) allowing overt prepositions and resumptives can be regarded as *PP-in-situ adjunct relatives*. These are two main types of adjunct relatives in Mandarin Chinese. Moreover, gapless relatives, which is a special type in Mandarin Chinese, have also been viewed as a variant of adjunctives in Ning (1993)'s analysis. In his idea, the adjunct relative clause contains a PP adjunct gap (the normal adjunct relatives), while the gapless relative clause includes a VP adjunct gap. This distinction will be illustrated in (69) and (70):

(69) Normal PP adjunct relative

a. zhe jiu shi [Xiaoming deng Xiaoli de che]
this exactly be Xiaoming wait Xiaoli DE car
'this is the car where Xiaoming waited Xiaoli.'

b. Xiaoming [$_{PPAdjunct}$ zai che shang] deng Xiaoli
Xiaoming in car inside wait Xiaoli
'Xiaoming waited Xiaoli in the car.'

(70) Gapless VP adjunct relative

a. zhe jiu shi [Xiaoli kai dian de qian]
this exactly be Xiaoli open store DE money
'this is the money that Xiaoli got from opening the store.'

b. Xiaoli kai dian [$_{VPAdjunct}$ zheng qian]
Xiaoli open store earn money

'Xiaoli made money by opening the store'

Examples (69) and (70) reflect how the PP adjunct *zai che shang* 'in car' and the VP adjunct *zheng qian* 'earn money' appear in sentences after and before relativization.

In all, Mandarin Chinese imposes no categorical restrictions on the position of relativized elements. It suggests that relativized elements can be in subject, object, and adjunct positions. The following section will explore the strategies of relativization applied in Mandarin Chinese.

3.3.6 Strategies of Relativization in Mandarin Chinese

The preceding sections aim to build a basic understanding of Mandarin Chinese relative constructions by analyzing the fixed relative element *de* and classifying various types of relative constructions from different levels. The following sections will shift focus to specific relativization strategies in Mandarin Chinese, which will further clarifyr the relation among the three essential elements: the relative clause, the relative element *de*, and the head noun.

As discussed before, relative pronouns, gaps, and resumptive pronouns are the three most commonly used strategies in relativization. Thus, this section will examine the distribution and applicability of these strategies in Mandarin Chinese.

No Relative Pronoun

Although the identity of *de* (the only fixed relative element in Mandarin Chinese) raises disputation, it is widely accepted that *de* does not exhibit the properties of relative pronouns (Aoun & Li, 2003; Del Gobbo, 2010; C. J. Huang et al., 2018; Ning, 1993). Moreover, Aoun and Li (2003) and C. J. Huang et al. (2018) suggest that some wh-forms in Mandarin Chinese behave as in-situ relative pronouns, directly predicating the head noun without undergoing syntactic movement.

(71) a. [ta weishenme$_i$ bu lai de] yuanyin$_i$
he why not come DE reason
'the reason why he didn't come'

b. [ta ruhe$_i$/zenme$_i$ xiu che de] fangfa$_i$
he how fix car DE method
'the way how he fixed the car'

c. *[ni kandao shei$_i$ mama de] xiaohai$_i$
you see who mother DE child
'the child whose mother you saw'

d. [*ni zai shenmeshihou$_i$ lai de] shihou$_i$
you at what.time come DE time
'the time when you came at what time' (C. J. Huang et al., 2018)

In (71-a), the wh-form *weishenme* 'why' refers to the head noun *yuanyin* 'reason', and *ruhe/zenme* 'how' in (71-b) denotes the head *fangfa* 'way'. These contrast with other wh-forms shown in (71-c) and (71-d), where *shei* 'who' and *shenmeshihou* 'when' are not allowed in relative clauses. Cinque (2020) regards the co-occurrence of relative pronouns with invariant relativizers in Mandarin Chinese as a behavior of non-contiguity with head nouns. C. J. Huang et al. (2018) defines these wh-elements as *resumptive wh-words*, proposing that they represent a distinct relativization strategy. The key properties of these resumptive wh-words are summarized in ((72)) below.

(72) a. zhe jiu shi [women yiwei [ta weishenme$_i$ mei lai] de] yuanyin$_i$
this exactly is we thought he why not come DE reason
'this is the reason$_i$ why$_i$ we thought he did not come t$_i$'

b. *zhe jiu shi [[[ruguo ta weishenme$_i$ shengqi] wo hui bu gaoxing] de] yuanyin$_i$
this exactly is if he why angry I will not happy DE reason
'this is the reason I will not be happy if he gets angry why.'

According to C. J. Huang et al. (2018)'s analysis, resumptive wh-words in Mandarin Chinese relative clauses are able to establish a relation with head nouns across clause boundaries, but being sensitive to islands. Thus, *weishenme* 'why' refers to the head noun *yuanyin* 'reason' successfully in (72-a) but fails to be connected to the head noun in (72-b) due to the block of the island. It is obvious that these base-generated *resumptive wh-words* exhibit distinct behavior from genuine wh-pronouns in relative clauses, and they must co-occur with the fixed relative element *de*. Therefore, their presence in Mandarin Chinese does not violate the hypothesis made by De Vries (2002) that pre-nominal relative clauses tend to lack relative pronouns. Furthermore, the absence of interrogative wh-elements in relativization strongly suggests the presence of a covert relative operator in Mandarin Chinese relative clauses.

(73) a. I heard the reason$_i$ [why$_i$ he would not come here e$_i$]

b. *[ni weishenme jiao shei xiu che] de yuanyin]?
you why ask whom fix car DE reason
'the reason you asked whom to fix the car'

c. [ni weishenme jiao ta xiu che] de yuanyin
you why ask him fix car DE reason
'the reason you asked him to fix the car'

Example (73-a) is the usage of the interrogative wh-pronoun *why* in English relative clauses, where the relative clause is derived via movement of a relative operator equivalent to *why*. Comparing (73-b) with (73-c), the interrogative *shei* 'who' triggers the violation in (73-b). As an interrogative, *shei* 'who' requires to be interpreted in the matrix clause

to make a question by being related to an operator. If there is a relative operator in the peripheral position of the relative clause, the dependency between *shei* 'who' and the question operator in the matrix clause is obstructed. This violation arises due to the Minimality Condition (Chomsky, 2014), which stipulates that operator movement must target the closest potential landing site. Thus, Mandarin Chinese relative clauses ought to follow an underlying structure that is captured in (74):

(74) [Op$_i$ ni weishenme$_i$ jiao ta xiu che] de yuanyin$_i$
you why ask him fix car DE reason
'the reason you asked him to fix the car'

To sum up, the available wh-words in Mandarin Chinese relative clauses can only be base-generated, which requires the obligatory existence of *de*. Due to this property, wh-words such as *weishenme* 'why' and *ruhe/zenme* 'how' should be distinguished from typical wh-pronouns like *which, who, or what* used in English relativization. These Mandarin wh-words do not undergo movement and thus do not function as relative operators in the same way. Instead, Mandarin Chinese predominantly relies on the gap strategy in relativization, which will be examined in detail in the following section.

Presence of Gap

The previous chapter claims that the gap strategy can be divided into two cases: one involving gaps with relative pronouns, and the other involving gaps with overt or silent invariant relativizers. According to Cinque (2020)'s *double-headed* hypothesis, the former corresponds to a partial matching of the two heads while the latter reflects full matching. The gap strategy used in the derivation of Mandarin Chinese relative clauses reflects the full matching type, as it consistently co-occurs with the overt invariant relativizer *de*.

Following the above discussion, it is obvious that gaps can appear in all types of Mandarin Chinese relative clauses: the subject one, the object one, and even the adjunct one.

(75) a. na-ge [$_{RC}$ t$_i$ du shu de] xuesheng$_i$ (Subject relative clauses)
that-CL read book DE student
'the student that read books'

b. na-ben [$_{RC}$ Xiaoming du de t$_i$] shu$_i$ (Object relative clauses)
that-CL Xiaoming read DE book
'the book that Xiaoming reads'

c. [$_{RC}$ Xiaoming t$_i$ qie shuiguo de] dao$_i$ (Adjunct relative clauses)
Xiaoming cut fruit DE knife
'the knife which Xiaoming cut the fruit with'

In (75), the trace marked as *t* is to represent the gap within the relative clause. The head nouns *xuesheng* 'student' *shu* 'book' *dao* 'knife' are able to be interpreted at the

gap positions within their respective modifying relative clauses, which reflects the reconstruction effect. Apart from the gap strategy, resumptive pronouns can also be observed in Mandarin Chinese relative clauses. The next section will examine the distribution of resumptive pronouns in the derivation of Mandarin Chinese relative clauses, which is distinct from that of gaps.

Presence of Resumptive Pronoun

Different from the gap strategy, the presence of resumptive pronouns serves to compensate for the mismatch between external and internal Heads under the *double-Headed* hypothesis where the internal Head is larger than the external one.

Resumptive pronouns are also available in Mandarin Chinese relative clauses, but their distribution exhibits specific constraints. The presence of resumptive pronouns in Mandarin Chinese relative clauses is optional in the cases without islands, which suggests that gaps can be free alternatives to resumptive pronouns in certain positions.

(76) a. (zhe jiu shi) [$_{RC}$ t_i (ta_i) yiding hui lai de] na-wei xuesheng$_i$
(this exactly be) (3MSg) certainly Fut come DE that-Cl student
'this is the student that will certainly come'

b. zhe jiu shi [$_{RC}$ Xiaoming hui jian-dao t_i (ta_i) de] na-ge ren$_i$
this exactly be Xiaoming Fut see.ASP (3MSg) DE that-Cl person
'this is the person that Xiaoming will see'

The examples shown in (76) reflect the optionality of the resumptive pronoun *ta* 'him/her' in Mandarin Chinese relative clauses without islands. *ta* 'he/she' and the gap *t* are in the subject position in (76-a), while in (76-b) they occupy the direct object position. In the same island-free construction, English and Arabic relative clauses display contrasting behaviors regarding the presence of resumptive pronouns.

(77) the boy [$_{RC}$ that I love (*him)]

(78) gaabaltu rajul-an [$_{RC}$ ʔarifu-hu] (Arabic)
met.1sm man-ACC knew.1SM-him
'I met a man that I knew' (Alotaibi & Borsley, 2013)

In English (77), the resumptive pronoun *him* is not allowed in the direct object position of the relative clause. Conversely, in Arabic (78), the resumptive pronoun *hu* 'him' relating to the head noun *rajul* 'man' is obligatory and its omission would result in ungrammaticality. It is evident that, unlike Mandarin Chinese, the use of resumptive pronouns in English and Arabic relative clauses does not exhibit the same degree of optionality under comparable syntactic conditions. However, the optionality of resumptive pronouns in Mandarin Chinese is subject to certain constraints. Specifically, relative clauses must be definite for resumptive pronouns to appear. In Mandarin Chinese, the demonstrative *zhe*

'this' and *na* 'that' are used to express the definiteness meaning. The lack of a demonstrative in (76-a) is acceptable due to the reason that Mandarin Chinese is a topic-prominent language, allowing nominal expressions in subject position to be interpreted as definite by default. Thus, demonstratives can be omitted in (76-a) rather than in (76-b). Moreover, the distribution and acceptability of optional resumptive pronouns in Mandarin Chinese depend highly on the verbs and subjects within the relative clauses.

(79) a. zhe jiu shi [$_{RC}$ (*ta$_i$) shenghuo zai xiaozheng de] na-wei funv$_i$
this exactly be 3FSg live in town DE that-Cl lady
'this is the lady who lives in the town'

b. zhe jiu shi [$_{RC}$ laoshi-men xihuan (*ta$_i$) de] na-ge xuesheng$_i$
this exactly be teacher-Pl like 3SG DE that-Cl student
'this is the student that the teachers like'

Comparing the examples in (79) with those in (76), it is clear that all the resumptive pronouns are in island-free constructions. However, unlike the optional resumptive pronouns observed in (76), those in (79) are ungrammatical. Pan (2016) concludes that the optional use of resumptive pronouns in Mandarin Chinese is constrained by certain semantic and syntactic factors. Specifically, when the resumptive pronoun occupies the subject position, the extracted subject must not be the experiencer of the predicate. Similarly, when the resumptive pronoun appears in the direct object position, the verb must not be stative or psychological in nature. Thus, the extracted subject *funv* 'lady' in (79-a) is the experiencer of the predicate *shenghuo* 'live', which disallows the resumptive pronoun *ta* 'she' in the original subject position. Also, the verb *xihuan* 'like' is psy verb, which blocks the possibility of resumptive pronoun *ta* 'him/her' in the object position.

Despite the optional use of resumptive pronouns in Mandarin Chinese relative clauses, their presence tends to become obligatory when a preposition is involved within the relative clause.

(80) a. zhe jiu shi [$_{RC}$ Xiaoming song *(ta$_i$) hua de] na-wei nvsheng$_i$
this exactly be Xiaoming give her flower DE that-Cl girl
'this is the girl to whom Xiaoming gives the book'

b. zhe jiu shi [$_{RC}$ Xiaoming dui *(ta$_i$) diantou de] na-ge nvhai$_i$
this exactly be Xiaoming to her node DE that-CL girl
'this is the girl to whom Xiaoming nodded to'

In contrast to (76), the resumptive pronoun *ta* 'her' in (80) is obligatory. The resumptive pronoun *ta* 'her' in (80-a) is in the indirect object of the preposition, while it occupies the direct object of the preposition in (80-b). According to the idea post by C.-T. J. Huang (1998) that Mandarin Chinese disallows the preposition stranding in either relativization or topicalization (as shown in (81)), the obligatory existence of resumptive pronoun in relative clauses can be explained as a way to prevent sentences from violating

this constrain.

(81) a. ∗ Chengshi$_i$, Xiaoming [$_{PP}$ cong t$_i$] hui xiaozheng (Topicalization)
city Xiaoming from come-back town
'Xiaoming came back to the town from the city'

b. ∗ [$_{RC}$ Xiaoming [$_{PP}$ cong t$_i$] hui xiaozheng de] chengshi$_i$
Xiaoming from come-back town DE city
(Relativization)

'Xiaoming came back to the town from the city'

Pan (2016) and Rouveret (2011) suggest that resumptive pronouns tend to be obligatory in genitive constructions when both preposition stranding and preposition pied-piping are disallowed in a given language. Similar to Mandarin Chinese relative clauses, languages such as Welsh and Hausa also reflect this property, where resumptive pronouns are required, as illustrated in (82):

(82) a. y dyn yr oedd *(ei) fam gartref (Welsh)
the man that was his mother at.home
'the man whose mother was at home'

b. waa ka karanta littafi *(nsa) (Hausa)
who 2SgM read book his
'whose book did you read' (Pan, 2016)

As shown in (82-a), the noun *fam* 'mother' is not able to be extracted together with the possessor *yr* 'that'. In this case, the insertion of the resumptive pronoun *ei* 'his' rescues the sentence. A similar pattern can be found in (82-b), where the appearance of the resumptive pronoun *nsa* 'his' prevents a violation.

The above discussion illustrates that resumptive pronouns in Mandarin Chinese relative clauses serve a crucial role in constructions involving prepositions. However, their presence can not save sentences from strong island violations in relativization.

(83) a. ∗ zhe shi [$_{RC1}$ wo jiandao-guo [$_{RC2}$ tanlun-guo ta$_i$ de] na-ge
this be 1Sg meet-ASP talk-ASP 3MSg DE that-Cl
nvtongxue de] zuojia$_i$
female.student DE writer
this is the writer [whom I met the student [who talked about (him)]] (Pan, 2016)

b. This is the girl$_i$ [$_{RC}$ who I read in the New York Times yesterday] [$_{RC1}$ that the awful man [$_{RC2}$ who raped *(her)] had escaped from prison]. (Erteschik-Shir, 1992)

In the Mandarin Chinese relative clause cited in (83-a), the head noun *zuojia* 'writer' is not allowed to be extracted from the CP island (RC2), which will violate the Subjacency.

It is obvious that the resumptive pronoun *ta* 'him' does not rescue the island effects. On the opposite, the existence of resumptive pronoun *her* in English (83-b) blocks the locality condition and makes the relative construction grammatical.

In all, the resumptive pronouns are available in Mandarin Chinese relative clauses, and their existence is constrained by factors such as definiteness, verb type, and the semantic role of the subject. While they are functional in constructions involving prepositions, they cannot rescue violations caused by strong islands. A separate chapter will be set for resumptive pronouns to analyze their derivation and cross-linguistic properties within relative clauses.

In this section, I focus on four key aspects in the derivation of Mandarin Chinese relative clauses : the fixed relative element *de*; the semantic/syntactic typology; the position of relativization; and the strategies of relativization. With this foundational understanding in place, the next section will turn to a more detailed analysis of the derivational mechanisms underlying Mandarin Chinese relative clauses.

3.4 Analysis of Relative Clauses in Mandarin Chinese

In the literature, the analyzing approaches of Mandarin Chinese relative clauses can be divided into three main types, which are *the operator movement approach, the raising approach, and the matching approach*. However, a unified analysis of Mandarin Chinese relative clauses is still lacking due to their specialties. It suggests that no single approach among these three is sufficient to cover the derivation of all Mandarin Chinese relative clauses. Cinque's *double-headed* hypothesis proposes to build a single unified structure for all relative clauses, may offer a promising framework. if it is on the right track, it should also be applicable to the derivation of Mandarin Chinese relative clauses. The following part provides an overview of these approaches.

3.4.1 The Operator Movement Approach

In nature, the operator movement approach is developed from the standard theory analyzed in the previous chapter. Chomsky et al. (1977) proposes that relative constructions in most languages are derived from wh-movement. This proposal is built upon three main assumptions, outlined in (84):

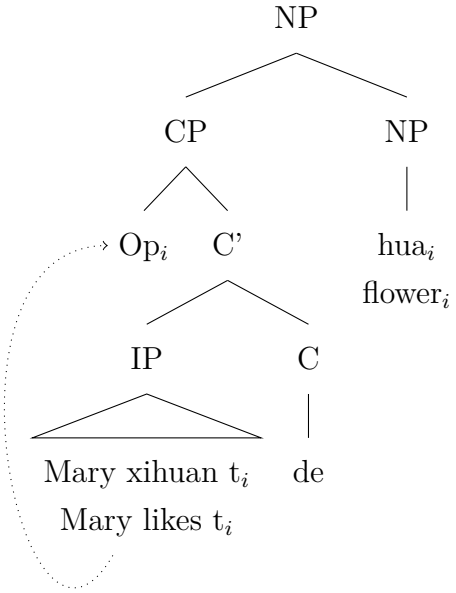
(84) a. the head noun is base-generated outside the relative clause (CP);
b. the relativizer is merged originally inside the relative clause and undergoes wh-movement to the Spec, CP position;

c. the head noun and the wh-phrase are linked through a co-indexation mechanism;

Following Chomsky et al. (1977)'s hypothesis, Ning (1993) regards the derivation of Mandarin Chinese relative clauses as a representation of the operator movement. In his hypothesis, the fixed relative element *de* is a kind of functional Head that combines with the relative clause to form an operator-variable construction. Moreover, he confirms the existence of a covert relative operator (Op) in Mandarin relative clauses. This operator originates within the relative clause and moves to the Spec, CP position. The following is an illustration of this derivation approach.

(85) a. [$_{CP}$ Op$_i$ [$_{C'}$ [Mary xihuan t$_i$][$_C$de]] hua$_i$]
Mary like DE flower
'the flower that Mary likes'

b.



As shown above in (85), the fixed relative element *de* is the functional head C with an IP as its complement. The complement (IP) is right to *de*; thus, this ordering follows the pre-nominal structure of Mandarin relative clauses. The covert operator (Op) raises from the position within the relative clause (marked as *t*) to Spec,CP. It is obvious that the externally originated head noun *hua* 'flower' does not undergo movement and therefore lacks a direct syntactic relation with the trace *t*. The connection between them is established via co-indexation. Specifically, movement creates a binding relationship between the trace and the operator, allowing the operator to mediate the link between the head noun *hua* 'flower' and the trace *t*. If this is on the right track, Mandarin Chinese relative clauses should be subject to island constraints, in line with canonical wh-dependencies.

(86) a. *[$_{CP}$ [$_{IP}$ t_i de-le jiang] shi jian hao shi de] na-ge ren$_i$
get-ASP prize be CL good matter DE that-CL man
'the man it is great for to get the prize' (Ning, 1993)

b. *[$_{CP}$ [$_{IP}$ wo jiandao-guo [$_{IP}$ tanlun-guo t_i de] na-ge nvtongxue de]
1Sg meet-ASP talk-ASP DE that-Cl female.student DE
zuojia$_i$
writer
this is the writer [whom I met the student [who talked about (him)]] (Pan, 2016)

c. *[$_{CP}$ ta [$_{Adjunct}$ [$_{P}$ gen] [t_i]] tiaowu de] guniang$_i$
he with dance DE girl
'the girl he dance with' (Ning, 1993)

The unacceptable sentences cited in (86) reflect that Mandarin Chinese relative clauses are constrained by the sentential subject (86-a), the complex NP (86-b), and adjunct conditions (86-c), respectively. These provide compelling evidence for movement-based derivations in relativization.

(87) [$_{CP}$ [$_{IP}$ ni weishenme$_i$ jiao ta xiu che] de yuanyin$_i$
you why ask him fix car DE reason
'the reason you asked him to fix the car'

Reviewing the case in (87) (previously cited as (74)), the existence of the wh-word word *weishenme* 'why' in the Mandarin Chinese relative clause can be taken as evidence supporting an operator movement analysis. In this case, the head noun *yuanyin* 'reason' does not undergo reconstruction, which suggests that movement does not target the head noun position directly.

The operator movement approach blocks the binding relation between the head noun and the variable inside the relative clause. However, reconstruction effects are attested in certain cases, where the head noun appears to be interpreted within the relative clause. This suggests that the operator approach is not able to cover all types of relative clauses in Mandarin Chinese, thereby highlighting its empirical limitations. The next part illustrates another derivation approach applied to Mandarin Chinese relative clauses, namely the *raising* approach.

3.4.2 The *Raising* Approach

Based on previous analyses supporting the head raising approach in the derivation of relative clauses, similar trace patterns can also be found in Mandarin Chinese.

(88) a. wo rang Xiaoming gaosu [$_{RC}$ mei-ge-ren$_i$ kai lai t$_j$ de] [ziji$_i$ de chezi]$_j$
I ask Xiaoming tell every-Cl-one drive come DE self DE car
'Self's car that I asked Xiaoming to tell everyone to drive over'

b. [$_{RC}$ ta chi t$_i$ de] cu$_i$ bi shui dou duo
he drink DE vinegar compare who all more
'lit: The vinegar he drinks is more than anyone else's'
'His jealousy is greater than anyone else's'

c. wo zhidao [$_{RC}$ mei-ge-ren xihuan t$_i$ de] [san-ben shu]$_i$
I know every-Cl-one like DE three-Cl book
'I know the three books that everyone likes' ($\forall \geq$ three)

(88) provides evidence for the head raising analysis in Mandarin Chinese relative clauses, as it illustrates reconstruction effects, idiomatic interpretation, and scope assignment, respectively. In (88-a), *ziji* 'self' is the reflexive which requires to be bound by the quantificational noun *mei-ge-ren* 'everyone', suggesting that *ziji* 'self' originates within the relative clause. Example (88-b) demonstrates an idiomatic interpretation, where the head noun *cu* 'vinegar' requires to be a part of the idiom *chi cu* 'drink vinegar'; otherwise, the idiomatic meaning cannot be derived. Moreover, (88-c) provides further support for the head raising hrough scope interpretation. The preferred reading is that *for each one x, I know a (possibly different) group of three books x likes* which requires the head noun *san-ben-shu* 'three books' to be interpreted inside the relative clause.

These observations provides the plausibility of the raising approach in the derivation of Mandarin Chinese relative clauses. In the literature, two main versions of the raising analysis have been proposed. One is regarding Mandarin Chinese relative clauses as complementation structures (Simpson, 2002), while the other is to analyzes them as NP adjunctions (Aoun & Li, 2003; C. J. Huang et al., 2018). The following part will compare these two raising approaches with regard to the derivation of Mandarin Chinese relative clauses.

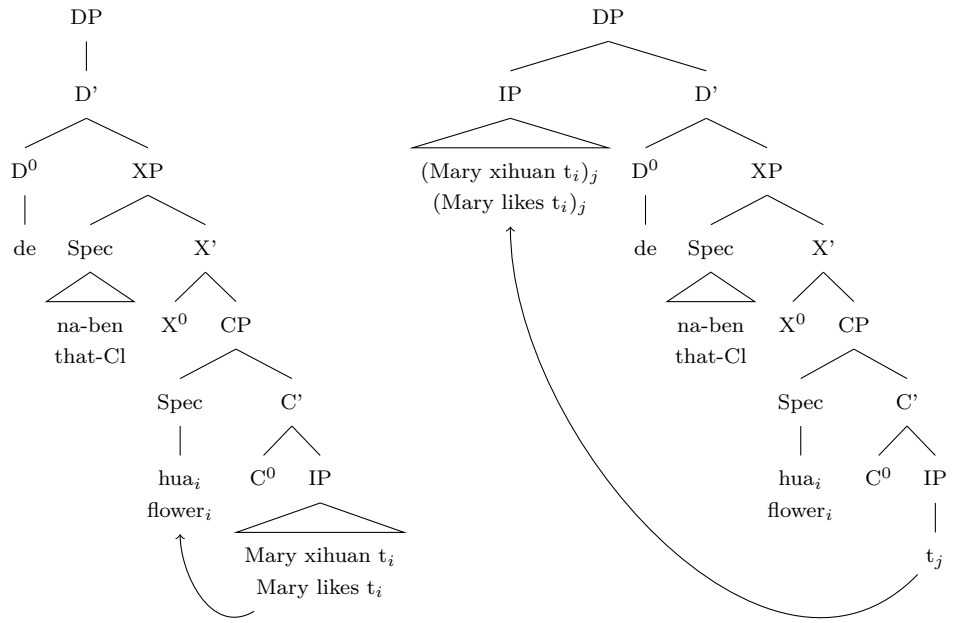
In the early section of this chapter, where the classification of *de* has been discussed, the proposal by Simpson (2002) was introduced, in which the fixed relative element *de* is analyzed as a determiner in Mandarin Chinese relative clauses. Based on this idea, Simpson (2002) extends his analysis to the derivation of Mandarin Chinese relative clauses, which is sketched in (89).

(89) a. [$_{DP}$ [$_D$ de [na-duo [$_{CP}$ Mary xihuan hua]

b. [$_{DP}$ [$_D$ de [na-duo [$_{CP}$ hua$_i$ [$_{C'}$ C^0 [$_{IP}$ Mary xihuan t$_i$]

c. [$_{DP}$ [$_{IP}$ Mary xihuan t$_i$]$_j$ [$_D$ de [na-duo [$_{CP}$ hua$_i$ t$_j$]]]
Mary like DE that-Cl flower
'the flower that Mary likes'

d.



Simpson (2002) argues that the surface structure of (89-c) is derived from an underlying head-initial configuration, as shown in (89-a), through a two-step derivational process. Firstly, the noun *hua* 'flower' moves out of the IP *Mary xihuan hua* 'Mary likes flower' to the Spec,CP position, leaving a trace t_i within the IP (seen in (89-b) and (89-c)). Then, the remnant of IP raises to Spec,DP to conform to the pre-nominal structure characteristic of Mandarin Chinese relative clauses (seen in (89-c) and (89-c)). In his hypothesis, the determiner *de* is originated in a higher position than that hosting the demonstrative-numeral-classifier group (base-generated in Spec,XP). It is obvious that Simpson (2002) follows Kayne (1994)'s idea that the relative clause is the complementation of the head noun. However, Aoun and Li (2003) and C. J. Huang et al. (2018) suppose that Mandarin relative clauses are derived via NP adjunction, with the relative clause left-adjoined to the head noun. Moreover, they deny the determiner status of *de*, claiming that Mandarin relative constructions should be analyzed as NPs rather than DPs, thereby challenging the view that *de* functions as a determiner.

(90) a. *He is an [[$_{RC1}$ actor that wants to do everything] and [$_{RC2}$ producer that wants to please everyone]].

b. He is [[$_{RC1}$ an actor that wants to do everything] and [$_{RC2}$ a producer that wants to please everyone]]. (C. J. Huang et al., 2018)

In constructions where relative clauses occur with conjunctions, Longobardi (2008) hypothesizes that the obligatory appearance of a determiner indicates that the conjoined item can only be a DP. The contrast between (90-a) and (90-b) illustrates this hypothesis: the lack of the determiner *a* in (90-a) renders the second relative clause (RC2) an

NP, which leads to ungrammaticality. However, Mandarin Chinese relative clauses seem to behave differently, which allows relative clauses to be NPs even within coordinated structures. Mandarin Chinese employs a variety of conjunctions, among which *jian, he, gen,erqie* 'and' are the most commonly used .Their usage in coordinating relative clauses is illustrated in the following (91):

(91) a. ta shi yi-ge [siji **jian/*he/*gen/*erqie** baoan]
he is one-Cl driver and security
'he is a driver and security'

b. wo renshi [[yi-ge siji] **he/gen/*jian/*erqie** [yi-ge baoan]]
I know one-Cl driver and one-Cl security
'I know a driver and a security'

c. wo xinshang [[zhe-ge siji] **he/gen/*jian/*erqie** [na-ge baoan]]
I appreciate this-Cl driver and that-Cl security
'I appreciate this driver and that security'

d. [[wo xihuan Mary] **erqie/*jian/*he/*gen** [ta ye xihuan Mary]]
I like Mary and he also like Mary
'I like Mary and he also likes Mary'

The sentences from (91-a) to (91-d) illustrate how different categories of conjoined elements influence the selection of conjunctions in Mandarin Chinese. It is clear that *jian* 'and' is used to connect two NPs, as shown in (91-a) [5]. In contrast, *he* and *gen* 'and' are employed in the coordination of DPs, as observed in (91-b) and (91-c). Meanwhile, *erqie* 'and' plays its function in connecting non-nominal categories (91-d). To be specific, *jian* 'and' requires the conjoined properties to denote one single individual, while *he/gen* 'and' allow for the coordination of separate individuals. Based on this observation, it can be hypothesized that the type of conjunction reflects the syntactic category of the conjoined elements in Mandarin Chinese. Considering the example demonstrated in the following (92):

(92) wo xiang zhao yi-ge [[fuze Yingwen de mishu] **jian/*he/*gen/*erqie**
I want find one-Cl charge English DE secretary and
[jiao xiaohai de jiajiao]]
teach kid DE tutor
'I want to find a secretary that takes care of English (matters) and tutor that teaches kids.'

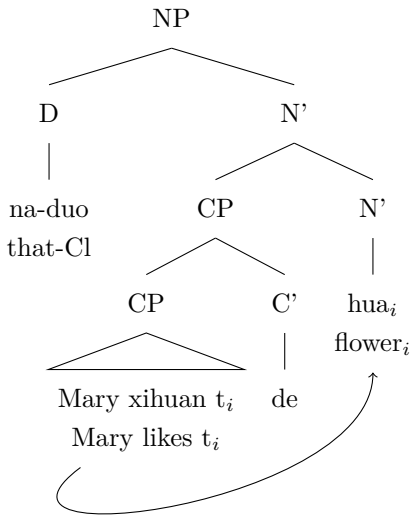
As shown in (92), the only acceptable conjunction is *jian* 'and'. This phenomenon suggests that conjunction in Mandarin relative constructions can be created between NPs. According to Simpson (2002)'s idea, the fixed *de* functions as a determiner in Mandarin Chinese

[5] A typical nominal expression in Mandarin Chinese can be expressed as [$_{DP}$ Demonstrative[$_{NumP}$ Number [$_{CIP}$ Classifier[$_{NP}$ N]]]]. Here, *yi-ge* 'one-Cl' is a form of number and classifier which functions as an indefinite determiner in English, while *zhe-ge, na-ge* 'this-Cl' 'that-Cl' works as definite expressions. For further discussion, see C. J. Huang et al. (2018) Chapter 8

relative clauses. If it is on the right track, the DP conjunction *he/gen* 'and' instead of the NP conjunction *jian* 'and' should be available here due to the strict DP requirement of Mandarin Chinese relative construction. Moreover, if denying the determiner status of *de* and regarding it as a complementizer to follow the structure [$_{DP}$ D CP] advocated by Kayne (1994)'s raising hypothesis, the CP conjunction *erqie* 'and' ought to be possible. However, the fact is on the opposite. Based on this case, Aoun and Li (2003) propose that the structure of Mandarin Chinese relative clauses ought to be [$_{NP}$ CP NP] considering that Mandarin Chinese does not reflect a close dependence between a determiner and a relative clause like that in English. The derivation of this NP-adjunction structure is shown in (93).

(93) a. [Mary xihuan t$_i$ de] na-duo hua$_i$
Mary like DE that-Cl flower
'the flower that Mary likes'

b.



As shown in (93), the head noun *hua* 'flower' originates within the CP and undergoes NP movement to the N position. In this derivation, the fixed *de* is a base-generated complementizer, and the Mandarin Chinese relative clause follows the head-final construction.

This section introduces two types of raising approach applied in Mandarin Chinese relative clauses, one is regarding the relative clause as a complementation of the head noun while the other adopts an adjunction analysis. The reconstruction effect, idiom interpretation and scope assignment prove the plausibility of the raising approach in the derivation of Mandarin Chinese relative clauses. however, some evidence shows that the matching analysis seems to also be possible. The next section will focus on the application of the matching approach to Mandarin Chinese relative clauses.

3.4.3 The *Matching* Approach

As analyzed before, the matching approach, which supports non-movement in the process of relativization, serves as a counterpart to the raising approach. According to the matching analysis, two instances of the relativized noun are present: one is within the relative clause, and the other is outside it. Through a process known as relative deletion, one of these nouns is deleted, leaving the overt head noun. In Mandarin Chinese relative clauses, there is evidence suggesting that the head noun does not undergo movement necessarily, which supports the plausibility of the matching approach.

(94) a. [$_{CP}$ wo xiwang [$_{CP}$ ta$_i$ zhao [$_{NP}$ [$_{CP}$neng zhaogu ziji$_{i/j}$ de] [$_{NP}$
I want her find can take.care.of self DE
zhangfu $_j$]]]]
husband
'I want her to find a husband that can take care of her/himself'

b. [[$_{CP}$ wo xiwang ta$_i$ zhao de] [$_{NP}$[$_{CP}$ neng zhaogu ziji$_{*i/j}$ de] [$_{NP}$
I want her find DE can take.care.of self DE
zhangfu$_j$]]]
husband
'the husband that can take care of himself that I want her to find' (Y. Xu, 2009)

The contrast set in (94) proves that reconstruction of the head noun is not obligatory in all cases. (94-a) reflects the ambiguity of the Mandarin Chinese relative construction where the reflexive *ziji* 'self' can refer either to the pronoun *ta* 'her' or the noun *zhangfu* 'husband'. If reconstruction of an anaphor is possible, then the reflexive *ziji* 'self' in (94-b) should also be able to stand for the pronoun *ta* 'her'. However, this referential relation does not show in (94-b). If the matching approach is applied here, the failure in creating this referential relation would be reasonable due to the covert head noun (the deleted one) blocks the reflexive *ziji* 'self' to be c-commanded by the higher anaphor *ta* 'her'. Thus, the lack of reconstruction provides support for the matching analysis. Importantly, evidence for the matching derivation extends beyond anaphor reconstruction to scope assignment as well.

(95) a. wo zhidao [$_{RC}$ mei-ge-ren xihuan t$_i$ de] [san-ben-shu]$_i$
I know every-Cl-one like DE three-Cl-book
'I know the three books that everyone likes' ($\forall \geq$ three)

b. wo zhidao [$_{RC}$ mei-gei-ren **dou** hui xihuan de] [san-ben-shu]
I know every-Cl-one all will like DE three-Cl-book
'the three books that everyone will like' (*$\forall \geq$ three)

Comparing (95-a) ((88-c) repeated here as (95-a)) with (95-b), it is obvious that *mei-ge-ren* 'everyone' within the relative clause cannot take scope over the head noun *san-ben-shu*

'book' in (95-b). This scope assignment challenges the raising analysis of relative clauses, as the head noun *shu* 'book' no longer needs to be interpreted within the relative clause. The presence of *dou* 'all' in (95-b), which is absent in (95-a), plays a critical role in this contrast. This suggests that reconstruction for scope interpretation in Mandarin Chinese relative clauses is sensitive to the presence or absence of *dou* 'all'. Aoun and Li (2003) and Aoun et al. (1993) assumes that if the head noun of a relative clause is a QP in Mandarin Chinese, it cannot reconstruct to interact with another QP inside the relative clause. They first highlight the domain requirements imposed on *dou* 'all' and its related QP by comparing the following examples (96):

(96) a. [[$_{RC}$ mei-ge-ren xie t de] wenzhang] dou hen you yisi
every-Cl-one write DE article all very have interest
'the articles that everyone wrote are all interesting'

b. [[$_{RC}$ t xie mei-ge-ren de] wenzhang] dou hen you yisi
write every-Cl-one DE article all very have interest
'the articles that described everyone are all interesting'

c. wo kan-le [[$_{RC}$ mei-ge-ren dou xie de] wenzhang]
I read-ASP every-Cl-one all write DE article
'I read the article that everyone wrote'

In (96-a), the QP *mei-ge-ren* everyone occupies the subject position, while in (96-b), it appears in the object position. The difference is that a group reading is obligatory in (96-b) but not in (96-a). A plausible explanation is that the QP *mei-ge-ren* 'everyone' is required to be within the government domain of *dou* 'all'. In subject position, *mei-ge-ren* everyone can move out of the relative clause and land in the government domain of *dou* 'all'. Thus, the QP *mei-ge-ren* 'everyone' in (96-a) can take scope over the head noun *wenzhang* 'article'. However, if *mei-ge-ren* 'everyone' is in the object position, this movement is not permitted, which causes the obligatory group reading in (96-b). This locality set on the raising of QP also explains the unavailability of wide scope for *mei-ge-ren* 'everyone' in (96-c) where it cannot take scope over the head noun *wenzhang* 'article'. Then, the difference in interpretation between the two sentences in (95) can be explained by this domain rule. In (95-b), the subject QP *mei-ge-ren* 'everyone' cannot raise out of the relative clause due to the presence of *dou* 'all', which blocks it from moving to a position where it could c-command the QP *san-ben* 'three-Cl' in the complex head noun *san-ben-shu* 'three books'. In this case, the QP *mei-ge-ren* 'everyone' fails to take scope over the head noun *san-ben-shu* 'three books'. However, (95-b) is free from this constraint set by the domain requirement due to the lack of *dou* 'all', thus the subject QP *mei-ge-ren* 'everyone' can take wider scope than *san-ben-shu* 'three books'. From this analysis, it is clear that the raising of a complex head noun (with a QP) is blocked if the relative clause contains another QP and *de* 'all'.

With respect to idiom interpretation, there is also evidence supporting the base-

generated analysis of head nouns in Mandarin Chinese relative clauses.

(97) a. [$_{RC}$ ta chi t_i de] cu_i bi shui dou duo
he drink DE vinegar compare who all more
'lit: The vinegar he drinks is more than anyone else's'
'His jealousy is greater than anyone else's'

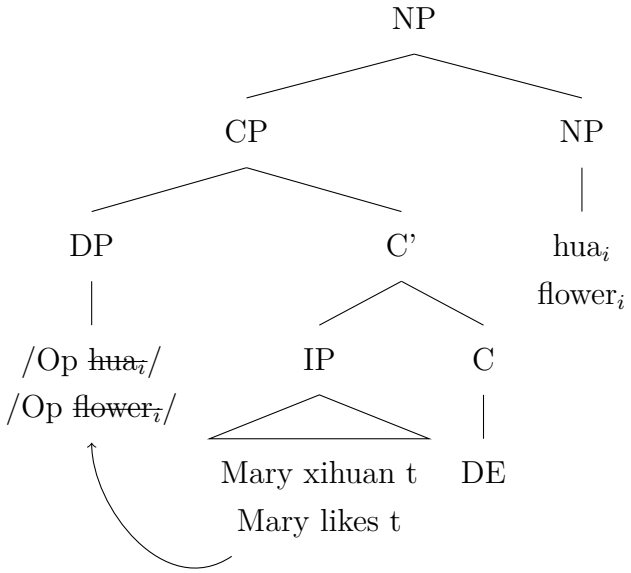
b. ta laoshi ai chi [[$_{RC}$ rang ren shou-bu-liao de] cu]
he always like drink let people receive-not-complete DE vinegar
'lit: he always likes to drink vinegar that cannot be put up with'
'he always likes to be jealous to such a degree that is beyond what can be put up with'

As analyzed before, the idiom interpretation of (97-a) ((88-b) repeated as (97-a)) suggests that the head noun *cu* 'vinegar' is raised from within relative clause. However, the idiom cited in (97-b) denotes that the head noun *cu* 'vinegar' is interpreted with respect to the matrix clause, making it unavailable for interpretation within the relative clause. In this case, the matching analysis should be applied here, as it allows the head noun to be base-generated outside the relative clause.

By re-analyzing reconstruction effects, scope assignment, and idiom interpretation, it is clear that Mandarin Chinese relative clauses permit the relativized noun to be base-generated. This supports the viability of the matching approach in accounting for their derivation.

(98) a. [$_{NP}$ [$_{CP}$ ~~hua$_i$~~ Mary xihuan t de] hua_i]
Mary like DE flower
'the flower that Mary like'

b.



According to Carlson (1977) and Sauerland (1998)'s analysis of matching cases in English relative clauses discussed before, the picture of Mandarin Chinese ones can be similarly

represented, as illustrated in (98). In this structure, there are two instances of the head noun *hua* 'flower': one external to the CP and one internal. The inside head noun moves along with a null operator OP to Spec,CP, then is deleted due to the same identity of the external one.

In summary, reconstruction effects, scope assignment, and idiom interpretation cannot always be positive evidence supporting the raising approach for Mandarin Chinese relative clauses, which provides the possibility for the matching analysis. In this case, Aoun and Li (2003) and C. J. Huang et al. (2018) suggest that the derivation of Mandarin Chinese relative clauses should be examined on a case-by-case basis. The next section will explore how Mandarin Chinese relative clauses can be classified according to their choice of relativization strategy (raising or matching).

3.4.4 The Mix Approach

According to the previous analysis, both gaps and resumptive pronouns are strategies used in the derivation of Mandarin Chinese relative clauses. Based on this point, Aoun and Li (2003) argue that these two strategies actually represent two distinct approaches to relativization. Relative clauses containing a gap are derived via head movement, while the existence of a resumptive pronoun indicates that the head noun is base-generated [6].

(99) a. *wo xiang kan [[ni shuo meigeren$_j$ hui dai **ta**$_i$ huilai de] [wo yijing
I want see you say everyone will bring him back DE I already
jieshao gei ta$_j$ de pengyou]$_i$]
introduce to him DE friend
'I want to see the friend that I have introduced to him that you said everyone would bring back'

b. wo xiang kan [[ni shuo meigeren$_j$ hui dai **t**$_i$ huilai de] [wo yijing
I want see you say everyone will bring back DE I already
jieshao gei ta$_j$ de pengyou]$_i$]
introduce to him DE friend
'I want to see the friend that I have introduced to him that you said everyone would bring back'

The examples cited in (99) illustrate reconstruction of relativized nouns in Mandarin Chinese relative clauses. In (99-a), the pronoun *ta* 'him' occupies the position where the head noun *wo yijing jieshao gei ta de pengyou* 'the friend that I have introduced to him' is interpreted within the relative clause. The unacceptability of (99-a) suggests that reconstruction of the head noun is not available here. If reconstruction does not happen, which means the pronoun *ta* 'him' has the other index instead of the head noun,

[6] Aoun and Li (2003) also admits the existence of gapless relative clauses in Mandarin Chinese. However, they propose that such constructions are not true relative clauses, but rather arguments of the head noun. In this work, I set aside these gapless constructions.

the sentence will be rescued from the violation. (99-b) reflects the case where the gap t replacing the resumptive pronoun *ta* 'him', and the sentence is clearly grammatical. The assumption can be made that the existence of a resumptive pronoun blocks the possibility of a raising approach. Moreover, Aoun and Li (2003) argues that the base-generation of the head noun in relative clauses with resumptive pronouns is further supported by cases where the resumptive occurs inside syntactic islands, which is shown in (100).

(100) wo xiang kan [na-ge [ni [yinwei ta$_i$ bu hui lai] hen shengqi de]
I want see that-Cl you because he not will come very angry DE
[xuesheng]$_i$]
student
'I want to see the student that you are angry because he would not come'

If the raising approach is applied in (100), the head noun *xuesheng* 'student' will be required to move out of the relative clause, leaving a pronoun in its original position. It is clear that the resumptive pronoun *ta* 'him' is within the island, which suggests the head noun *xuesheng* 'student' can only be base-generated instead of being moved out from this position to derive the relative clause. Therefore, Aoun and Li (2003) concludes the relativization of Mandarin Chinese as the following (101):

(101) a. [[$_{CP}$[$_{IP}$...[t$_i$]...]][$_{Head}$ NP]$_i$]
b. [[$_{CP}$ Op$_i$ [$_{IP}$...[pronoun$_i$]...]][$_{Head}$ NP]$_i$]

As illustrated in (101), the derivation of Mandarin Chinese relative clauses can be divided into two cases. (101-a) is the application of the raising approach, which is employed when a gap is present, while (101-b) represents the matching approach, which applies when a resumptive pronoun occurs.

The existence of a resumptive pronoun serves as a criterion for determining the relativization approach in Mandarin Chinese in Aoun and Li (2003)'s proposal. However, this criterion has limitations as resumptive pronouns derive either from base-generation or movement. Following his proposal, resumptive pronouns can only be base-generated in Mandarin Chinese. To prove the plausibility of this assumption, a more detailed investigation is needed. While I set aside the analysis of resumptive pronouns for a later chapter, I now turn to Cinque (2020)'s double-Headed hypothesis of relative clauses. The double-Headed hypothesis aims to create a single unified structure for all cases in relativization; if it is on the right track, it should also apply to Mandarin Chinese relative structures. Thus, I will introduce how to make a unified analysis of Mandarin Chinese relative clauses by applying this double-Headed structure.

3.4.5 Cinque's idea of Mandarin Chinese Relative Clauses

In Cinque (2020)'s analysis, Mandarin Chinese relative clauses are argued to be most plausibly treated as a type of non-finite/participial relative clause.

As analyzed in the previous section, Mandarin Chinese relative clauses can appear in two distinct positions: before the demonstrative (RC1) or between the classifier and the noun (RC2). This distribution is illustrated in the following (102):

(102) RC1-Demonstrative-Numeral-Classifier-RC2-Noun

Although the existence and nature of non-restrictive relative clauses in Mandarin Chinese is still confusing, the position between the classifier and the noun (RC2) is considered the most plausible site for non-restrictive interpretations. This is based on the observation that relative clauses appearing before the demonstrative (RC1) are reliably interpreted as restrictive. Given that non-restrictive relative clauses in Mandarin Chinese are confined to the post-demonstrative position, Cinque (2020) argues that Mandarin Chinese relative clauses share three properties with English participial relative clauses.

(103) a. Her [$_{RC}$ recently deceased] father.

b. I only met the [$_{RC}$ newly appointed] colleague, not the others.

c. na (yi)-ge [$_{RC}$ ta xihuan de] haizi
that one-CL he like DE child
'the child that he likes'

d. [$_{RC}$ hen ai chi niupai de] Laowang jintian que dian-le yupai
very love eat beef-steak DE Laowang today but order-Asp fish-steak
'(To our surprise), Laowang, who loves eating steak very much, ordered fish steak today'

The examples cited in (103) demonstrate that the interpretation of post-demonstrative relative clauses in Mandarin Chinese (RC2) parallels that of post-numeral participial relatives in English. (103-a) is the non-restrictive interpretation of English participial relatives, while the interpretation of (103-b) is restrictive. Similarly, Mandarin Chinese relative clauses in the post-numeral position can be interpreted as either restrictive (seen in (103-c)) or non-restrictive (seen in (103-d)).

Different from finite relative clauses, Mandarin Chinese relative clauses are subject to a kind of ordering restriction. Recall the example (66):

(104) a. [[$_{RC1}$ wo zuotian yujian de] [$_{RC2}$ bulihui shoupiaoyuan de] chengke]
I yesterday meet DE ignore ticket.collector DE passenger
zoule
leave-ASP
'the passenger that I met yesterday that ignored the ticket collector, left.'

b. *[[$_{RC2}$ bulihui shoupiaoyuan de] [$_{RC1}$ wo zuotian yujian de] chengke]
ignore ticket.collector DE I yesterday met DE passenger
zoule
leave-ASP
'the passenger that ignored the ticket collector that I met yesterday, left.'

As seen in (104) ((66) repeated here as (104)), the individual-level RC2 is required to be closer to the head noun *chengke* 'passenger' than the stage-level RC1. R. Larson and Takahashi (2007) argues that a similar ordering requirement is found in English, but crucially, this constraint applies to attributive modifiers rather than finite relative clauses. This distinction is illustrated in (105) below:

(105) a. the [large] [stone] building
b. *the [stone] [large] building
c. the building [that was large] [that was made of stone].
d. the building [that was made of stone] [that was large].

It is obvious that the stage-level modifier *large* is disallowed to be closer to the noun *building* than the individual-level modifier *stone*. In contrast,the grammaticality of (105-d) suggests that such ordering constraints do not apply to English finite relative clauses. This contrast proves the hypothesis of Cinque (2020) that Mandarin Chinese relative clauses pattern more closely with participial relative clauses than with finite ones. Moreover, post-demonstrative Mandarin Chinese relatives can be closer to the noun than the adjectives, a distributional property also found in English participial relatives.

(106) a. na-zuo [$_{Adj}$ pojiu de] [$_{RC}$ renmen zao yi yiqi de] simiao
that-CL old DE people early already abandon DE temple
'the old temple that people have already abandoned.'
b. *Mary tried to interview every candidate [$_{RC}$ that she liked] [$_{Adj}$ possible]
c. that [$_{Adj}$ beautiful] [$_{RC}$ recently arrived] letter

As shown in (106-a), the noun *simiao* 'temple' is modified by both the adjective *pojiu-de* 'old' and the relative clause *renmen zao yi yiqi de* 'people already abandon', with the relative clause appearing as the closest modifier to the noun. In contrast, this ordering is ungrammatical in English finite relative clauses, as shown in (106-b). However, when the relative clause is participial, as in (106-c), the same modifier order found in Mandarin Chinese becomes acceptable in English. This parallel in modifier ordering and the possibility of non-restrictive interpretation further supports Cinque (2020)s hypothesis that Mandarin Chinese relative clauses are structurally akin to participial relatives.

While Cinque (2020)'s participial analysis captures important aspects of Mandarin relative clause behavior, certain properties distinguish Mandarin Chinese relative clauses from standard participial structures. These distinctive features are summarized in (107)

below:

(107) a. the existence of invariant relativizer *de*
b. the existence of overt subjects
c. verbs in relative clauses are not participles
d. the existence of tense and aspect markers
e. the lack of participle inflections
f. they are unbounded and show sensitivity to islands

Based on (107), the following will provide further explanation. From the previous analysis, the confirmed point is that *de* is obligatory in all types of Mandarin Chinese relative clauses, distinguishing them from participle relatives. The second point is that the participial relative tends to lack the higher clausal layers like the IP and CP layer, which is regarded as a reduced form of relative clauses. Applying Cinque (2020)'s double-headed hypothesis here, PRO is the possible candidate for the internal head within the participial relative.

(108) a. the $[_{RC}$ PRO_i recently appointed $t_i]$ $professor_i$
b. $[_{RC}$ Xiaoming xihuan t_i de] $jiaoshou_i$
Xiaoming like DE professor
'the professor that Xiaoming likes'

(108-a)

is the example of an English participial relative clause, where PRO is the subject of the relative clause, which builds the co-indexation relation with the head noun *professor*. However, the head noun *jiaoshou* 'professor' has its trace within the relative clause, which suggests that it is base-generated within the relative clause and then moves out. This structural distinction demonstrates that Mandarin Chinese relative clauses are derived differently from English participial relatives. Thenthe lack of participle inflections in Mandarin Chinese verbs directly causes verbs are impossible to be participles in relative constructions.

(109) a. wo mai de shu
I buy DE book
'the book that I bought'
b. wo mai guo de shu
I buy ASP DE book
'the book that I bought'
c. wo zhengzai mai de shu
I ASP buy DE book
'the book that I am buying'

In (109), *guo* and *zhengzai*, as tense and aspect markers, indicating Mandarin Chinese relative clauses behave like full finite clauses.

Furthermore, Mandarin Chinese relative clauses are unbounded and show sensitivity to islands unlike the participial relative clauses.

(110) a. zhe jiu shi [[ta renwei [$_{RC}$ ni yinggai t$_i$ zuo zhejian shi de]]
this exactly be he think you should do this-CL work DE
fangfa$_i$]
way
'this is the way that he thinks you should do this work'

b. *the [person [[$_{RC}$ playing the music] you heard]] used to be my teacher.

c. *zhe jiu shi [[$_{RC1}$ [[$_{RC2}$ ta xihuan [t$_i$ zuo zhejian shi] de] ren] de]
this exactly be he like do this-CL work DE person DE
fangfa$_i$]
way
'this is the way that he likes the person that does the work'

d. the [[$_{RC2}$ recently arrived] person] [$_{RC1}$ that opened the door].

In (110), two comparison pairs are presented. (110-a) demonstrates that Mandarin Chinese relative clauses can be unbounded, while the English participial relative clause in (110-b) is the opposite. The ungrammaticality of the Mandarin Chinese relative clause (110-c) is caused by the failure of extracting the head noun *fangfa* 'way' from the CP island (RC2). However, this violation does not happen in English (110-d), where the movement of head noun *person* is not restricted by the participial relative clause RC2.

In many languages, participial relative clauses modify nouns using participles, which are verb-derived adjectives that function as reduced relative clauses. Based on the above analysis, it can be deduced that Mandarin Chinese does not have true participial relative clauses. In this case, it is much more plausible to regard the Mandarin Chinese relative clauses as a kind of relative clauses with unique properties instead of viewing them as a simple reduced one (non-finite/participial relative clauses).

3.5 Conclusion

This chapter offers an overview of Mandarin Chinese relative constructions and emphasizes their specialties in relativization.

At the outset, two fundamental points in the analysis of Mandarin Chinese relative clauses have been established. First, Mandarin Chinese relative clauses refer to cases where *de* links verbs or dependent clauses to nouns, distinguishing them from other *de* constructions. Second, Mandarin Chinese relative clauses can only be DPs. The use of NP coordinators in Mandarin relative clauses indicates that NPs can be formed within a DP, particularly when the relative clauses modify the same entity with multiple roles.

The analysis of then extends to the three essential elements in relativization: the head noun, the relative clause, and the fixed relative element *de*. There is still no confirmed opinion of the classification of *de*. L. L. S. Cheng (1986), Chiu (1993), Ning (1993), and Waltraud (2007) regard *de* as a complementizer, while Paris (1979) and N. Zhang et al. (1999) highlight its nominalization function played in relativization. Meanwhile, Simpson (2002) and Simpson and Wu (2002) defines *de* as a determiner. In this chapter, I adopt the hypothesis that *de* is a head-initial complementizer in Mandarin Chinese relative constructions, based on its subordinating functions and its capacity to trigger movement and recursion. Afterwards„ the ordering between the relative clause and other modifiers has been illustrated. Mandarin Chinese relative clauses can be either pre-demonstrative or post-demonstrative. In the post-demonstrative position, the relative clause may receive an appositive interpretation. This is followed by an analysis of relativization positions in Mandarin Chinese, confirming the existence of adjunct relative clauses. Additionally, the distribution of gaps and resumptive pronouns is discussed, both of which serve as strategies for relativization.

In the literature, the *raising* and *matching* approaches are commonly used in analyzing the derivation of Mandarin Chinese relative clauses. Reconstruction effects, idiom interpretation, and scope assignment all provide support for the *raising* approach. However, this evidence occasionally yields conflicting results, which may instead point toward a preference for the matching approach. The preliminary hypothesis is that Mandarin Chinese relative clauses can be derived from either raising or matching. In this case, Cinque (2020)'s double-headed structure shows its advantage in unifying the analysis of Mandarin Chinese relative clauses. However, Cinque (2020) classifies Mandarin Chinese relative clauses as non-finite/participial ones based on the presence of PRO as the internal head, which raises certain challenges. The overt subject and the obligatory presence of the relative marker *de* in Mandarin Chinese relative clauses pose problems for this hypothesis. Furthermore, the unboundedness of Chinese relative clauses and their sensitivity to syntactic islands further distinguish them from reduced (participial) relative clauses. Additionally, the absence of participial morphology in Mandarin Chinese precludes the existence of true participial relative clauses.

Through the analysis of this chapter, it is evident that Mandarin Chinese relative clauses show their specialties in their interpretation of appositives and their distribution of resumptive pronouns. These features merit deeper investigation. The subsequent chapters will focus on these two topics in detail. Beginning with Mandarin Chinese data, the analysis will then broaden to a cross-linguistic perspective, thereby facilitating a more comprehensive understanding of relative constructions in general.

Chapter 4

Appositive Relative Clauses

4.1 Introduction

According to semantic typology, relative clauses can be restrictive, non-restrictive (appositive), amount (maximalizing), or kind-defining. The criteria for this classification has been discussed in Chapter 2, and the examples are repeated in (1) as a reminder.

(1) a. The students [$_{RC}$ that failed the text on syntax]. (restrictive)
b. The students, [$_{RC}$ who failed the test on syntax]. (non-restrictive)
c. I took with me the books [$_{RC}$ (that) there were on the table]. (amount/maximalizing)
d. He's the kind of guy [$_{RC}$ that (he) gets into a lot of fights]. (kind-defining)

In (1-a), the students only refer to those who failed the text, excluding who passed. By contrst, all students who failed or passed the text have been mentioned in (1-b). (1-c) conveys that all books on the table have been taken away. The relative clause shown in (1-d) is not able to define the head noun *guy* but instead adds extra information , indicating a non-restrictive reading.

This chapter focuses on non-restrictive relative clauses, examining their properties, classifications, and analytical approaches. Moreover, Mandarin Chinese appositive relative constructions reflect distinctive characteristics in terms of antecedent categories, illocutionary independency, split antecedents, and binding relations, which challenges cross-linguistic generalizations about appositive relatives. As mentioned in the previous chapter, Cinque (2020) views Mandarin Chinese relatives as participial (non-finite) relative clauses, which denies the possibility of appositive relative constructions. Through comparison with other forms of appositive relatives, I propose that Mandarin Chinese appositive relative clauses are actually a type of fully-integrated appositives. If this is on the right track, it provides new insights into the typology of appositive relative clauses. The following sections present a detailed examination of appositive relative constructions.

4.2 The Properties of Appositive Relative Clauses

In the literature, the analysis of appositive (non-restrictive) relative clauses is always together with restrictive ones due to the structural similarities they share. This section contains a comparative analysis of appositive and restrictive relatives, aiming to clearly delineate the distinctions between them. The selection of antecedents and the choice of relative elements are two discussed points in this comparison. A detailed analysis of each is presented in the following parts.

4.2.1 Antecedent

Appositive and restrictive relatives behave differently in their selection of antecedents. Two key distinguishing features are the definiteness and the syntactic category of the antecedents.

Definite or Indefinite

Definite and indefinite antecedents can be found in both appositive or restrictive relative clauses. However, when an indefinite antecedent occurs in an appositive relative clause, it must be interpreted as specific. This specificity requirement does not apply in restrictive relative clauses.

(2) a. The/*Some person, who wore a red hat.
b. The/Some person that wore a red coat.
c. A tutor will register each student, who is then responsible for getting his papers to the Dean's office on time.

As shown in (2), the quantifier *some* is not allowed in the appositive relative clause (2-a) since it makes the antecedent *person* generic. However, the quantified antecedent *some person* is not forbidden in the restrictive relative (2-b). (2-c) reflects that the indefinite antecedent *a tutor* is acceptable in the appositive relative. According to the sentence, *a tutor* refers to the one who registers the student. In this case, the antecedent *a tutor* is specified and is able to license the appositive relative

The following part is another difference concerning antecedents, which is their syntactic category in relativization.

Category

Although the antecedents of appositive relatives are constrained by indefiniteness, they exhibit a wider range of syntactic categories. Unlike restrictive relative clauses, appositive relatives can take not only noun phrases but also prepositions, adjectives, adverbs, verbs, and clauses as their antecedents. This variety is illustrated in the following (3):

(3) a. Peter put it [$_{PP}$ under the table], where I had put it earlier.
b. Bill is [$_{AP}$ drunk] all the time, which is probably how you'd like to be.
c. John answered the question [$_{AdvP}$ politely], which I thought was how he should have answered it.
d. John luckily [$_{VP}$ escaped], which I unluckily didn't.
e. [$_{CP}$ The cheese was bought by John], which was fortunate. (Fabb, 1990)

Nominal expressions are the only acceptable antecedents in restrictive relative clauses. Due to the defining function of restrictive relatives, their antecedents cannot be unique ones.

(4) a. [$_{DP}$ The man/John], who wore a red hat.
b. [$_{DP}$ The man/*John] who wore a red hat.

Comparing the examples cited in (4), both the appositive (4-a) and the restrictive (4-b) relative can take nominals (DP) as antecedents. However, the name *John* is not allowed as the antecedent in the restrictive one (4-b) since it has already been defined which leads to vacuous quantification . In contrast, the function of the appositive relative is to add extra information to the antecedent without altering its reference. Therefore, the DP *John* is available in (4-a). The next part will turn to the relative elements applied in restrictive and non-restrictive relative clauses to compare the differences between these two types of relative constructions.

4.2.2 Relative Complementizer or Relative Pronoun

As discussed in the previous chapter, relative complementizers and relative pronouns are two types of relative elements essential for relativization. According to Jackendoff (1977)'s analysis, appositives can only be introduced by relative pronouns.

(5) a. The man, who/*that/*∅ Bill saw, sneezed.
b. The man who/ that/ ∅ Bill saw sneezed.

In the examples cited in (5), (5-a) illustrates an appositive relative clause, which does not permit either the overt complementizer *that* or the silent one ∅ to make the relativization. In this case, the only accessible relative element is the relative pronoun *who*. In contrast, the restrictive relative clause (5-b) does not show such limitation: the relative complementizer *that*, the silent ∅ and the relative pronoun *who* are all allowable. However, Fabb (1990) suggests that although the relative pronoun can exist in restrictive relative clauses, it cannot be contained in a phrase. This is demonstrated in the following example (6):

(6) a. The man, the mother of whom I met yesterday, is a French speaker.

b. *The man the mother of whom I met yesterday is a French speaker.

In the appositive relative (6-a), the relative pronoun *whom* can be embedded and forms the phrase *the mother of whom*. However, embedding the relative pronoun *whom* will lead to ungrammaticality in the restrictive relative clause (6-b). The reference issue causes this difference between appositive and restrictive relative clauses. In the restrictive relative clause, the relative pronoun *whom* occupies the specifier position of the relative clause. According to the Spec-head agreement, *the mother of whom* requires the referential index of *man*. However, the relative pronoun *whom* must share the same referential index as *man*, this results in semantic incoherence due to conflicting referents. This indexing incompatibility will not arise in the appositive relative clause where *the mother of whom* is not coindexed with the antecedent since there is no predication. Thus, the relative pronoun *whom* can share an index with *man*.

C. Lehmann (1984) and R. J. Smits (2019) suggest that the restriction on relative complementizers in appositive relatives is not universal; it appears to be a language-specific feature of English.

(7) a. Inviterò anche Giorgio, [$_{RC}$ **che** abita qui vicino]. (Italian)
invite.1SG.FUT also Giorgio that lives here close
'I will invite also Giorgio, who lives nearby.' (Cinque, 2008)

b. Ma soeur, [$_{RC}$ **que** le magistrat avait convoquée pour le lendemain],... (French)
my sister whom the magistrate had summoned for the next.day
'My sister, who the magistrate had summoned for the next day,...' (Cinque, 1982)

c. A Ana, [$_{RC}$ **que** está sempre a chatear-me] não me escreve. (Portuguese)
the Ana who is always to annoy-me not me writes
'Ana, who always annoys me, doesn't write me' (Rinke & ASSmann, 2017)

The above examples shown in (7) demonstrate that relative complementizers can introduce appositive relative clauses. Unlike English, where the relative complementizer *that* is excluded from appositive relatives, languages such as Italian (7-a) (che), French (7-b) (que), and Portuguese (que) allow relative complementizers in appositive constructions. This cross-linguistic variation indicates that the type of relativizer (relative pronoun or complementizer) should not be considered a reliable criterion for distinguishing between appositive and restrictive relative clauses.

This section has focused on two key elements of relativization: the antecedent and the relativizer. Appositive relatives are generally restricted to definite antecedents but show flexibility in terms of category, allowing a broader range of antecedent types than restrictive relatives. In contrast, restrictive relatives impose fewer constraints on definite-

ness but limit the category of permissible antecedents. As for relativizers, no consistent difference emerges between appositive and restrictive relatives across languages.

After analyzing the basic properties of appositive relatives, the next section will move on to the classification of their different types.

4.3 Cinque's Classification of Appositive Relative Clauses

As a distinct subtype of relative clauses, appositive relative clauses behave differently from restrictive relatives and other constructions. Cinque (2008) focuses on analyzing the distinctions among appositive relatives. In his proposal, appositive relative clauses can be divided into two types: integrated and non-integrated. Moreover, they can be further classified according to syntactic typology into externally headed post-nominal, externally headed pre-nominal, internally-headed, double-headed, and correlative appositive relative clauses. The former classification highlights differences in syntactic properties, and the latter focuses on variations in syntactic typology. In this section, both classification approaches will be illustrated.

4.3.1 Two Types of Appositive Relative Clauses: Integrated or Non-Integrated

Considering that Italian appositive relatives (the *che/cui* and *il quale* appositive relative) have distinct syntactic properties, thus Cinque (2008) targets Italian relatives to make a universal classification of appositive relatives.[1] According to the option of relativizer, Italian appositive relatives can be divided into two types: one is introduced by the complementizer *che/cui*, and the other is introduced by the relative pronoun *il quale*. The distinction between these two appositive relatives is shown in the following part.

(8) a. Se Carlo$_i$ non amava più Anna$_j$, i quali$_{i,j}$ d'altra parte non
if Carlo not love any-longer Anna who of-other side not
si erano mai voluti veramente bene, una ragione c'era.
Recipr. were ever wanted really well a reason there.was
'if Carlo was no longer in love with Anna, who never really loved each other at any rate, there was a reason'

b. *Se Carlo$_i$ non amava più Anna$_j$, che$_{i,j}$ d'altra parte non si
if Carlo not love any-longer Anna that of-other side not Recipr.
erano mai voluti veramente bene, una ragione c'era.
were ever wanted really well a reason there was

[1]Here, only the syntactic properties have been introduced. Illocutionary dependence and the potential for occurrence across discourse, which relate to the level of pragmatics have not been explained. More details can be seen in the work of Cinque (2008).

lit: 'if Carlo was no longer in love with Anna, who never really loved each other at any rate, there was a reason' (Adapted from Cinque, 2008)

Two appositive relatives are provided for comparison in (8). It is evident that the relative pronoun *i quali* in (8-a) can refer to either *Carlo* or *Anna*, while this is not allowed in the appositive relative (8-b) introduced by the relative complementizer *che*. This phenomenon suggests that the *il quale* instead of the *che* appositive can have split antecedents.

(9) a. Se quel farmaco, il quale farmaco è il frutto di molti anni di lavoro,
if that medicine which medicine is the result of many years of work
non è stato messo in commercio, una ragione ci devessere.
not has been put on market a reason there must.be
'if that medicine, which medicine is the result of many years work, was non-commercialized, there must be a reason'

b. *Se quel farmaco, che farmaco è il frutto di molti anni di lavoro, non
if that medicine that medicine is the result of many years of work not
è stato messo in commercio, una ragione ci devessere.
has been put on market a reason there must.be
lit:'if that medicine, which medicine is the result of many years work, was non-commercialized, there must be a reason' (Adapted from Cinque, 2008)

As shown in (9), the head noun *farmaco* 'medicine' can be fully retained in the *il quale* appositive relative (9-a). However, the ungrammaticality of the appositive relative in (9-b) suggests that this full retention of the head noun is forbidden in the *che* appositive relative clause.

(10) Ha raggiunto la fama con *Il giardino dei Finzi-Contini*, il quale romanzo
He reach-up the fame with *Il giardinodei Finzi-Contini* which novel
ha poi anche avuto una riduzione cinematografica.
have then also had a reduction cinematic
'He became famous with *Il giardinodei Finzi-Contini*, which novel was then also made into a film' (Adapted from Cinque, 2008)

The example in (10) suggests that the head nouns appearing in the *il quale* are not required to share the same identity. As shown in the previous example in (9), full retention of the head noun is allowed in the *il quale* relative clause. In (10), the remaining head noun, *romanzo* 'novel', does not represent the same identity as the head noun *Il giardino dei Finzi-Contini*.

(11) a. Maria è suscettibile. La qual cosa sua sorella di certo non è.
Maria is touchy which thing her sister of sure not is
'Maria is touchy. Which thing her sister certainly is not.'

b. *Maria è suscettibile. Che sua sorella di certo non è.
Maria is touchy that.thing her sister of sure not is

lit:'Maria is touchy. That thing her sister certainly is not.'

c. Maria interveniva sempre. La qual cosa faceva anche sua madre.
Maria intervened always which what did also her mother
'Maria was always speaking up. Which her mother also used to do.'

d. *Maria interveniva sempre. Che faceva anche sua madre.
Maria intervened always that did also her mother
lit: 'Maria was always speaking up. That her mother also used to do.'
(Adapted from Cinque, 2008)

The examples in (11) indicate that the *la quale* appositive relative clause does not set strict restrictions on the category of antecedents, which contrasts with the *che* appositive relative. The *la quale* appositive relatives can take an AP such as *Maria è suscettibile* 'Maria is touchy' (11-a) and a VP such as *Maria interveniva sempre* 'Maria was always speaking up' (11-c) as their antecedents. However, the ungrammaticality of (11-b) and (11-d) suggests that neither an AP nor a VP can serve as the antecedent for the *che* appositive relative. Reviewing the examples shown in (8), it seems that the antecedent of the *che* appositive relative can only be nominal. Moreover, the *che* appositive relative requires the relative complementizer *che* to be adjacent to the antecedent, while this requirement is not present in the *la quale* appositive relative.

(12) a. Da quando i russi se ne sono andati, i quali non si
from when the Russians if they are gone who not Recipr.they
erano mai veramente integrati con la popolazione, la pace è
were never really integrated with there population there peace is
finita.
over
'Since the Russians left, who had never really mixed with the population, there is no more peace.'

b. *Da quando i russi se ne sono andati, che non si erano
from when the Russians if they are gone that not Recipr.they were
mai veramente integrati con la popolazione, la pace è finita.
never really integrated with there population there peace is over
'Since the Russians left, who had never really mixed with the population, there is no more peace' (Adapted from Cinque, 2008)

As shown in (12), the verb *andati* 'left' is between the antecedent *russi* and the relative relative element —*la quale* in (12-a) and the complementizer che in (12-b) . The ungrammaticality of (12-b) indicates that the insertion of the verb *andati* 'left' blocks the interpretation of the *che* appositive relative. In contrast, this insertion does not interfere with the interpretation of the *la quale* relative. Although the *che* appositive relative is restricted by the category and position of its antecedent, it permits reflexive antecedents, which are otherwise disallowed in the *la quale* appositive relative. This contrast is illustrated in the examples provided in (13):

(13) a. Facendo questo rovinerà anche se stesso$_i$, che$_i$ non avrebbe
doing this he-will-ruin also self he that not would-have
certo bisogno di altre disgrazie.
certainly need of other misfortunes
'by doing this he will also ruin himself, that would certainly not need another blow now.'

b. *Facendo questo rovinerà anche se stesso$_i$, il quale$_i$ non avrebbe
doing this he-will-ruin also self he who not would-have
certo bisogno di altre disgrazie.
certainly need of other misfortunes
lit:'by doing this he will also ruin himself, who would certainly not need another blow now' (Adapted from Cinque, 2008)

The reflexive *stesso* 'himself' can be the antecedent of the *che* appositive relative (13-a) instead of the *la quale* one (13-b).

(14) a. *Una persona$_i$ che i Rossi, i quali conoscono e$_i$ bene, hanno
a person that the Rossis who they-know well they-have
sempre ammirato t$_i$ è Gianni.
always admire is Gianni
lit:'One person who the Rossis, who know well, have always admired is Gianni'

b. ?Una persona$_i$ che i Rossi, che conoscono e$_i$ bene, hanno sempre
a person that the Rossis that they-know well they-have always
ammirato t$_i$ è Gianni.
admire is Gianni
'One person that the Rossis, who know well, have always admired is Gianni' (Adapted from Cinque, 2008)

The examples in (14) illustrate the distribution of parasitic gaps in Italian appositive relative clauses. The parasitic gap is not allowed to appear in the *la quale* appositive relative (14-a), while its trace can be found in the *che* appositive (14-b).

(15) a. Gianni e Mario, tra le rispettive consorti e i quali non
Gianni and Mario between their respective spouses and who not
cera mai stato un grande affiatamento, ...
there-was never state a great fellowship
'Gianni and Mario, between their respective wives and whom there never was a real understanding...

b. *Gianni e Mario, tra le rispettive consorti e cui non
Gianni and Mario between their respective spouses and who not
cera mai stato un grande affiatamento, ...
there-was never state a great fellowship
lit:'Gianni and Mario, between their respective wives and whom there never was a real understanding, ... (Adapted from Cinque, 2008)

As mentioned, *la quale* and *cui/che* belong to different word classes. The former functions as a relative pronoun and can be coordinated with the DP *tra le rispettive consorti* 'between their respective' in the appositive relative clauses (15-a). In contrast, *che* functions as a relative complementizer which cannot be coordinated with any other DPs (15-b).

According to the analysis above, the properties of *la quale* and *cui/che* appositive relative clauses can be summarized as the following (16):

(16) The properties of *la quale* appositive relative clauses

a. the possibility of split antecedents
b. the retention of head nouns is possible
c. no identity of overt heads
d. the category of the antecedents is not limited by DPs
e. no adjacency requirements
f. no reflexive antecedents
g. no parasitic gaps

(17) The properties of *cui/che* appositive relaitve clauses

a. the impossibility of split antecedents
b. the retention of head nouns is impossible
c. the same identity of overt heads is obligatory
d. the category of the antecedents can only be DPs
e. the requirement of adjacency
f. the possibility of reflexive antecedents
g. the possibility of parasitic gaps

These syntactic properties make a clear distinction between the *la quale* and *cui/che* appositive relatives, Cinque (2008) refers to appositive relative clauses behaving like the *la quale* constructions as non-integrated appositive relative clauses, whereas those resembling the *cui/che* constructions are classified as integrated appositive relative clauses. According to his analysis, not all languages have both types of appositive relative clauses. The coexistence of both integrated and non-integrated types is attested in languages such as Italy, France, Spanish, and so on. However, some languages display only the integrated one (e.g., Japanese, Turkish, Yoruba...), while others exhibit only the non-integrated one (e.g., English, Romanian...).

This part is an overview of appositive relative clauses based on their different syntactic properties. The following part will introduce their various syntactic typology.

4.3.2 Syntactic Typology of Appositive Relative Clauses

The previous Chapter 2.9.1 summarizes seven forms of relative clauses at the syntactic level: externally headed post-nominal, externally headed pre-nominal, internally headed, double-headed, headless, correlative, and adjoined relative clauses. Building on this classification, Cinque (2020) proposes that the appositive relative clauses can also be divided into different types according to their syntactic typology, which will be illustrated in the following.

Externally Headed Post-Nominal Appositive Relative Clauses

Externally headed post-nominal appositive relative clauses are the most common forms of appositive relative clauses. Based on the data previously discussed in the analysis of integrated and non-integrated appositive relative clauses, it is obvious that externally headed post-nominal appositive relative clauses can be either integrated or non-integrated.

(18) a. Se Carlo$_i$ non amava più **Anna**$_j$, i quali$_{i,j}$ d'altra parte non si erano mai voluti veramente bene, una ragione c'era.
if Carlo not love any-longer Anna who of other side not Recipr. were ever wanted really well a reason there was
'if Carlo was no longer in love with Anna, who never really loved each other at any rate, there was a reason'

b. Facendo questo rovinerà anche se **stesso**$_i$, che$_i$ non avrebbe certo bisogno di altre disgrazie.
doing this he-will-ruin also self he that not would-have certainly need of other misfortunes
'by doing this he will also ruin himself, that would certainly not need another blow now.'

The examples in (8-a) and (13-a), which are repeated here as (18-a) and (18-b) respectively. As shown in these examples, both the head noun *Anna* in (18-a) and *stesso* 'himself' in (18-b) appear externally and precede the appositive relative clauses, forming an externally headed post-nominal structure. (18-a) is the non-integrated one, introduced by the relative pronoun *la quale*, while (18-b) is the integrated *che* appositive relative. However, the situation changes when the relative clause precedes the head noun in the appositive relative construction. This distinction is further in the following section.

Externally Headed Pre-Nominal Appositive Relative Clauses

The existence of externally headed pre-nominal appositive relative clauses has raised many disputations. Citko (2008), De Vries (2005), and Krause (2001) claim that syntactically pre-nominal relative clauses cannot be semantically appositive. However, genuine cases

of externally headed pre-nominal appositive relative clauses in some languages challenge this claim. Several counterexamples are provided in the following:

(19) Japanese

[$_{RC}$ Shuuron-o kaite i-ru] **Iwasaki**-san-ga sono
master's.thesis-ACC write be-PRES Iwasaki-HON-NOM the
gakkai-de happyo shi-ta.
conference-at presentation do-PAST
'Mr. Iwasaki, who is writing a master's thesis, presented a paper at the conference.' (Del Gobbo, 2017)

(20) Korean

[$_{RC}$ Mary-ka kongpuha-lyeko manna-nun] **Jon**-un ttayttaylo kitha-lul
Mary-N study-for meet-Nzr Jon-top sometimes guitar-A
chi-n-ta.
play-prs-decl
'Jon, who mary meets for studying, sometimes play guitar.' (Krause, 2001)

(21) Turkish

[$_{RC}$ Bugün Ankara-dan gel-en] **Ali** çok yorgun.
today Ankara-ABL come-REL Ali so tired
'Ali, who came from Ankara today, is so tired. (Meral, 2018)

(22) Mandarin Chinese

[$_{RC}$ xianglai jiu bu ai du shu de] **Xiaoming** xianzai ye kaishi
always then not love study book DE Xiaoming now also begin
du-qi shu lai-le.
read-ASP book come-ASP
'Xiaoming, who does not love to study, now also has begun to study. (Del Gobbo, 2017)

As shown in the examples above, the head nouns *Iwasaki* in (19), *Jon* in (20), *Ali* in (21) and *Xiaoming* in (22) follow the relative clauses, indicating that pre-nominal appositive relative clauses are available in languages such as Japanese, Korean, Turkish, and Chinese. These constructions share key characteristics: the lack of relative pronouns and the requirement that the antecedent be nominal. Based on these observations, Cinque (2020) hypothesizes that externally headed pre-nominal appositive relative clauses can only be the integrated construction. In a later section of this chapter, I will take Mandarin Chinese, which permits only the pre-nominal form of appositive relatives, to explore the relationship between pre-nominal positioning and integrated appositive relative clauses. Thus, no further discussion will be shown here. Internally headed appositive relative clauses, which are also assumed to be limited to the integrated type, will be discussed in the following section.

Internally Headed Appositive Relative Clauses

The internally headed appositive relative clauses are claimed to be unavailable by De Vries (2005, 2006). Cinque (2020) believes that although this type of relative clause does not exist extensively, it is not reasonable to deny its existence. He lists some language data documented in the literature, which is shown as the following (23)(24)(25) :

(23) Haida (isolate)

[$_{RC}$ tuut-ee-raa **qung-ee** 7ij-aa-n] -raagala 7waa-gaa-n
box-DF-in moon-DF be-EVID-PST-for 3PERS do-EVID-PST
He did it for the moon, which was in the box. (Cinque, 2020; Enrico, 2003)

(24) Kharia (Munda)

[$_{RC}$ lebu=ki **iŋ=te** yo=yoʔ=ki] peʔŋokh=oʔj
person=P 1S=OBL see=A.PT=P rice.eat=A.PT.1S
I, who the populace saw, ate rice. (Cinque, 2020; Peterson, 2010)

(25) Cabecar

[$_{RC}$ i **dawá** dul kal jula ñá ká jëk
3 brother.in.law POS.stand tree hand/arm IN NEG RFL
]dáli-ñ-ë
move-D.MID- NEG.PFV
His brother-in-law, who was standing on the branch, did not move. (Campos & Lehmann, 2021; Cinque, 2020)

It is evident that in the examples above, the head nouns (marked in bold) appear within the relative clause itself. This internal positioning of the overt head nouns characterizes the internally headed appositive relative clauses as integrated constructions. In contrast, double-headed appositive relatives, which involve the presence of two head nouns, only allow for the non-integrated type. The incompatibility of integrated structures with double-headedness stems from their syntactic constraints. This distinction will be illustrated in the following section.

Double-Headed Appositive Relative Clauses

In the previous section, a comparison between integrated and non-integrated appositive relative clauses has been illustrated. One property of non-integrated appositive relatives is the possible retention of head nouns, which represents double-headed appositive relative clauses. The example in (9-a) is repeated here as (26).

(26) Se quel **farmaco**, il quale **farmaco** è il frutto di molti anni di lavoro,
if that medicine which medicine is the result of many years of work
non è stato messo in commercio, una ragione ci devessere.
not be been put on market a reason there must.be

'if that medicine, which medicine is the result of many years work, was non-commercialized, there must be a reason.'

In (26), there are two head nouns *farmaco* 'medicine': one head noun is internal, and the other one is external. Both retained in the relative clause, forming the construction of double-headed appositive relative clauses. In other words, the two overt Heads can be viewed as independent elements, which limits the possibility of integrated appositives. The following section will analyze conditions that permit a non-restrictive reading in correlatives.

Correlative Appositive Relative Clauses

The Hindi relative clauses have been cited as an example to reflect the construction of the correlative relative clauses. The example in (61) is repeated here as (27).

(27) Hindi

[$_{RC}$ jo **laRkii** khaRii hai] vo lambii hai
REL girl standing is DEM tall is
'the girl who is standing is tall' (Srivastav, 1991a)

As analyzed in Chapter 2, the correlatives are left-adjoined to the matrix clause. The demonstrative *vo* is a correlative in (27), which creates a referring relation to the head noun *laRkii* 'girl' with the relative clause. However, the correlative cannot be a proper name in Hindi relative clauses, thus Dayal (2012) argues that the correlatives are impossible to receive the non-restrictive reading because the appositive relatives typically occur with proper names in Hindi.

(28) a. [$_{RC}$ jo **laRkii** khaRii hai] *(vo) anu lambii hai
which girl standing is Anu tall is
'Which girl is standing, Anu is tall.'

b. **annu** [$_{RC}$ jo khaRii hai] lambii hai
Anu who standing is tall is
'Anu, who is standing, is tall.'

The examples cited in (28) reflect the conflicting relation between the correlative and the non-restrictive reading. (28-b) is the appositive relative clause, which takes the proper name *Annu* as the head noun. However, the existence of the proper name in the correlative like that in (28-a) causes the sentence violation. The existence of proper name must come together with the demonstration *vo*, however, *Anu* functions like a common noun in this case. Lupke (2005) and Morshed (1982) analyzes the correlatives in Bangla and Jalonke languages separately, which seems to support the non-restrictive reading of the correlatives.

(29) Bangla

bhoddrolok, [$_{RC}$ jini amar ãttio], tini bose achen
gentleman who my relative he sitting is
The gentleman, who is my relative, is sitting.

(30) Jalonke

N [$_{RC}$ naaxan a fala-m ibɛ jɛɛ], n saa-xi saar-ɛɛ ma
1SG REL 3SG speak-IPFV for PART 1SG lie-PF bed-DEF at
lit:' which I is speaking to you now, I lie in bed.'

It is evident that the non-restrictive reading is available in (29) and (30). However, these cases lack overt head nouns within the relative clauses. Combing this with the violation shown in (28-a), Cinque (2020) hypothesizes that the presence of overt head nouns blocks the possibility of a non-restrictive reading in correlatives. If head noun deletion is permitted, as in Bangla and Jalonke, correlative appositive relatives are possible. Otherwise, as in Hindi, such constructions are not allowed. The next part moves to the analysis of the non-restrictive reading in another specific typology of relative constructions, which is adjoined relatives.

Adjoined Appositive Relative Clauses

The construction of adjoined appositive relative clauses can be found in the Walbiri language (31):

(31) Walbiri

maliki-li ka minitja watjilipi-nji, [$_{RC}$ kutja-lpa-pala-njanu
dog-erg AUX cat chase-nonpast COMP-AUXrecip
kulu-ŋku nja-ŋu]
anger-erg/inst look-past
'the dog is chasing the cat, which were looking at one another angrily' (Hale, 1976)

In (31), an NP-relative interpretation is required as the relative clause is simultaneously constructed with both the subject *maliki-li* 'dog' and the object *minitja* 'cat' of the main clause. Thus, the sentence shown in (31) cannot be derived from the extraction of head nouns. It seems that only an adjunction analysis is applicable, which links the subordinate clauses to the main one via NP-coreferentiality. In this case, (31) represents adjoined relative clauses with a non-restrictive interpretation. The following section will explain how apositive relatives are still available even in the absence of overt head nouns.

Headless Appositive Relative Clauses

The most evident feature of headless relative clauses is the absence of an overt head noun. This lack of an independent referential element within the clause prevents the possibility of a non-restrictive interpretation altogether.

(32) a. ∗ People to whom we talked about, what(ever towns) they had seen, were grateful.
b. ∗ My friends took all of, what Bill had baked, to the party. (J. Emonds, 1979)

The examples in (32) lack overt head nouns, which makes the sentences ungrammatical. However, , without the comma intonation, (32) would be a well-known grammatical construction. It suggests that headless relative clauses can only be restrictive ones. Kuroda (1968) further supports the restrictive interpretation of headless relative clauses by proving that the independent relative pronoun *what* is closely paraphrased by *that which*.

(33) a. He credited [$_{RC}$ what they had discovered to someone else].
b. He credited **that** [$_{RC}$ which they had discovered to someone else]. (J. Emonds, 1979)

In (33-a), the independent relative pronoun *what* introduces a headless relative. (33-b) provides a paraphrase of (33-a), where the demonstrative *that* actually functions as the antecedent. This antecedent *that* is modified by the *which* relative clause, which forms a headed relative construction with a restrictive meaning. Thus, this supports the claim that headless relative clauses do not allow for an appositive (non-restrictive) reading.

This section introduces Cinque (2020)'s classification of appositive relative clauses. Based on syntactic properties, appositive relatives can be divided into two main types: integrated and non-integrated . Moreover, he summarizes the syntactic typology of appositive relatives in the literature. In his proposal, the appositive interpretation is possible in externally headed post-nominal/pre-nominal, internally headed, double-headed, and adjoined relative clauses. Meanwhile, headless relative clauses are the only type that cannot support an appositive reading. Up to now, a general picture of appositive relative clauses has been created. The next part will go further into this type of relative constructions.

4.4 Analyses of Appositive Relative Clauses

As analyzed previously, the *raising* and *matching* of head nouns are two ways of deriving restrictive relative clauses. These derivational strategies reflect different syntactic relationships between the relative clause and its antecedent, which in turn result in varying behaviors across phenomena such as extraposition, stacking, case, scope, etc. Building on

this foundation, the analysis of appositive relative clauses will start by illustrating the relation between appositive relative clauses and their antecedents. Then, the discussion will extend to the specific structure analyses of appositive relative clauses proposed in the literature, including J. Emonds (1979) and J. R. Ross (1967)'s main clause hypothesis, Jackendoff (1977)'s subordinate clause hypothesis, De Vries (2002)'s coordination hypothesis . Finally, Cinque (2020)'s double-headed hypothesis will be applied here to unify the derivation of appositive relative clauses.

4.4.1 The Relationship Between Appositive Relative Clauses and Their Antecedents

Raising and *matching* are two distinct derivational strategies proposed for restrictive relative clauses, each supported by substantial empirical evidence. The former refers to the raising of the head noun (the antecedent). Thus, it is subject to movement constraints. In contrast, the matching one refers to the case where one head noun is deleted by the other under the same identity. In appositive relative clauses, both movement and non-movement of head nouns seem to be plausible. Their evidence can be found in extraposition, stacking, violation of Principle C, the lack of idiom chunk interpretation, scope assignment, quantifier, and negative polarity item licensing, and case mismatches, which will be explicitly illustrated in the following part.

Extraposition

As analyzed previously, relative clauses derived via the matching approach can undergo extraposition. This kind of extraposition is illustrated in (29), which is repeated here as (34).

(34) a. Non-extraposed
John guessed the price yesterday that Mary guessed.
b. Extraposed
John guessed $[_{NP}$ the price $t_i]$ yesterday $[_{RC}$ that Mary guessed$]_i$.

(34-b) reflects the extraposition of restrictive relative clauses, where the restrictive relative *that Mary guessed* is extraposed from the NP the price that Mary guessed. The possible reading of (34-b) is *John and Mary both knew the same price yesterday* instead of *John knew which price Mary knew yesterday*, suggesting that the matching approach is applied here. While, J. Emonds (1979), R. J. C. Smits (1988), and Vergnaud (1974) argue that appositive relatives, unlike restrictive ones, cannot undergo NP extraposition. Seen in the ungrammaticality of (35):

(35) a. Non-extraposed
These men, [$_{RC}$ who Mary had been insulting], appeared at the door.

b. Extraposed
$*$ These [$_{NP}$ men t_i appeared at the door], [$_{RC}$ who Mary had been insulting]$_i$.

c. Non-extraposed
John, [$_{RC}$ who had just caught the inspector's ire], exploded.

d. Extraposed
$*$ [$_{DP}$ John t_i exploded], [$_{RC}$ who had just caught the inspector's ire]$_i$.
(Vergnaud, 1974)

However, extraposition of appositive relative clauses seems to be available in some languages like that in German (36):

(36) a. Jeder Wanderer, [$_{RC}$ der Schneeschuhe trug], hat das Riemannhaus
every hiker who snowshoes wear has the Riemannhaus
erreicht. (Non-extraposed)
reached
'The hiker who was wearing snowshoes has reached the Riemannhaus.'

b. [$_{DP}$ Jeder Wanderer t_i hat das Riemannhaus erreicht], [$_{RC}$ der
every hiker has the Riemannhaus reached who
Schneeschuhe trug]$_i$. (Extraposed)
snowshoes wearing
'The hiker who was wearing snow shoes has reached the Riemannhaus.'
(Poschmann & Wagner, 2016)

It appears that the impossibility of extraposition in appositive relative clauses is a property specific to English, and does not necessarily apply across languages. This cross-linguistic variation suggests that determining whether head noun movement occurs in appositive relative clauses is not straightforward and may depend on language-specific syntactic properties.

Stacking

The stacking of relative clauses provides further evidence to support the non-movement analysis of head nouns. As discussed before, restrictive relative clauses can be stacked. The previous examples (30) (31) (repeated here as (37-a) and (37-b)) reflect this stacking case:

(37) a. The stacking in *that*-relatives
the book [$_{RC1}$ that John wrote] [$_{RC2}$ that Bill burnt].

b. The stacking in *which*-relatives

the book [$_{RC1}$ which John wrote] [$_{RC2}$ which Bill burnt].

According to the above examples, stacking is available in both *which* and *that* restrictive relative clauses. However, Alexiadou et al. (2000), Jackendoff (1977), and R. J. C. Smits (1988) suggest that, unlike restrictive ones, appositive relative clauses do not permit stacking.

(38) a. the man who came to dinner who hated lox.
b. ∗ the man, who came to dinner, who hated lox. (De Vries, 2002)

Broekhuis and Keizer (2015) argues that the stacking of appositive relative clauses is restricted but not impossible. In his analysis, appositive relative clauses can be stacked provided that different relative pronouns are employed within the construction. This observation is supported by the examples in (39), which are drawn from Dutch and demonstrate the grammaticality of appositive clause stacking under such conditions.

(39) a. ?? De student, [$_{RC1}$ die hier net was], [$_{RC2}$ die Engels studeert], is mijn
the student who here just was who English studies is my
vriend.
friend
'the student, who was just here (and) who studies English, is my friend.'
b. Jan, [$_{RC1}$ die net vertrokken is], [$_{RC2}$ van wie ik geen adres heb], is
Jan who just left is of whom I no address have is
onvindbaar.
untraceable
'Jan, who has just left (and) of whom I have no address, is untraceable.'

Two examples are presented in (39). In (39-b), the use of two distinct relative pronouns, *die* 'who' and *wie* 'whom', resulting in a much more acceptable construction compared to (39-a), which employs only the single relative pronoun *die* 'who'. Thus, it is unreasonable to deny the possibility of appositive clause stacking across all languages.

Violation of Principle C

The Principle C effects, as obvious evidence for movement, are not available in either restrictive or appositive relative clauses.

(40) a. the picture of Bill$_i$ that he$_i$ likes.
b. this picture of Bill$_i$, which I think he$_i$ likes,...

(40-a) (a repeat of (22)) and (40-b) represent restrictive and appositive relatives, respectively. In both examples, the R-expression *Bill* is c-commanded by the pronoun *he*, which violates Principle C. While the effects of Principle C can be found in restrictive

clauses with idiom chunk interpretation, as illustrated in the comparison between the two restrictive relative clauses shown in (41) (the example (23) is repeated here).

(41) a. *The headway on Mary's project she had made pleased the boss. (with idiom chunk interpretation)
b. The headway on her project Mary had made pleased the boss. (no idiom chunk interpretation)

The lack of Principle C in appositive relative clauses suggests that the raising of head nouns is dubious in their relativization.

Idiom Chunk Interpretation

The previous paragraph mentions the requirement of adhering to Principle C in restrictive relative clauses, particularly in cases involving idiom chunk interpretation. Idioms need the head nouns to be interpreted within the relative clause, which serves as evidence for the raising approach. However, this idiom chunk interpretation is not possible in appositive relative clauses.

(42) a. ∗ The headway, [$_{RC}$ which the students made last week], was phenomenal.
b. ∗ The advantage, [$_{RC}$ which they took of me last week],...
c. ∗ The fun, [$_{RC}$ which they made of me]...

The ungrammatical sentences illustrated in (42) prove that idiom chunk interpretation is not permitted in appositive relative clauses. It means the interpretation position for head nouns *headway*, *advantage*, and *fun* are not within the relative clause. In this case, these overt head nouns are not raised from the position within the relative clause.

Scope Assignment

Appositive relative clauses provide additional information about the head nouns, thus the appositive is under the scope of the whole antecedent DP. In contrast, restrictive relatives are under the scope of a determiner or quantifier that belongs to the antecedent. In this case, the scope assignment of the head nouns (relativized NPs) behaves differently in appositive and restrictive relatives.

(43) a. No linguist would read the many books$_i$ Gina will need t$_i$ for vet school. (need ≥ many) (Sauerland, 1998)
b. No linguist would read the many books, which Gina will need for vet school. (many ≥ need)

The example in (18) is repeated here as (43-a). The interpretation of restrictive relative

clauses (43-a) is *Gian needs so many books for vet school such that no linguist would read that many books*, while the appositive one (43-b) shows the opposite interpretation that is *no linguist would read that many books that Gian needed for vet school*. It is clear that *need* fails to take scope over *many*, which means the head noun *many books* is not interpreted within the appositive relative clause. This highlights the difference in how scope assignment works in restrictive versus appositive relative clauses.

Licensing of Quantifiers and Negative Polarity Items

In appositive relative clauses, not only is the scope assignment of relativized NPs restricted, but the licensing of quantifiers and negation is also blocked. De Vries (2002) proposes that appositives are barriers to the licensing of variable binding relations, which causes issues with the licensing of quantifiers and negation.

(44) a. $*$ Everybody$_i$ forgives John, [$_{RC}$ who harms him$_i$].
b. Everybody$_i$ forgives a man [$_{RC}$ who harms him$_i$].

In the examples in (44), (44-a) represents an appositive relative, while (44-b) is the restrictive one. The violation of (44-a) is caused by the failure of quantifier licensing, where the quantified antecedent *everybody* fails to license the pronoun *him*. Safir (1984) proposes the *Scope Condition* that a pronoun bound by a quantifier must be c-commanded by that quantifier at LF. If the raising approach is applied in the derivation of (44-a), the quantified antecedent *everybody* would be raised from the position within the relative clause, allowing a c-commanding relationship with the pronoun *him*. The absence of such a bound interpretation in (44-a) suggests that it is not derived via head noun raising. However, the availability of a bound reading in (44-b) supports the application of the raising approach in restrictive relatives. In some special cases, a quantifier appear to bind a variable within an appositive, and the example of this case would be shown in (45)

(45) a. Every rice-grower$_i$ in Korea owns a wooden cart, [$_{RC}$ which he$_i$ uses when he$_i$ harvests the crop].
b. Every man$_i$ has two hands, [$_{RC}$ which serve him$_i$ well].

The quantifier *every* appears to license the pronoun *he* in (45-a) and *him* in (45-b). According to the analysis of Sells (1985), three primary mechanisms link anaphoric elements to antecedents: syntactic binding, specification (discourse licensed anaphora), and coreference (based on the 'knowledge of the world'). It is evident that the relation between *every* and *he/him* can be inter-sentential, which means they are linked by cospecification instead of syntactic binding. Thus, the grammatical examples shown in (45) could not prove that the head nouns *every rice-grower / every man* are raised from the position within the appositive relative clauses to c-command the pronouns *he/ him*. Moreover,

cases involving the licensing of negative polarity items in appositive relative clauses also raise challenges to the viability of the raising approach in such constructions.

(46) a. ∗ I didn't see Bill, [$_{RC}$ who had had any drinks].
b. I didn't see a man [$_{RC}$ who had had any drinks]. (Jackendoff, 1977)

The example in (46-a) suggests that the negative polarity item *any* cannot be licensed by the negation *not* in the appositive relative clause. However, the same situation would be acceptable in a restrictive relative clause like that in (46-b). Obviously, appositive relative clauses affect the licensing of negation in this case. The deduction would be made that the relation between the antecedent and the relative clause differs fundamentally between appositive and restrictive constructions.

Case Mismatch

The case issue must also be considered in the analysis of relativization. Similar to restrictive relative clauses, appositive relatives also exhibit case mismatches between the heads and wh-pronouns in certain languages.

(47) German

Du kennst doch den Jan, der unser Manager ist?
you know yet the.ACC Jan who.NOM our manager is
'You know Jan, who is our manager,don't you?' (De Vries, 2006)

In the German appositive relative clauses shown in (47), the head noun *Jan* is marked by accusative case *den* 'the', while the relative pronoun *der* 'who' is marked with nominative case. As analyzed before, if the head noun were derived via movement from within the relative clause, it would be expected to share the same case marking as the relative pronoun. The mismatch observed here thus challenges the possibility of a raising derivation for appositive relative clauses.

According to the above analysis, a preliminary conclusion can be drawn: the relation between head nouns and relative clauses differs significantly between appositive and restrictive relative clauses. Thus, the following section will focus on the specific structure analysis of appositive relatives.

4.4.2 Structure of Appositive Relative Clauses

The above analysis offers an overview of the relation between appositive relative clauses and their antecedents, highlighting key differences from their restrictive counterparts. De Vries (2002) argues that the previous analyzing approaches (*raising* and *matching*) are not suitable for appositive relative clauses due to the differences in scope between restrictive and appositive relatives.

(48) Dutch

a. Jij hebt twee violen, die trouwens al heel oud zijn, en ik heb er drie.
you have two violins which besides already very old are and I have there three

b. = & I have three violins.

c. ≠ & I have three violins, which are already very old, by the way. (De Vries, 2002)

Example (48-b) and (48-c) serve as paraphrases of (48-a). The incorrect interpretation shown in (48-c) suggests that the appositive relative clause takes scope over the quantifier *drie* 'three'. This phenomenon supports the claim made by R. J. C. Smits (1988), who argues that a quantifier cannot contain both the noun and the appositive relative clause. Review the *raising* and *matching* analysis applied in restrictive relative clauses, which is simplified in the following (49).

(49)

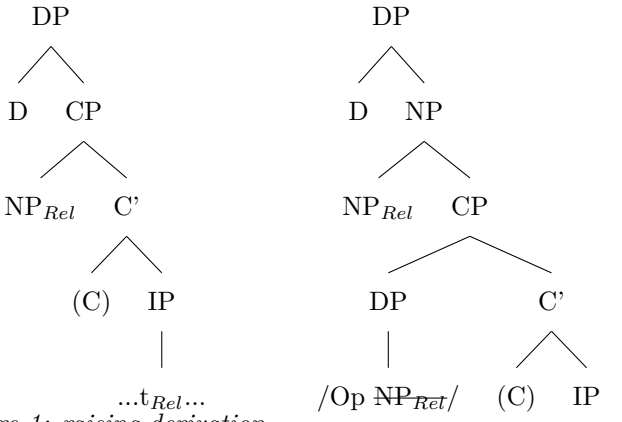
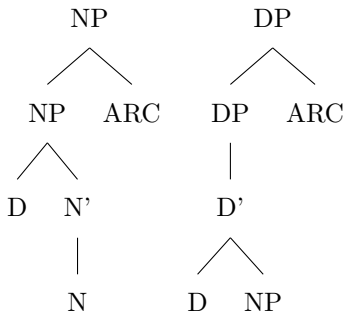


Figure 1: raising derivation

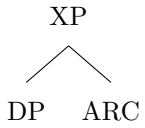
Figure 2: matching derivation

As shown in (49), it is clear that the external determiners or quantifiers are in a higher position than the relative clauses. In this case, the relative clauses are required to fall within the scope of determiners or quantifiers. Obviously, the original *raising* and *matching* derivations conflict with the scope assignment observed in appositive relative clauses, as analyzed in (48). To account for this discrepancy,De Vries (2002) concludes three potential structural configurations for appositive relative clauses: (i) adjunction, as shown in (50-a), (ii) surrounding phrase structure, in (50-b), and (iii) orphanage, in (50-c).

(50) a. Adjunction



b. Surrounding phrase



c. Orphanage

DP...ARC

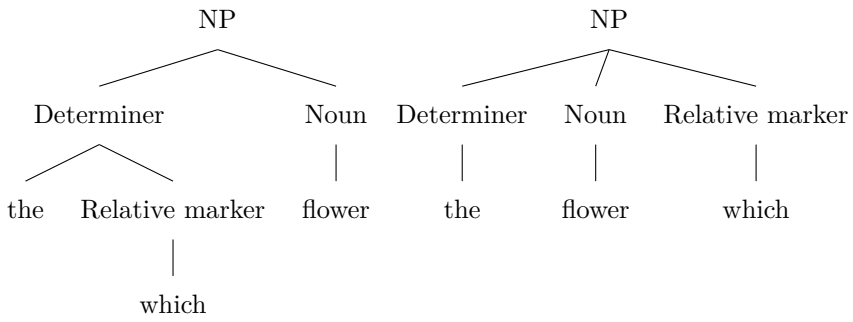
The structure shown in (50) reflects cases where determiners or quantifiers are no longer in a position to take scope over appositive relative clauses. Based on these potential structures, the following part will offer a specific analysis of appositive relative clauses.

Smith (1964)'s D-Complement Hypothesis

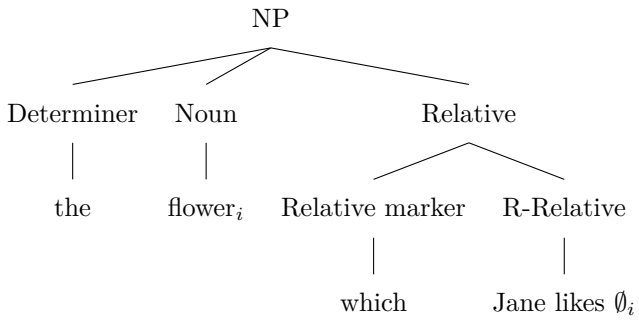
Review the previous analysis of restrictive relative clauses, Smith (1964) posts the hypothesis of the R-relative (restrictive relative) adjunction structure: the relative clause adjoins to the left of the noun phrase to form the linear order Det-N-Relative Clause . This transformation is illustrated in (3), repeated here as (51).

(51) The flower$_i$ which Jane likes $\emptyset_i$.

a. order change



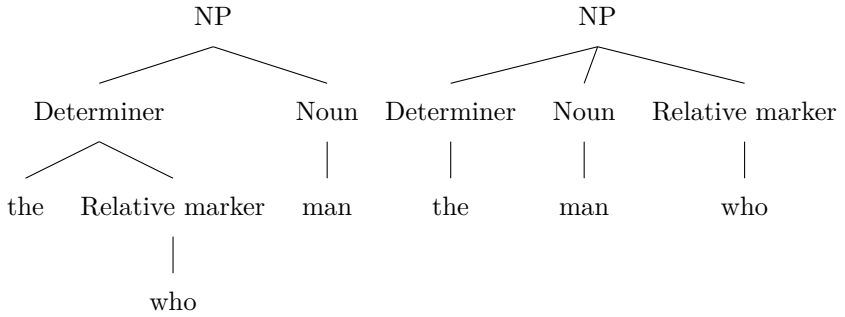
b. R-relative adjunction



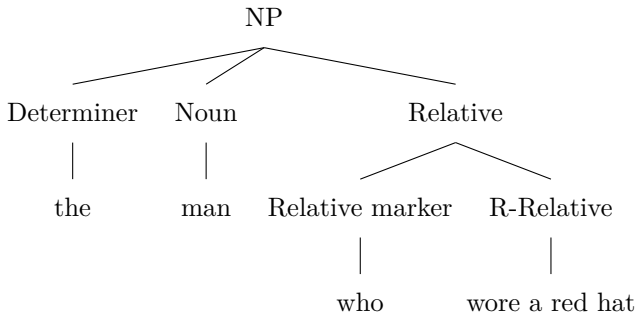
In Smith (1964)'s analysis, restrictive and appositive relative clauses differ in their selection of determiners. There are three classes of determiners in relativization: unique (e.g., proper names), specified (e.g., a, the), and unspecified (e.g., any, all,). Unspecified determiners can be applied to both restrictive and appositive relatives. Specified determiners, however, are restricted to restrictive relatives, while unique determiners are characteristic of appositive relatives. Despite these differences in determiner selection, appositive and restrictive relatives share the same derivation approach. Seen in the derivation of appositive relatives in (52).

(52) The man, who wore a red hat.

a. order change



b. A-relative (Appositive relative) adjunction



The shortcomings of the D-complement analysis are obvious in its inability to clearly distinguish between appositive and restrictive relatives. Also, this adjunction structure fails to account for the scope differences observed between the two types of relatives, particularly the broader scope associated with appositive relative clauses compared to

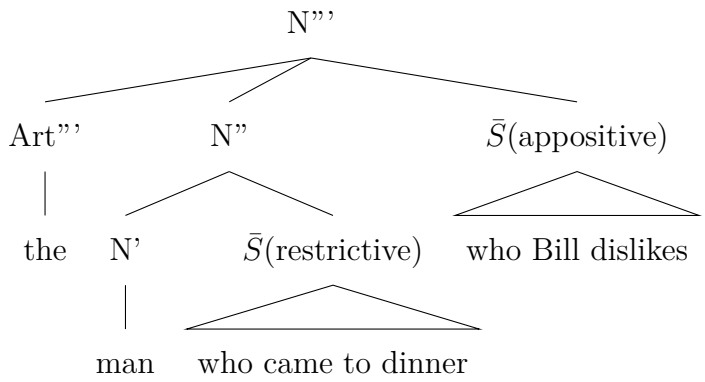
the more locally scoped restrictive relatives.

Jackendoff (1977)'s Subordinate Clause Hypothesis

The subordinate clause hypothesis of appositives posits that an appositive relative clause forms a constituent with the phrase it modifies, functioning as a subordinate rather than a main clause. Kuroda (1968) and Smith (1964) firstly propose the subordinate clause hypothesis which is formalized by Jackendoff (1977). Jackendoff (1977)'s work starts from comparing the syntactic structures of appositives and restrictive relative clauses, where he claims that restrictive relative clauses are daughters of N" and appositives are daughters of N"'. This structural distinction can be illustrated as follows:

(53) a. the man who came to dinner, who Bill dislikes.

b.



In (53), it is clear that the attachment positions of restrictive and appositive relative clauses are different. Supporting evidence is provided in (54), which demonstrates that appositives must appear to the right of restrictive relatives.

(54) a. The man that came to dinner, who was drunk, fainted.
b. $*$ The man, who was drunk(,) that came to dinner fainted.

Under the subordinate hypothesis, appositives function as complements of N"'. Jackendoff (1977) assumes that the comma intonation preceding appositives is a defining feature of all X"' complements due to the fact that similar intonational patterns also occur with sentence-final adverbs and parenthetical expressions, as illustrated in (55).

(55) a. This ice cream tastes like spaghetti, of course.
b. This ice cream tastes like spaghetti, probably.
c. This ice cream tastes like spaghetti, I bet.
d. This ice cream tastes like spaghetti, no doubt.

Jackendoff (1977) also offers a reasonable explanation for the interpretation of appositive relative pronouns, formalized in (56):

(56) Appositive Wh-interpretation
$\{\frac{X}{+Wh}\}$"' is anaphoric to Y"', in the configuration
[$_{Y'''}$ ... Y" [$_{\bar{S}}$[$_{Comp}$ ... X"' ...]S]]

In the formulation (56), Y"' represents for N"', V"', A"' or P"'. For N"' appositives, the anaphoric relation is clearly one of coreference. However, for appositives attached to other categories such as V"', A"', or P"', the nature of the anaphoric relation is less straightforward. This contrast is illustrated by the comparative examples in (57):

(57) a. John likes your idea, but it's crazy.
John likes your idea, which is crazy. (N"' appositives)
b. Bill came late, and that bothered Susan.
Bill came late, which bothered Susan. (V"' appositives)
c. Bill is drunk all the time—is that how you'd like to be?
Bill is drunk all the time, which is probably how you'd like to be. (A"' appositives)
d. Bill went into the tree, and that's where I'd like to go too.
Bill went into the tree, which is where I'd like to go too. (P"' appositives)

The above examples suggest that the appositive pronoun *which* functions similarly to the demonstratives *it* and *that*, all serving as forms of anaphoric reference.

J. Emonds (1979)'s Main Clause Hypothesis

The earliest specific analysis of appositive relative clauses might be posted by J. R. Ross (1967), which argues that appositive relatives are main clauses in the deep structure and are coordinated with the matrix clause. Thus, the sentence (58-b) would originally derive from the sentence (58-a) and then transform into the appositive structure exemplified in (58-c).

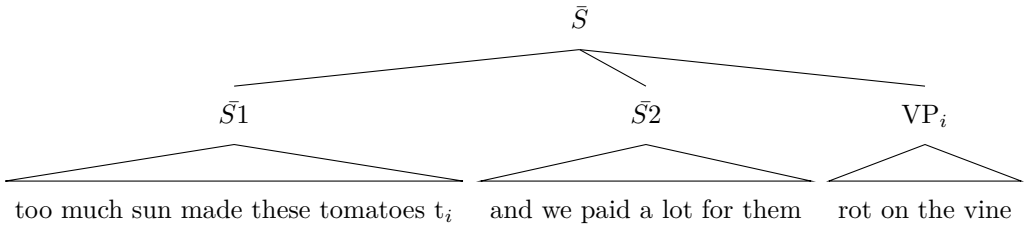
(58) a. Too much sun made these tomatoes rot on the vine, and we paid a lot for them.
b. Too much sun made these tomatoes, and we paid a lot for them, rot on the vine.
c. Too much sun made these tomatoes, [$_{RC}$ which we paid a lot for], rot on the vine.

This main clause hypothesis of appositive relatives has been formalized by J. Emonds (1979) in his research. J. Emonds (1979)'s main clause hypothesis is inspired by the analysis of parentheticals, which exhibit similarities to appositives. The formation of parentheticals has been illustrated in the work of J. E. Emonds (1976).

(59) Parenthetical Formation
X —C^{max} —$\{\frac{\bar{S}}{PP}\}$ —Y $\Longrightarrow$ 1 —$\emptyset$ —3+2 —4
where 1-2 is a root $\bar{S}$, and C^{max} is a phrasal constituent that is a maximal projection of a lexical category in the bar (prime) notation. Throughout, $\bar{S}$ will refer to COMP+S.

(59) reflects the rule of parenthetical formation, which is applicable to all sentence-oriented parentheticals. In this rule, a constituent (marked as number 2 here) at the left-hand clause is moved to the right position around a constituent exterior to that clause. Based on this mechanism, the derivation of (58-b) can be drawn as the following (60):

(60)



(60) reflects the application of the parenthetical formation rule. The VP *rot on the vine* moves outside of its original position (within the left clause $\bar{S}1$) and stands at the position right to the clause $\bar{S}2$. Although the appositive relative (58-c) and the parenthetical (58-b) share key structural similarities, there are still notable differences between them. These distinctions can be summarized as follows in (61):

(61)
a. the parenthetical coordinate clause *and we paid a lot for them* is asserted in (58-b), while the appositive relative *which we paid a lot for* in (58-c) is presupposed.
b. a coordinating conjunction *and* is only allowed in (58-b) but not in (58-c).
c. a personal pronoun *them* which co-refers with the antecedent *these tomatoes* can be available in (58-b) but not in (58-c).
d. a wh-form *which* co-refers with the antecedent *these tomatoes* can be available in (58-c) but not in (58-b).

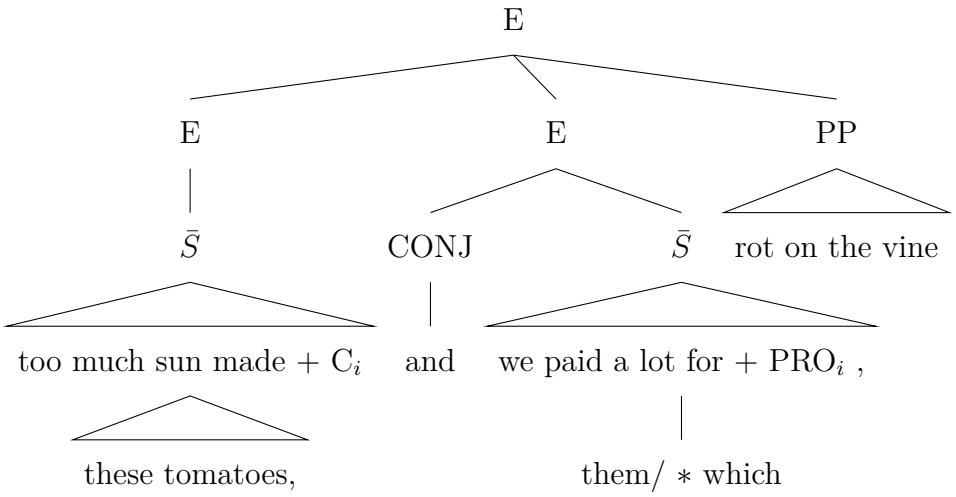
The distinctions outlined above trigger further consideration of deriving appositive structures. J. Emonds (1979) takes the concept of $\bar{S}$-Attachment to account for the differences between (58-b) and (58-c), which is formulated in (62):

(62) $\bar{S}$-Attachment
C_i - CONJ - $\bar{S}$ $\Longrightarrow$ 1+3- $\emptyset$ - $\emptyset$
where $\bar{S}$ contains PRO_i

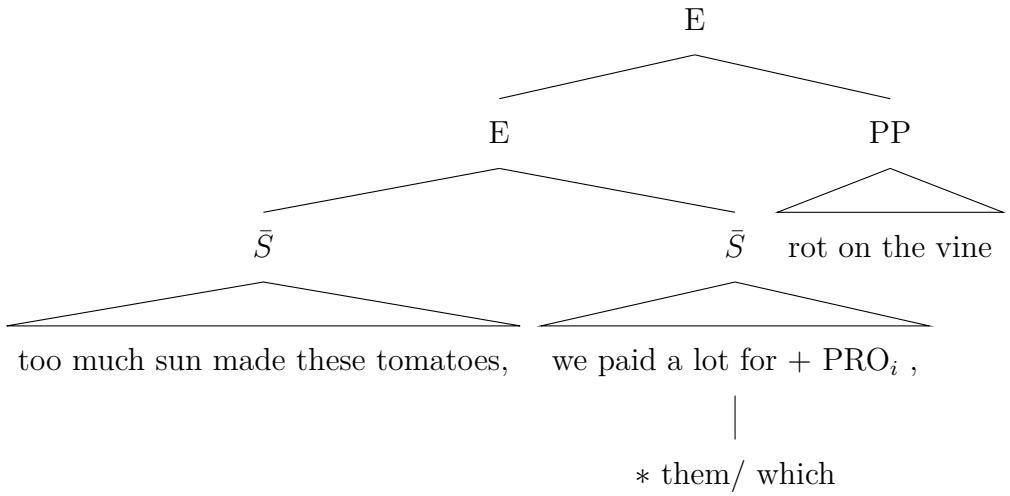
According to the ordering of transformation hypothesized by Chomsky (1965), no material can be moved into an $\bar{S}$ from the outside. J. E. Emonds (1970) posts the structure-preserving framework, which reinforces the constraint that the attachment shown in (62) is

restricted to a root $\bar{S}$ or higher. Thus, the operation of $\bar{S}$-Attachment can be diagrammed in (63):

(63) a.



b.



J. Emonds (1979) holds the view that each separate declarative or interrogative E contains a distinct assertion, but it is not correct in cases where pairs of root $\bar{S}$ s are within a single E. Combing the diagram shown in (63), the appositive relative *which we paid a lot for* which is the output of $\bar{S}$-Attachment is presupposed even though its source E is asserted. This analysis offers a plausible account for the contrast observed in (61-a).

The structure in (63) can also account for the obligatory absence of conjunction in appositive relatives, as observed in (61-b). J. E. Emonds (1976) proposes that specified formative deletions are similar to all other grammatical transformations, namely as local, root, and structure-preserving operations. In (63), the $\bar{S}$-Attachment contains two phrasal nodes, implying that the deletion of conjunction must be a root operation. This suggests that a conjunction must be immediately dominated by a root.

Following J. R. Ross (1967)'s idea that appositive relatives only require co-reference instead of *and*-coordination, J. Emonds (1979) assumes that the deleted conjunction in (63) is not only the coordinate conjunction *and* but also can be a null conjunction (dom-

inating $\triangle$). As shown in (64) (65) and (66), the unacceptability of (64) proves that the appositive relative in (66) is derived from the structure in (65), rather than from (64), via $\bar{S}$-Attachment.

(64) a. $*$ Go to Cincinnati, and it is on the Ohio River.
b. $*$ Are we landing in. Washington, and it is on the Potomac.

(65) a. Go to Cincinnati, $[_{CONJ}\ \triangle]$ it is on the Ohio River.
b. Are we landing in. Washington, $[_{CONJ}\ \triangle]$ it is on the Potomac.

(66) a. Go to Cincinnati, which is on the Ohio River.
b. Are we landing in. Washington, which is on the Potomac.
(Jackendoff, 1977)

Moreover, J. Emonds (1979) points out that neither clausal parentheticals nor appositive relatives permit a personal pronoun referring to their antecedents following $\bar{S}$-Attachment. To support this claim, he provides the examples in (67).

(67) a. $*$ Sue_i was working in that city_j, she_i said, for too little pay.
$*$ Sue_i was working in that city_j, her_i parents disliked it_j , for too little pay.
b. $*$ That sickness caused Mary_i, she_i concluded, to lose her job.
$*$ That sickness caused Mary_i, I liked her_i a lot, to lose her job.

In this case, the absence of personal pronouns in appositive relatives such as in (58-c) can be evidence that these constructions are in fact derived via $\bar{S}$-Attachment. Thus, no additional explanation is required for the contrast between (58-c) and (58-b) list in (61-c) under the main clause hypothesis. What remains to be addressed, however, is the obligatory presence of wh-forms in appositive relatives following the $\bar{S}$-Attachment operation as mentioned in (61-d). J. Emonds (1979) simply assumes that wh-forms are freely generated but can only be interpreted in certain structures. It suggests that appositive relatives, instead of parentheticals, permit wh-forms to be interpretable. Moreover, J. Emonds (1979) partially adopts Jackendoff (1977)'s idea of interpreting appositive wh-forms in his subordinate clause hypothesis (mentioned in (56)), which has been adapted in the following (68):

(68) Appositive Wh-interpretation
[PRO, WH] is anaphoric to H" in
$\text{H"}_{\bar{S}}[_{COMP}\text{[W \_ Z]S}]$
where $\bar{S}$ is immediately dominated by E.
(H=N, V, A, P)

According to Jackendoff (1977)'s subordinate clause hypothesis for appositive relative

clauses, a $\bar{S}$ forms an H"' with its antecedent (H"-$\bar{S}$ $\rightarrow$ H"') and a co-reference relation is posited between the H"' and PRO it properly contains. J. Emonds (1979) doubts this co-reference relation, arguing that it results in an unnatural interpretation. His Main Clause Hypothesis offers a more straightforward alternative by avoiding the need for such a relation altogether.

In all, appositive relatives are derived by applying parenthetical formation (59) and $\bar{S}$-Attachment (62) successively under J. Emonds (1979)'s main clause hypothesis.

De Vries (2002)'s Coordination Hypothesis

From the perspective of De Vries (2002), the syntactic status of appositions should be analyzed as coordinated constituents. There are three main types of coordination, which are elaborated in (69): conjunction, disjunction, and specification.

(69) a. Joop **and** Jaap (conjunction)
b. Joop **or** Jaap (disjunction)
c. the White House, **or** the house with the Oval Office (specification)

The option of coordinator distinguishes the three types of coordination. As shown above, the coordinator *and* implies that a coordinated definite DP denotes two different individuals, whereas in specifying coordination, there is only one individual *the house*. In the case of specifying coordination, the specification of A by B means that B adds information to A, and A can be either specific or generic. In this case, De Vries (2002) assumes that apposition is nonrestrictive and should be analyzed as a type of coordination, while restrictive interpretations are more appropriately represented through complementation. Moreover, specification tends to be asymmetric, which means that the second conjunct always specifies the first. The appositions share the same Case as that of the phrases they are attached to, which proves the plausibility of De Vries (2002)'s hypothesis. The examples are shown in (70):

(70) German

a. Du kennst doch den Jan und den Peter?
you know yet the-ACC Jan and the-ACC Peter
'You know Jan and Peter, don't you?'

b. Du kennst doch den Jan, meinen Cousin?
you know yet the-ACC Jan my-ACC cousin
'You know Jan, my cousin, don't you?'

Delorme and Dougherty (1972) and Halitsky (1974) hold the view that an apposition is actually a form of a reduced relative clause. Seen the example in (71):

(71) a. Annie, our manager.

b. Annie, who is our manager.

(71-a) is the representation of apposition, which is comparable to the corresponding appositive relative clause (71-b). In this case, De Vries (2002) assumes that an appositive relative, similar to an apposition, functions as a specifying conjunct to its antecedent. If it is on the right track, the appositive relative clause and its antecedent ought to form a constituent under the coordination approach.

(72) Dutch

a. Joop en Joep heb ik _ gezien. (Conjunction)
Joop and Joep have I _ seen
'I have seen Joop and Joep.'
∗ Joop heb ik _ en Joep gezien.

b. Annie, onze directrice, heb ik _ gezien. (Apposition)
Annie our manager have I _ seen
'I have seen Annie, our manager.'
∗ Annie heb ik _ , onze directrice, gezien.

c. Annie, die een dochter van drie heeft, heb ik _ gezien. (Appositive
Annie who a daughter of three has have I _ seen
Relative Clause)

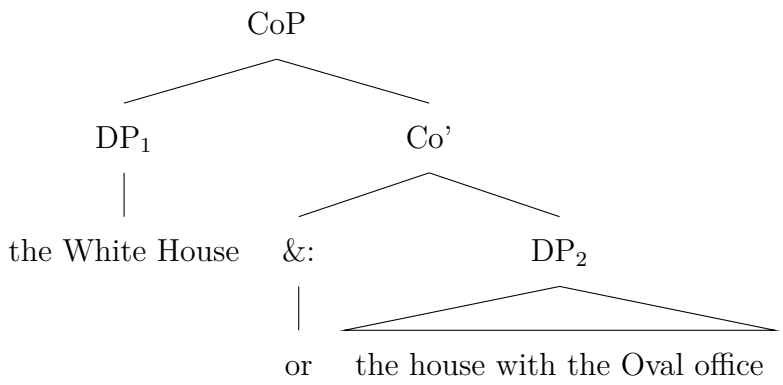
'I have seen Annie, who has a three-year-old daughter.'
∗ Annie heb ik _, die een dochter van drie heeft, gezien. (De Vries, 2002)

The above examples in (72) reflect constraints on coordinate structures, showing that specifying conjuncts and their antecedents cannot be separated by preposing one of the two. The violation shown in (72) implies that the coordination approach applies not only to appositions but also to appositive relative clauses.

Johannessen (1996) and Kayne (1994) suggest that the structure of coordination should be [$_{CoP}$ XP [$_{Co'}$ Co YP]], which is adopted by De Vries (2002). Based on this model, the structure of specification could be illustrated as the following (73):

(73) a. the White House, or the house with the Oval Office
[[$_{DP1}$ the White House] &: [$_{DP2}$ the house with the Oval Office]]

b.



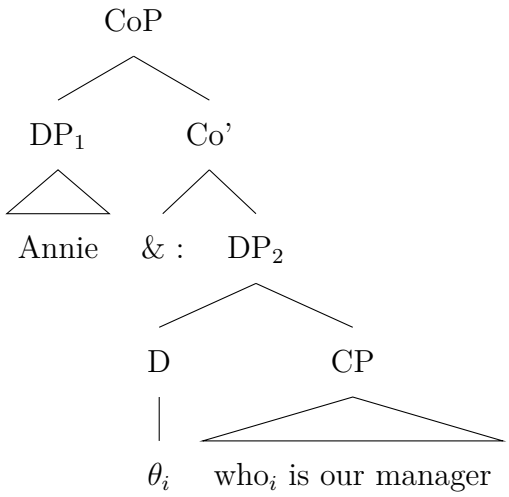
As shown in (73), the symbol &: is used to represent specifying coordination: & refers to the special instance of conjunction, and: refers to the specifying part. In De Vries (2002)'s proposal, DP_2 is the position for the appositive relative, and the position for its antecedent is DP_1. In order to support his hypothesis, De Vries (2002) further explains that the appositive relative should be analyzed as a type of free relative in apposition to the antecedent. Free relative clauses are embedded clauses introduced by a wh-expression, and they appear within nominal, adjectival, prepositional, or adverbial projection. The basic form of a free relative is [DP D^0[Free RC...wh]]. A formal illustration of this structure is provided in (74).

(74) I know [$_{RC}$ **who** won the competition].

To be specific, free relatives can be viewed as extended nominal projections that contain an embedded relative CP. It suggests that free relative clauses function as arguments, that is, as DPs. In this case, the coordination analysis can be applicable to free relative clauses since the free relative (DP) is able to be coordinated with another DP. If De Vries (2002)'s hypothesis is on the right track, as a kind of free relatives, appositive relatives can also function as DPs where the coordination structure is available. Thus, the first assumption made by De Vries (2002) is that an appositive relative clause forms a coordinated structure [$_{CoP}$[$_{DP}$[D NP] &:[$_{DP}$[ARC]]]] which is elaborated in (75):

(75) a. [[$_{DP1}$ Annie] & : [$_{DP2}$[$_{CP}$ who is our manager]]]

b.



In (75), DP_2 specifies DP_1. Thus, DP_1 and DP_2 share the same referent *Annie*. Within DP_2, the CP *who is our manager* modifies an abstract pronominal head θ. Although θ is empty here, it can sometimes be spelled out. For example, (75) can be rewritten as *Annie, or she who is our manager*. It means the connector *or* occupies the specifying conjunction position &: and the pronoun *she* occupies the empty pronoun θ position, which refers to the antecedent *Annie*. De Vries (2002) presents evidence (seen in (76)) that the appositive relative clause *who is our manager* is a DP instead of a bare CP.

(76) a. Marcelle est tre‘s fatigue’e, *ce* que Marie nest pas.
Marcelle is very tired DEM C_{rel} Marie NEG-is not
Marcelle is very tired, (something) which Marie is not.

b. Marcelle est arrive’een retard, *ce* quelle ne fait jamais.
Marcelle is arrived late DEM Crel-she NEG does never
Marcelle arrived late, (something) which she never does.

The above examples are taken from French appositive relatives, in which the determiner must be visible due to the absence of a visible DP antecedent. This phenomenon proves the plausibility of De Vries (2002)s hypothesis that an appositive relative is actually a DP.

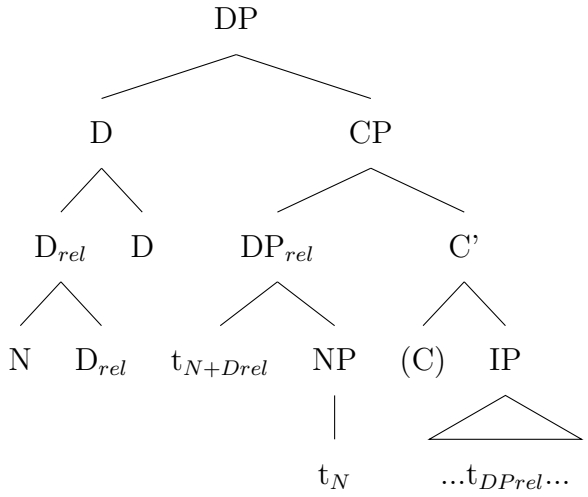
De Vries (2002) cites Dutch free relative clauses as illustrative examples and distinguishes between two types: the true free relative and the false free relative. Seen in (77):

(77) a. Wie zoet is krijgt lekkers (true free relative clause)
who sweet is gets sweets
'Sweets for the sweet.'

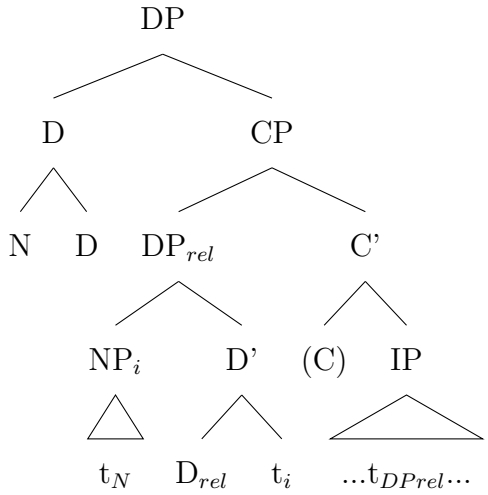
b. Degene/Hij die zoet is krijgt lekkers (false free relative clause)
the.one/he who sweet is gets sweets
Lit. 'He who is sweet, will get sweets.'

As shown above, the antecedent is implied in the relative pronoun *wie* 'who' in the true free relative clause (77-a). In contrast, the false free relative in (77-b) features an explicit antecedent, such as the pronoun *degene* 'one' or *hij* 'he'. The structural representations of these two types of free relatives are illustrated in (78) [2]:

(78) a. true free relative clauses



b. false free relative clauses



(78-a) and (78-b) reflect the derivation of true and false free relative clauses, respectively. In (78-a), N moves to D_{rel}, and then DP_{rel} undergoes wh-movement to Spec,CP. Finally, the complex N+D_{rel} moves to the external D, which gives the position for the relative pronoun like *wie* 'who' in (77-a). In contrast, the derivation of the false free relative clause resembles that of a restrictive relative clause. Firstly, the relative DP moves to Spec,CP, to do the wh-checking. Then, the NP, which corresponds to the antecedent in a restrictive relative, moves to Spec, DP_{rel} to agree with D_{rel}. Then, N moves to the external D to fulfill agreement and case-checking requirements. As said before, false free relatives are

[2] As mentioned in the previous chapter, De Vries (2002) supports the *raising approach* to relativization. Thus, all his hypotheses are formulated within this framework.

introduced by an overt pronominal element such as *degene* 'one' and *hij* 'he' in (77-b). Thus, the complex N+D here can be viewed as a kind of dummy antecedent.

Looking back at the appositive relative clauses ((71-b) is repeated here as (79), we can now reconsider their structure in light of the analysis of free relatives.

(79) Annie, who is our manager.

Combining the above analysis, De Vries (2002) further assumes that appositive relatives are best analyzed as instances of false free relatives. A key distinction between true and false free relatives is the properties of relative pronouns. In true free relatives, the pronoun functions as a free element, whereas in false free relatives, it is bound to an antecedent. In appositive relatives, the use of free relative pronouns is forbidden, which predicts that they are a kind of false free relatives. The contrast is shown in (80)

(80) Dutch

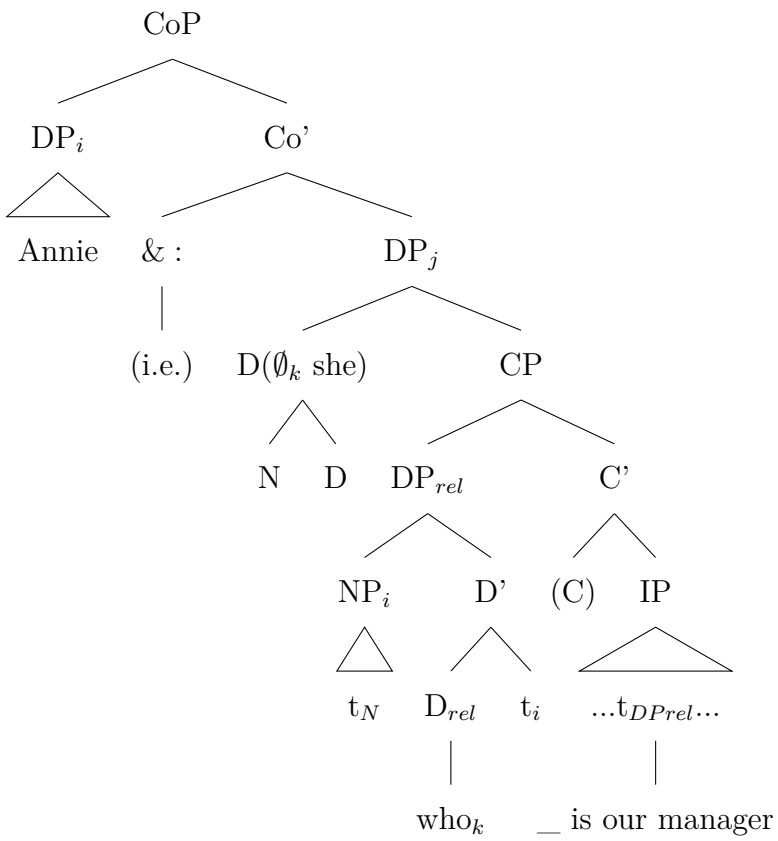
a. Wie jij kent (true free relative)
   Who you know
b. Degene die jij kent (false free relative)
   the.one who you know
c. Annie, die jij ook kent (appositive relative)
   Annie, who you also know

As seen above, the relative pronoun *wie* who can only be available in true free relatives, as seen in (80-a). While both the false free relative (80-b) and the appositive relative (80-c) use the relative pronoun *die* who. De Vries (2002) explains that the relative pronoun is a relative determiner in false free relatives and appositive relatives, whereas in true free relatives, D_{rel} is combined with an abstract antecedent to form a free pronoun.

To support his hypothesis, De Vries (2002) proposes that appositive relative clauses belong to false free relatives with empty pronominal heads. It is clear that the relative pronoun *who* does not contain an implied antecedent in the appositive relative clause, which suggests that the appositive relative is not a true free relative. The detailed structure of (79) is shown in (81):

(81) a. $[_{CoP}[_{DP}\ \text{Annie}]_i\ \&\ :\ [_{DP}\ \emptyset_k[_{CP}\ \text{who}_k\ \text{is our manager}]]_j]$

b.



Generally, the relative pronoun functions as a bound pronoun. However, an exception arises in the case of true free relatives. In such constructions, the NP is required to move to Spec,DP$_{rel}$ to agree with D$_{rel}$. Also, there is a coindexing relation built between $\emptyset$ and the relative pronoun *who*. The CP is selected by D, and the DP moves to Spec,CP for wh-checking. Finally, N moves to the empty external D to meet case and agreement requirements. This resulting complex, N+D, represents the (abstract) personal pronoun, which is marked as $\emptyset_{\ k}$ (she).

In all, the preliminary condition for the coordination analysis is that the two coordinated constituents must both be DPs, which enables one DP to be coordinated with the other. Thus, De Vries (2002) endeavors to demonstrate that appositive relative clauses are, in fact, DPs. To clarify their derivation, he categorizes them as a subtype of false free relatives. The surface structure of appositive relative clauses, then, results from syntactic requirements related to case and agreement. The following section will turn back to the core analysis of relativization illustrated in this research, the double-Headed hypothesis, in order to examine its application in appositive relative clauses.

4.5 Cinque's Idea of Appositive Relative Clauses

As discussed earlier in this chapter, appositive relative clauses can be derived through either movement or non-movement, suggesting that both the *raising* and *matching* ap-

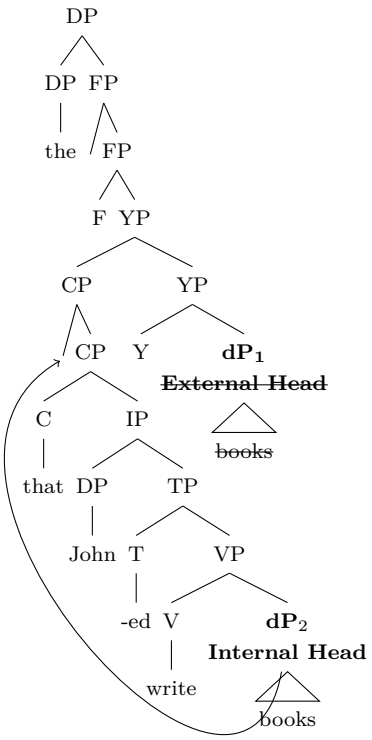
proaches can be applied to their analysis, as is the case with restrictive relative clauses. Although considerable evidence supports the *matching* approach, such as violations of Principle C, the lack of idiom chunk interpretation, constraints on scope assignment, and issues with quantifier and negative polarity item licensing, phenomena like extraposition and stacking in certain languages also support the plausibility of the raising approach in deriving appositive relatives.

In this case, the above-analyzing approaches to appositive relative clauses all have their own shortcomings, particularly in capturing the relation between the antecedent and appositive relative clause specifically. Smith (1964)'s D-complement hypothesis simplifies the derivation of appositive relative clauses, which regards it as a behavior of D-selection. It suggests that both appositive and restrictive relative clauses adjoin to the noun phrase, with co-indexing accounting for the relation among determiners, head nouns, relative pronouns, and clauses. The difference between these two types of relatives exists in the selection of determiners. Thus, it is not able to reflect the scope differences in these two structures. J. Emonds (1979)'s main clause hypothesis blocks the relation between appositive relatives and their antecedents. In his idea, they are independent and do not form a constituent. The shortcoming of this hypothesis is obvious that it is not able to explain a single relation between an antecedent and an appositive at all. Jackendoff (1977)'s subordinate clause hypothesis competes with the main clause hypothesis, which claims that an appositive relative clause forms a constituent with the phrase it modifies. However, this constituent may be discontinuous, meaning that transformations can only affect the linear order of elements without altering their underlying phrase-structural relations. As a result, the structural relationships encoded in the syntax of appositive relativization remain unaffected. Jackendoff (1977) only relies on a simple order-changing transformation—parenthetical placement, which cannot fully capture the structural nuances of appositive relativization.. De Vries (2002)'s coordination hypothesis compares appositive relatives with coordination structures, viewing appositive relatives as analogous to specifying coordination. This hypothesis admits that all appositive relative clauses are derived via *raising* rather than *matching*.

As analyzed before, Cinque (2020)'s *double-headed* structure is actually a kind of mixed approach to relativization, which combines the *raising* and *matching* hypothesis together. In Cinque (2020)'s idea, appositive relative clauses are classified into two main types (integrated and non-integrated) according to the relation between the head and relative clause. This division has been discussed earlier in this chapter; the present section offers a more detailed analysis of their derivation. Following Kayne (1994)'s idea that restrictive and non-restrictive relative clauses differ only at LF and not in their overt syntactic structure, Cinque (2020) proposes that the distinction between restrictives and non-restrictives lies in their merging position, rendering them syntactically indistinct on the surface. To illustrate, considerReviewing the relative clause *the books [that John wrote]*

in (51), and its derivation [3] under the *double-headed structure*, which is repeated here as the following (82):

(82)



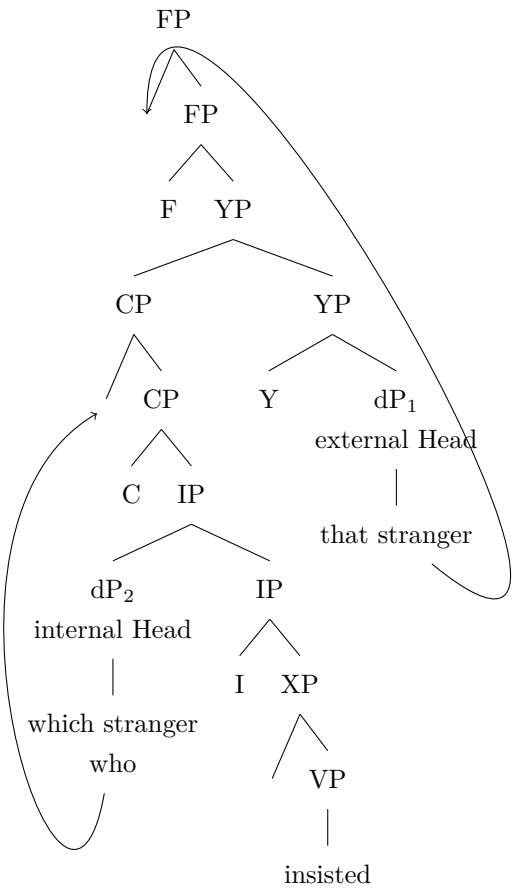
The raising derivation

According to the picture shown in (82), Cinque (2020) makes a hypothesis that restrictive relative clauses are merged as CPs in the specifier of a functional projection above the specifiers, which contains adjectives and numerals but below the projection containing determiners and demonstratives. However, non-restrictive relative clauses reflect the opposite case. Kayne (1994) and C. Lehmann (1984) suggest that non-restrictives are merged outside the scope of definite determiners and the demonstratives. Cinque (2020) generalizes that integrated non-restrictive relative clauses differ from restrictive ones in that the CP is merged in the specifier of a nominal projection that dominates the DP.

(83) a. That stranger, [who insisted].

[3]To be noticed, only the *raising* derivation case has been mentioned here. This sentence can also be derived by the *matching*, which is shown in (51).

b.

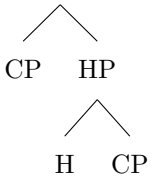


As to non-integrated non-restrictive relative clauses, the analysis would be much more tentative. *la quale* and *cui/che* relative clauses are typical representations of the non-integrated and integrated appositives, which have been discussed in the early section of this chapter. As shown in (16), non-integrated appositives are free of the adjacency requirement. Williams (1977) holds the view that the construction of non-integrated appositives belongs to the discourse grammar, rendering them immune to island constraints. It suggests that the pronoun can relate to its antecedent even when an island boundary intervenes. See the example in (84):

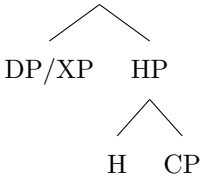
(84) Questa macchina, [per comprare la quale] Gianni si è indebitato fino al collo, ...
this car to buy which Gianni his is indebted up.to the ear
'this car, to buy which Gianni is up to his ears in debt,...'

In (84), the pronoun *la quale* relates to its antecedent *macchina* across the intervening adjunct *per comprare*. Cinque (2020) makes two possible structures for non-integrated appositives based on the hypothesis that they obey the discourse grammar. The illustration of these two structure is shown in (85):

(85) a.



b.



According to Cinque (2020)'s idea, (85-a) is for across discourse cases, while (85-b) represents instances in which the non-restrictive is adjacent to its antecedent. The example in (84) illustrates the former, across-discourse configuration. A representative example of the latter, adjacency-based structure can be found in (11-a), which is repeated here as (86):

(86) Maria è suscettibile. La qual cosa sua sorella di certo non è.
Maria is touchy which thing her sister of sure not is
'Maria is touchy. Which thing her sister certainly is not.'

Kayne (1994) assumes that the Linear Correspondence Axiom is also applicable to Discourse Grammar. If this hypothesis is on the right track, then linear precedence in discourse contexts should also reflect asymmetric c-command relations. In the case of non-integrated appositives, such asymmetric c-command can be achieved by merging the linearly preceding sentence in the specifier of a silent head, with the following sentence as its complement, which is illustrated in (85-a). Meanwhile, discourse fragments are not restricted to CPs. Just as shown in (86), the antecedent of a non-restrictive is AP, and as further demonstrated in examples such as (11), antecedents may also be DPs, CPs, and so forth. Thus, (85-b) represents the structure of this kind of non-integrated one. In both cases, an asymmetric c-command relation between the specifier and complement still exists. However, sentence-level grammatical operations such as Movement, Agree, and Binding are blocked by the intervening discourse grammar head H. Based on the above analysis, the movement internal within both types of non-integrated appositive CPs appears to target different positions than the movement found in integrated non-restrictives (and restrictives).

Up to now, the properties, classification, and analyzing approaches to appositive relative clauses have all been illustrated. There is no doubt that the application of the *double-Headed structure* helps the generalization of appositives. Mandarin Chinese reflects its specialty in the relativization of appositives, which will be analyzed in the following section.

4.6 Specialities of Appositive Relative Clauses in Mandarin Chinese

Revisiting the chapter that discusses the semantic typology of Mandarin Chinese relative clauses , the debate focuses on the existence of Mandarin Chinese appositives and the position in which they are interpreted. In the spirit of Del Gobbo (2010) and Lin et al. (2003)'s idea, relative clauses in Mandarin that modify proper names and pronouns can indeed be interpreted as appositive—contrary to the claim that Mandarin lacks appositive relatives altogether A typical example of this form, previously introduced in (57), is repeated here as (87):

(87) [$_{CP}$ hen ai chi niupai de] **Laowang** jintian que dian-le yupai
very love eat beef-steak DE Laowang today but order-Asp fish-steak
'(To our surprise), Laowang, who loves eating steak very much, ordered fish steak today'

Among all the discussions of Mandarin Chinese appositives, one point of consensus is that Chinese non-restrictive relative clauses do not exhibit the typical properties traditionally associated with appositive relative clauses.

One of the most prominent features of Mandarin Chinese appositive relative clauses is their prenominal position that the relative clause is prior to its antecedent . De Vries (2006), Del Gobbo (2003), and Potts (2004) argue for a cross-linguistic generalization that appositive relative clauses are postnominal. From a semantic perspective, Potts (2004) holds the view that non-restrictive relatives are distinct from restricitive ones not in syntactic structure, but in their contribution to meaning, specifically in their function as supplements to the main assertion. To be specific, appositives do not affect the at-issue entailed meaning of the sentence they embed in. In his idea, supplements are insensitive to linear order, which suggests that form [apposition, anchor] has the same meaning as the form [anchor, apposition]. Therefore, if prenominal relative clauses can meet the fundamental semantic definition above, they are possible to be interpreted as appositive. In (87), the prenominal relative clause *henaichiniupaide* 'who loves eating steak very much' does not affect the meaning of the whole sentence, suggesting that it may indeed function as an appositive relative clause De Vries (2006) follows Del Gobbo (2003) in

viewing appositive relative clauses as instances of E-type anaphora. Crucially, for E-type interpretations to hold, appositives must linearly follow their antecedents. This view is further supported by Turkish relative clauses cited in C. Lehmann (1984) (seen in (88)), which demonstrates that appositives must be post-nominal.

(88) a. Orhan-in gör-düg-ü adam cik-ti.
[Orhan-GEN see-NR-POSS3] man leave-PRET
The man who Orhan saw left.

b. Ben-i unut-ma ki san-a yardim et-ti-m.
I-ACC forget-NOT [that you-DAT help do-PRET-1]
Do not forget me, who helped you.

As shown above, the restrictive relative clause is pre-nominal (88-a) while the non-restrictive one should be post-nominal (88-b) in Turkish. De Vries (2006) further claims that the appositive pre-nominal relative may actually be a definite free relative followed by an apposition. The illustration of this structure is shown in the following (89):

(89) $[[_{DP}\ \mathrm{RC}_{FR}]\ \&:[_{DP}\ \mathrm{D\ NP}]]$ [4]

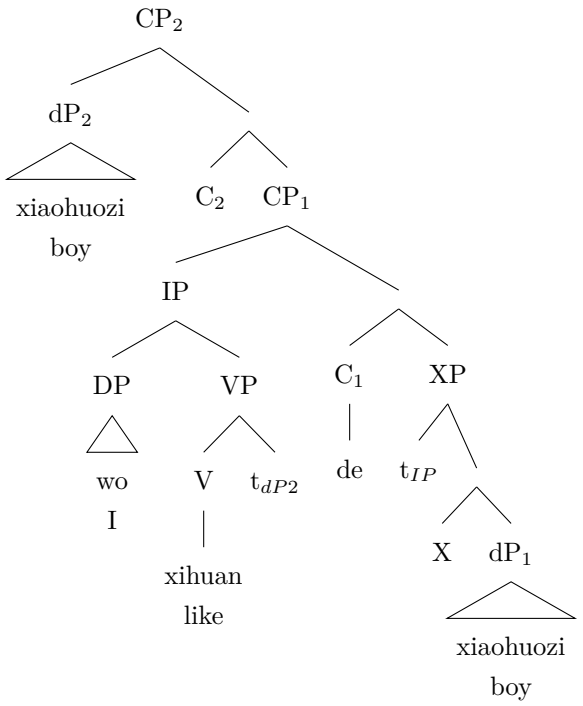
Obviously, there is no pre-nominal appositive relative in (89), but a post-nominal apposition can be tracked. However, Del Gobbo (2010) revisits and questions the claim made in Del Gobbo (2003), proposing an alternative derivation for Chinese pre-nominal relative clauses. This derivation is based on the uniform structure of relative clauses developed in Cinque (2008)[5]. Seen the following (90):

(90) a. wo xihuan de xiaohuozi
I like DE boy
'the boy I like'

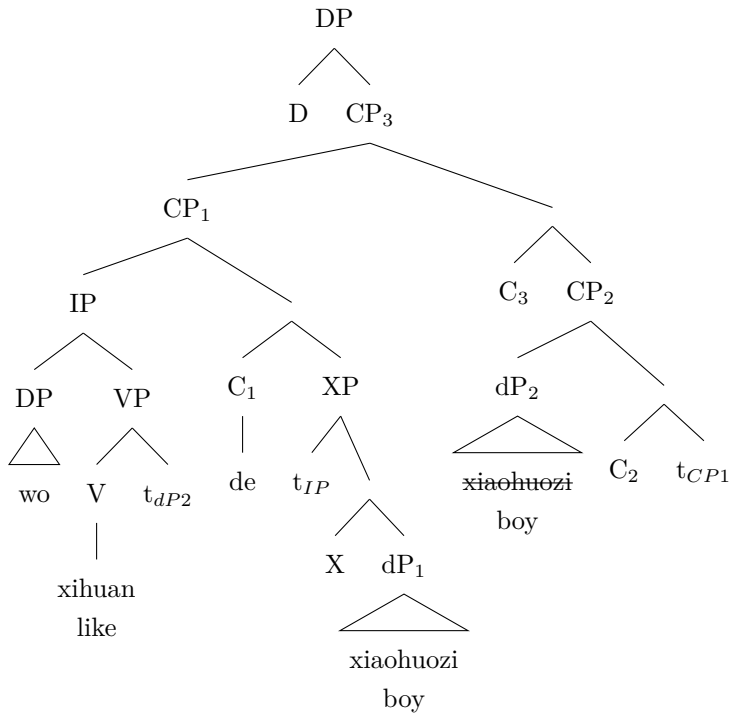
[4]The symbol & : is the phonological equivalent of a comma

[5]The earliest version of *double-headed* hypothesis can be traced back to the work of Cinque (2008). Cinque (2020) defines this uniform structure as the *double-headed* and makes a comprehensive comparison cross-linguistically

b.



c.



(90-b) and (90-c) reflect two possible derivations of Mandarin Chinese pre-nominal appositive relative clauses (90-a) separately, the former one is *raising* and the latter is *matching*. In both cases, Del Gobbo (2010) regards the relative element *de* as a non-root complementizer, which is marked in C_1 in the tree diagram. The IP is base-generated in the specifier of a functional projection, which dominates the external head dP_1 and moves to [Spec,CP] for licensing. Simultaneously, the internal head dP_2 moves to [Spec, CP_2]. In the raising case (90-a), dP_1 undergoes PF deletion, after which CP_1 raises. In contrast, in the matching case (90-b), CP_1 raises to [Spec,CP_3]. and dP_2 is deleted at PF due to

being cyclic c-commanded by dP_1. Not only Mandarin Chinese but also Japanese allows the existence of pre-nominal appositive relative clauses (seen the example in (91)):

(91) [$_{CP}$ Shuuron-o kaite i-ru Iwasaki-san]-ga sono gakkai-de
master's.thesis-ACC write be-PRES Iwasaki-HON-NOM the conference-at
happyo shi-ta.
presentation do-past
'Mr.Iwasaki, who is writing a master's thesis, presented a paper at the conference.'

In this case, it is reasonable to prove the availability of pre-nominal appositives cross-linguistically. As a distinct structural phenomenon, prenominal appositive relatives diverge from the canonical, postnominal appositive constructions in notable ways. The following section turns to an in-depth examination of Mandarin Chinese appositive relative clauses in particular, aiming to identify the properties of this unique prenominal appositive formation.

Categories of Antecedents

Normally, appositives can modify a broad range of antecedents, including PPs, APs, AdvPs, VPs, CPs, etc. These various types of antecedents can be seen in the previous analysis (3) (here is repeated as (92)) :

(92) a. Peter put it [$_{PP}$ under the table], [$_{Rel}$ where I had put it earlier].
b. Bill is [$_{AP}$ drunk] all the time, [$_{Rel}$ which is probably how you'd like to be].
c. John answered the question [$_{AdvP}$ politely], [$_{Rel}$which I thought was how he should have answered it].
d. John luckily [$_{VP}$ escaped], [$_{Rel}$which I unluckily didn't].
e. [$_{CP}$ The cheese was bought by John], [$_{Rel}$which was fortunate]. (Fabb, 1990)

However, the category of antecedents in Mandarin Chinese relative clauses is limited to nominals. Just as that in (90-a), the antecedent is the pronoun *xiaohuozi* 'boy'. Similarly, as shown in the appositive relative clause in (57), repeated here as (93), the antecedent is the proper name Laowang.

(93) [$_{Rel}$ hen ai chi niupai de] Laowang jintian que dian-le yupai
very love eat beef-steak DE Laowang today but order-Asp fish-steak
'(To our surprise), Laowang, who loves eating steak very much, ordered fish steak today.'

The violation reflected in (94) (95) (96) (97) proves that non-nominal antecedents are disallowed in Mandarin Chinese appositives.

(94) a. Wo [$_{PP}$ cong 1992 dao 1993] zai Beijing Yuyan Xueyuan xuexi Hanyu.
I from 1992 to 1993 in Beijing Language Institute study Chinese
Shijian tai duan le.
period too short ASP
'From 1992 till 1993 I studied Chinese at the Language Institute in Beijing. It was too short (a period of time).

b. ∗ Wo [$_{Rel}$ tai duan le de] [$_{PP}$ cong 1992 dao 1993] zai Beijing Yuyan
I too short ASP DE from 1992 to 1993 in Beijing Language
Xueyuan xuexi Hanyu.
Institute study Chinese
Int.:'From 1992 till 1993 I studied Chinese at the Language Institute in Beijing, which was too short (a period of time).

(95) a. Zhangsan hen [$_{AP}$ congming]. Lisi conglai jiu bu congming.
Zhangsan very smart Lisi ever just not smart.
Zhangsan is smart. Lisi never has been.

b. ∗ Zhangsan hen [$_{Rel}$ Lisi conglai jiu bu de] [$_{AP}$ congming].
Zhangsan very Lisi ever just not DE smart
Int.: Zhangsan is smart, which Lisi never was.

(96) a. Zhangsan [$_{VP}$ zai gaozhong zuo guo bianlun]. Lisi conglai meiyou zuo
Zhangsan in high.school do ASP debate. Lisi ever not do
guo.
ASP
Zhangsan debated in high school, which Lisi never did.

b. ∗ Zhangsan [$_{VP}$ Lisi conglai meiyou zuo guo de] [$_{VP}$ zai gaozhong zuo
Zhangsan Lisi ever not do ASP DE in high.school do
bianlun]
debate
Int.:'Zhangsan debated in high school, which Lisi never did.'

(97) a. Zhangsan hai meiyou lai. Zhe-jian shi shi Lisi hen shengqi.
Zhangsan yet not arrived this-cl fact make Lisi very mad
Zhangsan hasnt arrived yet. This bothers Lisi a lot.

b. ∗ [$_{Rel}$ Shi Lisi hen shengqi de] [$_{CP}$ Zhangsan hai meiyou lai].
make Lisi very mad DE Zhangsan yet not arrive
Int.:Zhangsan hasnt arrived yet, which bothers Lisi a lot.

In addition to restrictions on the category of antecedents, Mandarin Chinese appositives also show a difference in disallowing split antecedents. This phenomenon is explained explicitly in the next paragraph.

Illocutionary Independence

In the analysis of Cinque (2020), *il quale* appositive relative clauses in Italian can exhibit different illocutionary types, which can be declarative, interrogative and imperative from that of the matrix. However, the other type of appositives introduced by *che/cui*, pat-

terns like restrictive relatives in that they are limited to declarative interpretations. This distinction is shown in (99), (100) and (98):

(98) a. Gianni, il quale non è venuto a cena,...
Gianni the which not is come to dinner
Gianni, who didnt come to dinner,...

b. Gianni, che non è venuto a cena,...
Gianni that not is come to dinner
Gianni, who didnt come to dinner,... (Del Gobbo, 2010)

(99) a. Lunico che potrebbe è tuo padre, il quale potrà, credi,
the-only-one who could be your father the which will-be-able believe
perdonarci per quello che abbiamo fatto?
forgive-us for what that have done
'The only one who could is your father, who will ever forgive us, you think, for what we have done?'

b. ∗ Lunico che potrebbe è tuo padre, che potrà, credi,
the-only-one who could be your father that will-be-able believe
perdonarci per quello che abbiamo fatto?
forgive-us for what that have done
Int.:'The only one who could is your father, who will ever forgive us, you think, for what we have done?'

c. ∗ Questa è la sola persona che potrà, credi, perdonarci per
this be the only person that will-be-able believe forgive-us for
quello che abbiamo fatto? (restrictive)
what that have done
Int.'This is the only person that will he ever manage to forgive us, you think, for what we have done?' (Cinque, 2008, 2020)

(100) a. Ci sono poi i Rossi, per i quali, ti prego, cerca di trovare una
there be then the Rossi for who you please try to find an
sistemazione!
accommodation
'There are then the R.'s, for whom please try to find an accommodation!'

b. ∗ Ci sono poi i Rossi, per i quali, ti prego, cerca di trovare
there are then the Rossi for that you please try to find
una sistemazione!
an accomodation
Int.:'There are then the R.'s, for whom please try to find an accommodation!'

c. ∗ Sono loro le sole persone per cui cerca di trovare una
be they the only person for that please to find an
sistemazione! (restrictive)
accommodation
Int.' It's them the only people for whom please try to find an accommodation!' (Cinque, 2008, 2020)

(98) reflect the fact that both *il quale* and *che/cui* appositives allow the declarative type. The violation of (99-b) and (100-b) proves that *che/cui* appositive relative clauses cannot be either interrogative or imperative like restrictives shown in (99-c) and (100-c). In comparison, Mandarin Chinese appositive relative clauses pattern similarly with *che/cui* relatives in Italian, as they also disallow illocutionary independence. This restriction is demonstrated in the Mandarin interrogative example provided in (101).

(101) a. Zhangsan juedui bu hui zheme zuo. Ta hui bu hui yuanliang
Zhangsan absolute not able this way he able not able forgive
women?
us?
'Zhangsan could never behave this way. Will he forgive us?'

b. Zhangsan juedui bu hui zheme zuo. Ta hui yuanliang women ma?
Zhangsan absolute not able this way he able forgive us Q
'Zhangsan could never behave this way. Will he forgive us?'

Example (101) reflects two ways of interrogation in Mandarin Chinese, where (101-a) is a yes-no question and (101-b) is a wh-question. In (101-a), *hui bu hui* 'able not able' is the form of an A-not-A question. In (101-b), the sentence-final particle *ma*, marking a wh-question. Following this, (102) demonstrates how these interrogative constructions are transformed into relative clauses.

(102) a. ∗ [Hui bu hui yuanliang women de] Zhangsan juedui bu hui
able not able forgive us DE Zhangsan absolute not able
zheme zuo
this.way do
Int.:'Zhangsan never behaves this way, by whom will we be forgiven for what we have done?'

b. ∗ [Hui yuanliang women ma de] Zhangsan juedui bu hui zheme
able forgive us Part. DE Zhangsan absolute not able this.way
zuo
do
Int.:'Zhangsan never behaves this way, by whom will we be forgiven for what we have done?'

In (102), the relative element *de* is used to relativize the interrogative clause where *Zhangsan* (a proper name) is the antecedent. The failure of this transformation reflects that appositives modifying a proper name in Mandarin Chinese cannot be interrogative. Del Gobbo (2010) suggests a possible exception to this constraint, proposing that appositive relative clauses in Mandarin Chinese can be interrogative when the antecedent is a pronoun (seen in (103)).

(103) ni zui xihuan shenme shihou kan-qi-lai de ta?
you most like what time see-lift-come DE she

'When do you most like the appearance of her?'

However, Del Gobbo (2010) further explains that the grammaticality of (103) is due to the wide scope of the wh-word *shenme shihou*. It suggests that (103) conveys the meaning 'when is the time x such that you like the appearance of her at time', where the interrogative force applies to the entire clause rather than being restricted to the embedded appositive. If the wh-word is embedded in the relative clause, only the indefinite reading (104-a) or the ungrammatical sentence (104-b) would be received.

(104) a. Ni na-ge [shenme shihou zou-diu] de baba juedui bu hui
you that-Cl what time walk-lost DE father absolute not able
zheme zuo.
this.way do
That father of yours, who got lost sometime ago, would never do something like this.

b. ∗ Wo xihuan qu nali de Zhangsan.
I like go where DE Zhangsan
Int.: I like Zhangsan, who went where?'

If appositive relative clauses in Mandarin Chinese could be interrogative, then the wh-word must take scope over the relative clause. This rule could also explain the previous example (102-b) where the wh-word *ma* is the final particle, which is restricted to matrix clauses and cannot be available in embedded clauses. As to A-not-A questions in Mandarin Chinese, C. J. Huang et al. (2018) believes that when such forms are embedded within syntactic islands (such as relative clauses), a direct interrogative interpretation is blocked. Moreover, he further claims that if the island clauses are selected by appropriate verbs or nouns, an indirect-question interpretation would be available (seen in (105)).

(105) Wo xiang taolun [ta lai bu lai de wenti].
I want discuss he come not come DE question
I want to discuss the question of whether he comes or not.

In (105), the A-not-A question *lai bu lai* 'come not come' selects the appropriate noun *wenti* 'question', which enables an indirect question interpretation. *hui bu hui* 'able not able' in (102-a) cannot take wide scope due to the wrong word *zhangsan* (a proper name) has been selected. Thus, the violation can be found in (102-a). To summarize, appositive relative clauses in Mandarin Chinese cannot be interrogatives. The next part addresses another constraint: the unavailability of split antecedents in Mandarin Chinese appositives.

Split Antecedents

The issue of split antecedents in appositive relative clauses has already been discussed in former sections as one of the key distinctions between integrated and non-integrated appositives. The earliest discussion of split antecedents in relativization can be traced back to Perlmutter and Ross (1970), who acknowledges the possibility of such constructions.

(106) a. John saw a man$_i$ and Mary saw a woman$_j$ who$_{i+j}$ were wanted by the police.

b. Mary met a man$_i$ and John met a woman$_j$ who$_{i+j}$ knew each other well.

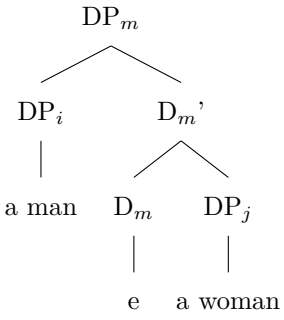
In (106), the antecedents of the relative clause are split into two DPs: *a man* and *a woman*, which are distributed in two matrix clauses, respectively. In (106-a), both antecedents are singular while the relative pronoun *who* triggers the plural form *were* instead of the singular *was*, indicating their collective interpretation. In (106-b), the relative pronoun *who* functions as the subject of the collective predicate *knew each other well*, reinforcing the idea of a combined referent. N. N. Zhang (2007) defines this construction as a Split Antecedent Relative Clause Construction, which is derived by sideward movement. In his analysis, the split antecedents in relativization are naturally a single-coordinate DP complex.

(107) a. $*$ A man entered and the woman left who met last year.

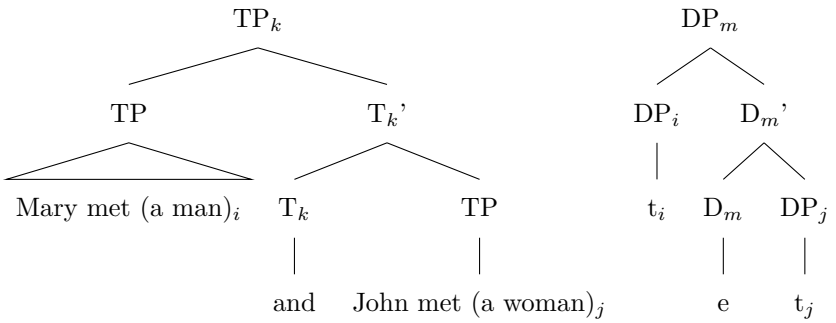
b. A man$_i$ entered and the woman left who met him$_i$ last year.

As shown in (107), the violation of (107-a) is that the nominals *a man* and *the woman* do not form a consistent set of specificity features for the relative clause. It suggests that there are two different nominals functioned as the Heads in (107-a), which blocks the predication relation between the Heads and the relative clause. In contrast, (107-b) presents a grammatical structure, where the relative clause is the predicate of the nominal *the woman*, thereby ensuring interpretive consistency. This contrast supports the previous hypothesis that even in cases involving split antecedents, only one nominal element functions as the syntactic Head of the relative clause. Based on it, N. N. Zhang (2007) illustrates a derivation for Split Antecedent Relative Clause Constructions (seen in (108)).

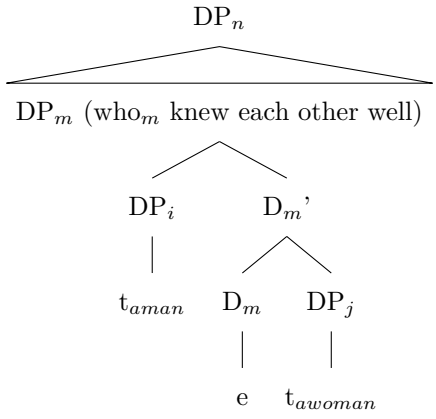
(108) a.



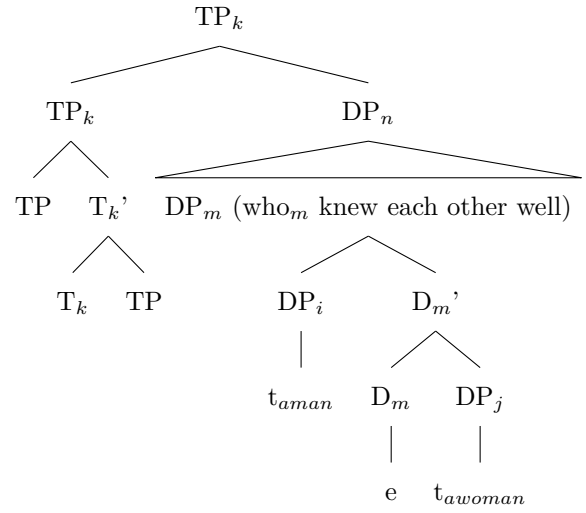
b.



c.



d.



The whole derivation can be divided into four steps, corresponding to (108-a), (108-b), (108-c) and (108-d) . In (108-a), the null conjunction *e* coordinates the antecedents *a man* and *a woman*, forming a coordinate nominal DP$_m$. In the next step (108-b), the DPs *a man* and *a woman* undergo sideward movement and are each selected by the verb *met* . Thus, the TPs *John met a woman* and *Mary met a man* are constructed. These two TPs , together with the conjunction *and*, form a coordinate clausal complex, labeled TP$_k$. (108-c) originated from (108-a), and a complex nominal DP$_n$ *who$_m$ knew each other well* is constructed here. This DP$_n$ contains the relative clause and its antecedent (the remnant DP$_m$). Finally, in (108-d), the previously formed DP$_n$ adjoins to TP$_k$, yielding the final structure. It is obvious that the movement of DP$_i$ *a man* and DP$_j$ *a woman* are two cases of sideward movement in this derivation. These two chains of are subject

to strict parallelism requirements. Firstly, both chains must originate from conjuncts and terminate in conjuncts. The second is that two DPs must be in similar syntactic positions. It means they are required to share similar thematic features. In other words, two DPs need to share the same theta-role. Any violation of these conditions results in ungrammaticality, as demonstrated in (109).

(109) a. $*$ After Mary met a man$_i$, John met a woman$_j$ who$_{i+j}$ knew each other well.

b. $*$ A man$_i$ met Mary and John met a woman$_j$ who$_{i+j}$ knew each other well.

In (109-a), the two nominals *a man* and *a woman* do not appear in any conjuncts, violating the parallelism requirement. In (100-b), *a man* occupies the subject position while *a woman* is in the object position, resulting in asymmetry in syntactic position and theta-role assignment. Thus, neither of them are satisfied with the necessary conditions for sideward movement. N. N. Zhang (2007) further proposes that sideward movement occurs before the antecedent DP merges with the relative pronoun, which allows this movement to be compatible with either *raising* or *matching* analysis of relative clauses. Based on this sideward movement within relativization, further consideration comes to the analysis of Mandarin Chinese appositives where only inter-sentential antecedents are available. See the comparative sentences in (110).

(110) a. $*$ Op$_{i+j}$ bu xihuan Xiaoyu de Zhangsan$_i$ jinlai le Lisi$_j$ zou le
not like Xiaoyu DE Zhangsan enter Asp Lisi exit Asp
Int.: The Zhangsan that doesnt like Xiaoyu entered, Lisi went out

b. fenbie dou ai guo Xiaoyu de Zhangsan$_i$ jiagei le Wangwu,
separately all love Asp Xiaoyu DE Zhangsan marry to Asp
Lisi$_j$ jia gei le Houliu
Wangwu, Lisi marry Asp Houliu
Zhangsan$_i$ married Wangwu and Lisi$_j$ married Houliu who$_{i+j}$ both had loved Xiaoyu.

In (110-a), the appositive relative clause is syntactically attached to *Zhangsan* but semantically refers to both *Zhangsan* and *Lisi*, resulting in ungrammaticality. This violation arises because only Zhangsan serves as the syntactic antecedent, while the semantic interpretation relies on a split antecedent structure. In contrast, the split antecedents *Zhangsan* and *Lisi* share the same theta-role, which makes (110-b) grammatical. This comparison in (110) reinforces the constraints proposed for the Split Antecedent Relative Clause Construction. However, Italian *il quale* appositive relative clauses is an exception, which allows split antecedents to own different theta roles (seen in (111)).

(111) Se Carlo$_i$ non amava più Anna$_j$, i quali$_{i+j}$ daltra parte non
if Carlo not love any-longer Anna who on.other side not
si erano mai voluti veramente bene, una ragione cera.
Recipr. were ever wanted really well a reason there.was
If C. was no longer in love with Anna, who at any rate never really loved each other, there was a reason.

In (111), it is obvious that the two antecedents *Carlo* and *Anna* are in different syntactic positions, which means they are impossible to share the same theta-role. Despite this, (111) remains grammatical, seemingly violating the constraints set forth by the Split Antecedent Relative Clause Construction. To explain this phenomenon, the division of appositive relative clauses, which is analyzed at the beginning of this part, needs to be reviewed. There are two types of appositive relative clauses: integrated appositives and non-integrated ones. The former behaves similarly to restrictive relative clauses, while the latter is governed by discourse grammar. The *il quale* appositive, as a non-integrated one, is exempt from certain movement constraints. To clarify the relation between the Head and the appositive relative clause, the next paragraph focuses on the binding relation in relativization.

Binding

As discussed in previous paragraphs, it is obvious that Mandarin Chinese appositive relative clauses have limitations on the category of antecedents and types of illocutionary . Also, the antecedents of Mandarin Chinese appositives are required to share the same theta-role if they are split. These features suggest that Mandarin Chinese appositives behave similarly to integrated ones. However, they also exhibit a unique aspect in terms of the binding relation between the Head and appositive relative clause. Normally, the binding of a pronoun inside the appositive by a quantified nominal in the matrix is not allowed in integrated appositives.

(112) a. $*$ [Every Christian]$_i$ forgives John, who harms him$_i$. (Safir, 1986)

b. $*$ [Ogni studente]$_i$ detesta la professoressa Rossi, [che/la quale lo$_i$
every student hates the professor Rossi that/the which him
rimprovera sempre].
scolds always
Int.:'Every student hates Professor Rossi, who always scolds him.' (Del Gobbo, 2017)

c. [Mei yi-ge xuesheng]$_i$ dou wang-bu-liao na yi-ge [bangzhu guo tai
every one-Cl student all forget-not-can that one-Cl help Asp him
de] Niu laoshi.
DE Niu professor
$*$No student can forget Prof. Niu, who helped him. (Del Gobbo, 2017)

The examples shown in (112) cited from English, Italian, and Mandarin Chinese appositives, respectively, demonstrate that only Mandarin Chinese appositives allow the binding of pronouns and quantified nominals. The possibility of this binding distinguishes Mandarin Chinese appositives from normal integrated type. In this case, the classification of appositive relative clauses must be refined further, which will be elaborated in the next paragraph.

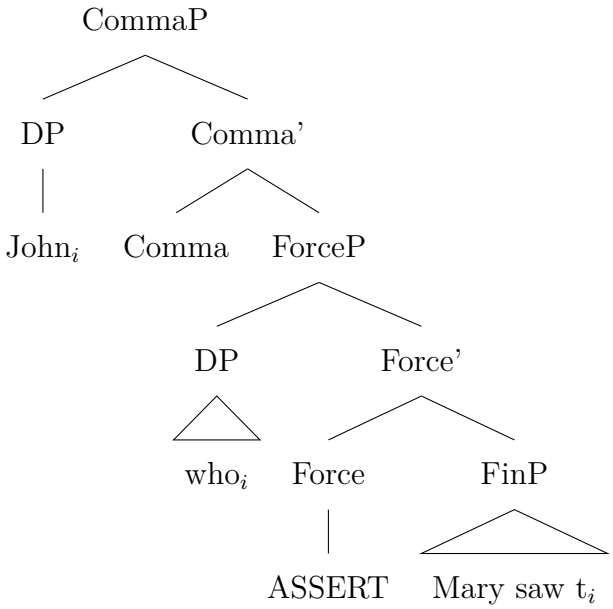
Fully-integrated Appositive Relative Clauses in Mandarin Chinese

Based on the previous analyses, Mandarin Chinese appositive relative clauses show their properties in in terms of antecedent categories, illocutionary independence, split antecedents, and binding. Del Gobbo (2017) specifies integrated and non-integrated appositives, arguing that the integrated one includes both semi-integrated and fully integrated cases. The Mandarin Chinese appositive represents the fully integrated typology. A detailed illustration of this will be shown below.

The assumption made by Del Gobbo (2017) is that non-integrated and semi-integrated appositive relative clauses involve a CommaP projection, which is not available in integrated ones. Moreover, he suggests that a ForceP projection can be found in non-integrated appositive relative clauses, following Koev (2013), which sets them apart from semi-integrated appositive clauses. Potts (2004) proposes that appositive relative clauses project a CommaP if there is an intonational break.

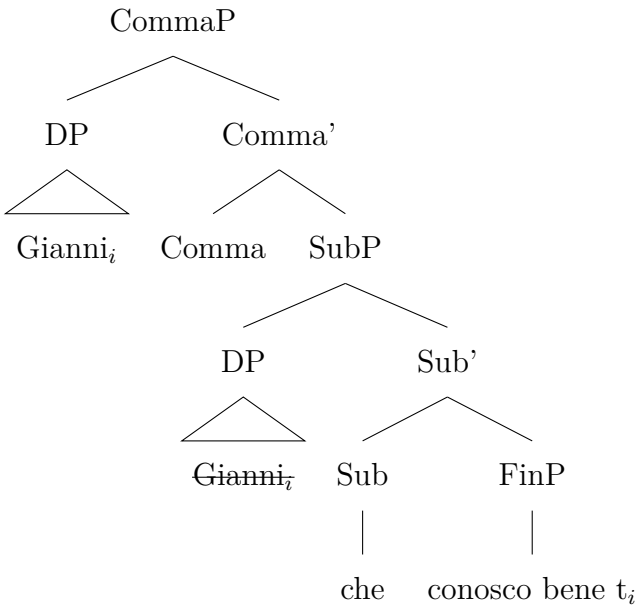
(113) a. John, [$_{CP}$who Mary saw].

b.



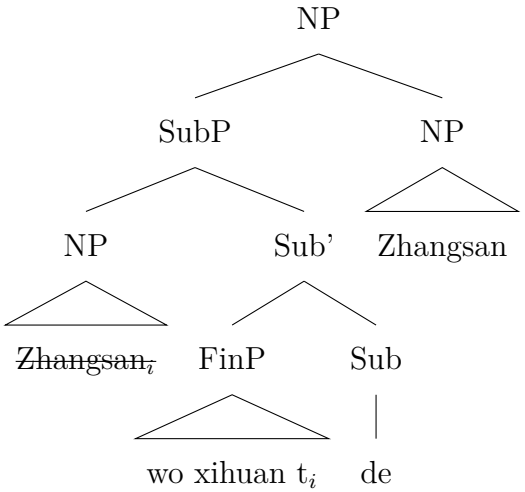
c. Gianni [$_{CP}$ che conosco bene].
Gianni that I-know well
'Gianni, who I know well.'

d.



e. wo xihuan de Zhangsan
I like DE Zhangsan
'Zhangsan, who I like.'

f.



(113) illustrates the structure of three types of appositive relative clauses: the non-integrated one in English, the semi-integrated one in Italian, and the fully-integrated one in Mandarin Chinese. The Force projection contains the speech act operator. Del Gobbo (2017) proposes that ForceP allows appositive relative clauses to contribute a different illocutionary force from that of the host clause, which explains why only non-integrated appositives allow illocutionary independence. Koev (2013) suggests that Comma introduces a variable for the content of the constituents within its scope. In this case, it is reasonable to explain that binding elements from the matrix clause into the appositive is impossible in the presence of the Comma. To be specific, quantifiers in the matrix clause do not bind the appositive with Comma because they are relativized to different propositional variables. Heim (1990) argues that the relative pronoun is a copy of the antecedent

at LF. Following this idea, Del Gobbo et al. (2007) claims that the relative pronoun is an E-type pronoun that requires to coindex with the antecedent. Sells (1985) and Potts (2002) argue that E-type pronouns can pick up the reference of any syntactic category. This means that the existence of relative pronouns allows for the splitting of antecedents and various categories of antecedents. In the non-integrated case (113-b), the Comma, Force, and relative pronoun enable illocutionary independence, allow for split and various antecedent categories, but prohibit binding. In the semi-integrated one like (113-d), different from the non-integrated one, where ForceP is substituted by SubP, leading to the unavailability of illocutionary independence. In contrast, the fully-integrated case (113-f), which lacks relative pronouns, Comma, and Force, restricts the split antecedents and categories of antecedents. However, binding is available here. The lack of relative pronouns in Mandarin Chinese appositives also explains why split antecedents here can only be inter-sentential. In all, Mandarin Chinese appositives represent fully integrated appositives, which are distinct from the normally defined integrated appositive relative clauses.

4.7 Conclusion

This chapter focuses on appositive relative clauses and provides a general overview of their properties in Mandarin Chinese.

Given that appositive/non-restrictive and restrictive relative clauses exhibit both similarities and differences in their syntactic structures, the chapter begins with a comparative analysis aimed at identifying the unique features of appositives.

Appositive and restrictive relative clauses behave differently in terms of antecedent selection and the types of relative elements, which are two essential items in relativization. Appositive relative clauses are free of the category of antecedents but are restricted to definite antecedents. In contrast, restrictive relative clauses typically impose stricter constraints on the syntactic category of antecedents but allow indefiniteness. Despite these contrasts, both types of relative clauses can be introduced by relative pronouns or complementizers.

With respect to the relation between the antecedent and the relative clause, appositive relative clauses, like that restrictive ones, exhibit syntactic phenomena such as extraposition, stacking, Principle C violations, lack of idioms interpretation, scope assignment, and case mismatch. These patterns suggest that both movement and non-movement of heads are possible in the formation of appositive relative clauses. However, appositives show their distinctions in scope assignment and the license of quantifiers and negative polarity items. In appositives, the scope is determined by the whole antecedent DP instead of the partial antecedent (a determiner or quantifier). This restriction implies that relativized noun phrases cannot independently receive scope in appositive constructions. Moreover,

the license of quantifier and negation is blocked in appositives. These two restrictions traced in the formation of appositives make the *raising* analysis problematic. In other words, the combination of *raising* and *matching* analysis is essential to adequately account for their derivation.

After confirming the possibility of both *raising* and *matching* approaches in the derivation of appositives, the following section turns to the structural analysis of appositives. In the literature, analyses of appositive relative clauses can be divided into two main types. One is the constituency approach, represented by proposals such as Smith (1964)'s D-complement hypothesis, Jackendoff (1977)'s subordinate hypothesis, De Vries (2002)'s coordination hypothesis, which admits that the antecedent and the appositive relative clause form a syntactic constituent. Another while the other one is the orphanage approach, exemplified by J. Emonds (1979)'s main clause hypothesis, which posits that the antecedent and the appositive are generated independently. Due to the close relation between the antecedent and its relative clause, the constituency approach appears more suitable for analyzing appositive relative clauses. Cinque (2020) generalizes appositive relative clauses into his *double-headed structure*, which further divides appositive relatives into two types: integrated and non-integrated. This distinction accounts for certain derivational differences observed in appositive relative clauses.

As a special kind of appositives, Mandarin Chinese relative clauses challenge Cinque (2020)'s *double-headed structure*. The pre-nominal form of appositive relative clauses in Mandarin Chinese disallows illocutionary independence and limits the category of antecedents. However, these constructions permit inter-sentential split antecedents as well as the binding of pronouns and quantified nominals. These properties set Mandarin appositives apart from both integrated and non-integrated types as traditionally defined. Thus, Del Gobbo (2017) introduces a finer classification within the integrated type, distinguishing between semi-integrated and fully-integrated appositives. Under this framework, Mandarin Chinese appositive relative clauses represent fully-integrated ones.

Up to now, the basic structure of Mandarin Chinese relative clauses and the special characteristics of appositive relative clauses have been specifically analyzed. The following chapter will develop further into the issue of resumption in relativization. As a relativization strategy, resumptive pronouns in Mandarin Chinese exhibit unique characteristics. Analyzing these features contributes to a broader understanding of resumption in relativization.

Chapter 5

Resumption in Relativization

5.1 Introduction

In the literature, resumptivity has been widely discussed at both the syntactic and semantic levels. As a morphologically full pronoun, the resumptive pronoun distinguishes itself from the empty category and shares some similar properties with the wh-trace. Resumptive pronouns can be traced in variable positions within A'-chains, which suggests that they behave semantically like variables. There are two main A-dependencies: one is relatives, and the other is dislocation. In general, different types of A'-dependencies arise from different syntactic mechanisms. This chapter focuses on the analysis of resumption in relative clauses, aiming to identify the general properties of resumptive pronouns and to better illustrate the derivation of relative clauses.

As mentioned in chapter two, resumptive pronouns are considered a strategy for relativizing the internal Head under Cinque (2020)'s *double-Headed structure*. However, Cinque's proposal does not provide a detailed account of the internal composition of the two Heads, which creates challenges in analyzing the conditions under which resumptive pronouns appear. This chapter aims to address this gap by refining the general *double-headed structure* through the lens of *multi-dominance* theory.

The chapter is organized into two main sections. The first section focuses on the different types of resumptive pronouns and their derivation. The second section illustrates the properties of resumptive pronouns in Mandarin Chinese relative clauses, arguing that these resumptives represent a type of 'weak' resumptive pronoun that must coexist with definite head nouns.

5.2 Analyses of Resumptive Pronouns

The term *resumptive pronouns* derives from the observation that the elements fulfilling a resumptive function are invariably pronominal in nature. Their general distribution is

exemplified in the following (1):

(1) a. I just saw a girl$_i$ [who$_i$ Long Johns claim [that **she**$_i$ was a Venusian]] made all the headlines. (J. R. Ross, 1967)

b. Mary$_i$, I love **her**$_i$ very much.

c. It was a luxurious house$_i$ that they live in **it**$_i$.

d. cén t-oigigeach$_i$ ar shíl tú go mbeadh **sé**$_i$ i láthair?
which officer COMP$_{pro}$ thought you COMP would-be he in presence
Which officer did you think would be present? (McCloskey, 1990)

e. As for this book$_i$, [[I only read **it**$_i$ once] but [Mary read **it**$_i$ at least four times]] .

Resumptive pronouns are only available in A'-dependencies like relative clauses (1-a), left-dislocation structures (1-b), cleft-focus structures (1-c), wh-questions (1-d) [1], and Across-The-Board (ATB) constructions (1-e). It is obvious that resumptive pronouns have a deep influence on the formation of A'-dependencies. This chapter focuses on relative constructions to provide a comprehensive account of resumptivity in relativization, which contributes to a systematic analysis of resumptive pronouns. The first question to be addressed is the classification of resumptive pronouns, given that they behave differently in relativization.

5.2.1 Types of Resumptive Pronouns

Existing research on resumption makes a general distinction between two types of resumptive pronouns, which are real and intrusive resumptive pronouns. In some accounts, real resumptive pronouns are also referred to as grammatical ones, or as instances of the grammatical or systematic use of resumptive pronouns. At the same time, intrusive resumptives are associated with the intrusive use of resumptive pronouns. The following sections will focus on analyzing the distinctions between these two two types in the context of relativization.

Real (Grammatical) Resumptive Pronouns

Grammatical resumptive pronouns tend to appear systematically in an A'-bound position. Based on this property, Borer (1984), Koopman (1983), and Zaenen et al. (1981) suggest that resumptive pronouns and gaps can be free alternatives. See the examples in (2):

(2) a. raiti et ha-yeled e-rina ohevet **oto**.
saw-I Acc the-boy that-Rina loves him

[1] Pan (2016) proposes that resumptive pronouns are prohibited in wh-trace positions in English, whereas McCloskey (1990) suggests that resumptive pronouns can be traced in wh-questions. Thus, (1-d) is taken from Irish wh-questions.

I saw the boy that Rina loves.

b. raiti et ha-yeled e-rina ohevet _.
saw-I Acc the-boy that-Rina loves
I saw the boy that Rina loves. (Sells, 1984)

The examples in (2) are cited from Hebrew relative clauses. The acceptability of both (2-a) and (2-b) suggests that the resumptive pronoun *oto* 'him' is optional in relativization. However, intrusive resumptive pronouns reflect the opposite case, as they cannot be freely substituted with gaps. A detailed analysis of this contrast will be presented in the following part.

Intrusive Resumptive Pronouns

Intrusive resumptive pronouns differ from real ones, which are obligatory in relativization. They are always used as a last resort to prevent a sentence from eventually violating locality constraints, such as Subjacency and the Empty Category Principle(ECP), in island contexts. To make a comparison with the optional existence of resumptive pronouns (seen in (2)), the examples in (3) are also taken from Hebrew relative clauses [2].

(3) a. raiti et ha-yeled e dalya makira et ha-ia e ohevet **oto**.
saw-I ACC the-boy that Dalya knows ACC the-woman that loves him
I saw the boy$_i$ [that Dalya knows the woman [that loves him$_i$]].

b. $*$ raiti et ha-yeled e dalya makira et ha-ia e ohevet _.
saw-I ACC the-boy that Dalya knows ACC the-woman that loves
Int:I saw the boy$_i$ [that Dalya knows the woman [that loves _$_i$]].

In contrast to the optional presence of the resumptive pronoun oto him in (2), its absence in (3-b) results in ungrammaticality. It is obvious that *oto* 'him' is used intrusively in (3-a) to avoid a potential violation of locality constraints. As shown in (3), there are two relative clauses: ' the boy that Dalya knows...' and 'the woman that loves'. The former is the outer relative clause, and the latter is the inner one. The outer relative clause forms an island that blocks the relativization of the noun phrase *the boy*, thereby violating Subjacency. In (3-a), the insertion of the resumptive pronoun *oto* 'him' saves the sentence by circumventing this locality violation. The contrast between the optional use of *oto* 'him' in (2) and its obligatory use in (3) clearly indicates that these resumptive pronouns serve distinct grammatical functions.

In this section, a brief illustration is given for the two main types of resumptive pronouns. Due to their different grammatical functions, resumptive pronouns have been divided into real (grammatical) and intrusive ones. This typological distinction sets the stage for a deeper analysis of the derivation of resumptive pronouns, which will be analyzed in the following section.

[2]In Hebrew relative clauses, both real and intrusive resumptive pronouns are available.

5.2.2 The Formation of Resumptive Pronouns

As analyzed in the previous section, real (grammatical) and intrusive resumptive pronouns play different functions in relativization. This functional divergence lends support to the hypothesis that different derivational mechanisms underlie their usage. Accordingly, this section focuses on the formation of resumptive pronouns.

According to the work of Chomsky (1993), the reconstruction effect is an efficient diagnostic tool for determining whether an A'-dependency is derived by movement. Aoun et al. (2001) explores this correlation by examining resumptive constructions, observing that some resumptive pronouns exhibit reconstruction effects while others do not.. In contrast, Guilliot and Malkawi (2006) tries to dissociate movement from reconstruction effects. In his work, copies can be analyzed as either indefinite or definite descriptions. If traces are caused by wh-movement, they can be interpreted either as definite copies or as indefinite copies. These two types differ in interpretive properties: definite copies allow neither pair-list readings nor quantifier scope reconstruction, whereas indefinite copies yield the opposite pattern. Rouveret (2008) further challenges the connection between derivational mechanisms and reconstruction effects, claiming instead that such effects are determined by the internal structure of the resumptive pronoun itself. Taken together, these perspectives support the conclusion that resumptive pronouns are derived differently. In the following section, the analysis will focus on the two widely accepted derivational strategies for resumptive pronouns: base-generation and movement.

Base-Generated

Following the idea of McCloskey (1990), resumptive pronouns are ordinary pronouns bound by a null operator that is directly inserted into the specifier of the highest CP. In this case, the pronoun is linked to the clause-periphery via a binding relation. Furthermore,McCloskey (1985) analyzes the properties of resumptive pronouns in Irish to prove that resumptive pronouns are derived by base-generation. This non-movement analysis is supported by three core properties of resumptive pronouns: their insensitivity to island conditions, the absence of weak crossover effects, and their sensitivity to the highest subject restriction. The following section provides a detailed examination of these properties.

(4) Irish

a. na dánta sin nach bhfuil fhios againn cén áit
the poems DEM COMP$_p$*ro*+NEG is knowledge at-us what place
ar cumadh **iad**
COMP were-composed them
'those poems that we do not know where were composed'

b. $*$ na dánta sin nach bhfuil fhios againn cén áit
the poems DEM COMP$_t$+NEG is knowledge at-us what place

ar cumadh
COMP were-composed
'those poems that we do not know where were composed' (McCloskey, 1985)

(5) Irish

a. an fear a raibh mé ag caint leis **pro**
the man COMP_{pro} was I at talk-PROG with-3SNG-MASC him
'the man that I was talking to him'

b. ∗ an fear a bhí mé ag caint le
the man COMP_{t} was I at talk-PROG to
'the man that I was talking to' (McCloskey, 1985)

Normally, the subjacency constraint and the empty category principle can be traced in structures transformed from movement, and these constraints account for the ungrammaticality observed in (4-b) and (5-b). In contrast, the grammaticality of (4-a) and (5-a), where the resumptive pronouns *iad* 'them' and *pro* 'him' appear, suggests that these pronouns serve to circumvent such violations. Chung and McCloskey (1987) assumes that Subjacency and the empty category principle are able to block the application of Wh-movement. Thus, the only possible way to explain the formation of resumptive pronouns *iad* 'them' and *pro* 'him' is that they are base-generated instead of movement. These constraints are understood as manifestations of island effects and weak crossover phenomena. In this case, the acceptability of (4-a) and (5-a) proves that resumptive pronouns are not subject to island conditions or weak crossover effects. These properties have been discussed in earlier works such as J. R. Ross (1967) suggests that pronouns can be separated from their binders by strong-island boundaries, and Borer (1984) and Sells (1984) make the assumption that resumptive pronouns do not raise weak crossover effects in relative clauses. A third diagnostic supporting the base-generation analysis is the sensitivity of resumptive structures to the highest subject restriction, which will be examined in the following part.

(6) Irish

∗ an fear a raibh **sé** breoite
the man C was he ill
'the man that was ill' (McCloskey, 1985)

The example in (6) illustrates the highest subject restriction. The resumptive pronoun *sé* 'he' appears in the subject position, which triggers the violation. This restriction is associated with the application of Principle B, which governs the coreference relation between a pronoun and its antecedent. Borer (1984) concludes this phenomenon as the counterpart in the domain of $\overline{A}$-relations of Principle B for A-relations. It means that a pronoun is not allowed to be locally A-bound or locally $\overline{A}$-bound. However, this kind of highest subject restriction applies specifically to Wh-clause. In contrast, resumptive

pronouns are not subject to positional constraints in either finite or non-finite embedded clauses. This contrast is exemplified by the comparison between (6) and the following example in (7).

(7) a. an t-ór seo ar chreid corr-dhuine go raibh **sé** ann
the gold this COMP$_{pro}$ believed a.few.people COMP was it there
'this gold that a few people believed (it) was there'

b. cúpla muirear a bhféadfaí a rá go rabhadar pro
a-few families COMP$_{pro}$ one-could to say-INF COMP be-PAST-3PL they
bocht
poor
'a few families that one could say (they) were poor. (McCloskey, 1985)

In this case, McCloskey (1985) concludes that resumptive pronouns can exist in all types of Wh-constructions, and they can exist in every clausal position except those ruled out by the highest subject restriction. To be specific, resumptive pronouns are treated as syntactic variables, with their closest binder being a c-commanding element in an $\overline{A}$-position. If it is on the right track, then resumptive pronouns should exhibit the properties associated with variables.

(8) $*$ Who$_i$ did you think that he$_i$ said that Mary would marry t$_i$?

The unacceptability of (8) is caused by a violation of Principle C in binding theory. The object trace *t* is coindexed with the resumptive pronoun *he*, which is in an argument position and also in the domain of the operator *who* that binds *t*. This configuration violates Principle C, which stipulates that referential expressions and variables must be A-freethat is, they must not be c-commanded by a coindexed element in an argument position. This observation further supports the idea that resumptive pronouns come from the base-generation. The other formation of resumptive pronouns is movement, which will be analyzed in the following section.

Movement

According to the analysis presented above, the derivation of resumptive structures in Irish, according to McCloskey (1985), does not involve movement. However, Rouveret (2011) challenges this purely base-generation account by arguing that resumptive pronouns also display certain properties typically associated with movement. The presence of strong crossover effects, sensitivity to island constraints, and the ability to license parasitic gaps are properties of resumptive pronounsthat lend support to the movement hypothesis.

(9) Irish

a. Sin an fear ar dhúirt mé le tuismitheoirí an bhastaird
that the man COMP$_{pro}$ said I with parents the bastard
gur cheart **é** a chaitheamh isteach i bpríosún.
COMP+COP right him to throw into in prison
'That is the man that I said to the bastard's parents that he should be thrown into prison'

b. ∗ Sin an fear ar dhúirt an bastard go maródh **sé** muid
that the man C said the bastard that would-kill he us
'That is the man$_i$ that the bastard$_i$ said he$_i$ would kill us.' (McCloskey, 1990)

The presence of a strong crossover effect is a reliable diagnostic for identifying movement-derived structures. As seen in the examples cited in (9), the presence of resumptive pronouns can be tracked in both of them (*é* 'him' in (9-a) and *sé* 'he' in (9-b)). While (9-a) is grammatical, (9-b) is clearly unacceptable. This comparison invites further investigation into the role of strong crossover effects in resumptive constructions. The ungrammaticality of (9-b) provides evidence that such effects can indeed manifest in resumptive contexts. To be assumed, two examples in (9) are derived differently, where (9-a) is derived from non-movement and (9-b) is from movement. McCloskey (1990) observes that strong crossover effects in resumptive structures emerge specifically when the element that is crossed over is an epithet, rather than a pronominal form. Crucially, when the epithet c-commands the resumptive pronoun, a strong crossover violation arises. In (9-a), the epithet *fear* 'man' does not c-command the resumptive pronoun *é* 'him'. While, in (9-b), the epithet *fear* 'man' c-commands the resumptive pronoun *sé* 'he'. This contrast underscores a key distinction between types of resumptive pronouns: those that are $\overline{A}$-bound may be interpreted as syntactic variables and are likely base-generated, while those not in $\overline{A}$-bound positions are more plausibly derived via movement.

The earlier discussion on island insensitivity also remains a contested aspect of resumptive constructions. Tallerman (1983), drawing on Welsh data, argues that the relation between a resumptive pronoun and a relative complementizer cannot be built across strong island boundaries.

(10) Welsh

a. ? ∗ Dymar dyn y cusanaist ti r ddynes a siaradodd
here-is-the man that kissed you the woman REL talked
amdan **o**
about-[AGR] him
'Here is the man that you kissed the woman who talked about him'

b. ? ∗ Dymar dyn y cusanaist ti r ddynes a brynodd **ei**
here-is-the man that kissed you the woman REL bought [his]
d
house
'Here is the man that you kissed the woman who bought his house.'

c. ? ∗ Dymar dyn y cusanaist ti r ddynes y gwn y cyfar**fu** —hi
here-is-the man that kissed you the woman that I-know that met-[agr] —her
'Here is the man that you kissed the woman that I know that he met her.'

The examples illustrated in (10) indicate that the resumption *o* 'him', *ei* 'his', and *fu* 'he' fail to remedy strong island violations. Consequently, both the presence of strong crossover effects and sensitivity to island constraints offer compelling evidence for a movement-based analysis of certain resumptive pronouns.

Moreover, Engdahl (1983) argues that the licensing of parasitic gaps is a property associated with traces left by $\overline{A}$-movement, which serves as a diagnostic for identifying dependencies of the Wh-movement type.

(11) a. Which articles did John file **t** without reading **p**?
b. ∗ John filed a bunch of articles without reading **p**?

In (11), *t* refers to the movement trace, and *p* represents the parasitic gap. The difference between (11-a) and (11-b) lies in the absence of movement in (11-b). To be specific, the most plausible antecedent for the parasitic gap *p* is the base-generated pronoun *articles* in (11-b), rather than a $\overline{A}$-moved element in (11-a). This difference accounts for the ungrammaticality of (11-b). With respect to resumptive pronouns, Sells (1984) suggests that resumptives are capable of licensing parasitic gaps.

(12) Swedish

de fångar$_i$ som ingen av de läkare som undersökt **p**$_i$ kunde avgöra om
the prisoners that none of the doctors that examined p could decide if
de$_i$ simulerade
they were-simulating
'the prisoners that none of the doctors that examined could decide if they were pretending' (Sells, 1984)

As shown in (12), the parasitic gaps *p* can be tracked . In this case, it is highly possible that the resumptive pronoun *de* 'they' is derived by movement.

Following the non-movement hypothesis of resumptive pronouns illustrated in the previous section, this section has examined properties associated with movement to support the alternative view that resumptive pronouns may also arise through movement. In conclusion, resumptive pronouns can be derived through either movement or non-movement processes. Having explored the formation of resumptive pronouns, the next section turns to their behavior in Mandarin Chinese relativization, offering further insights into the unification of resumptive phenomena and deepening the analysis of relative clause structures.

5.3 The Propoerties of Resumptive Pronouns in Mandarin Chinese Relative Clauses

In Chapter 3, the properties of resumptive pronouns in Mandarin relative clauses have already been discussed. Here, a quick review of this part is necessary. Seen their properties summarized in the following (13):

(13) a. In the cases without islands, the resumptive pronouns and gaps can be free alternatives
b. The optional resumptive pronouns depends on the verbs and subjects within the relative clauses
c. In the preposition stranding case, the resumptive pronouns are obligatory but they can not save the sentence from the violation

Based on the properties list in (13), this section will provide a further analysis of resumptive pronouns in Mandarin Chinese relative clauses.

5.3.1 Personal Pronouns as Resumptive Pronouns

Before delving into the specific analysis of resumptive pronouns in Mandarin Chinese relative clauses, it is essential to confirm that resumptive pronouns are typically personal pronouns which serve to maintain referential continuity in relative clauses. Pronouns in Mandarin Chinese do not display systematic morphological change, which suggests that the same morphological form of a pronoun can be used as a subject, object or prepositional object. The following (14) and (15) summarize the usage of personal pronouns in Mandarin Chinese.

(14) Singular personal pronouns
a. First person: *wo* 'I, me'
b. Second person: *ni* 'you'
c. Third person: *ta* 'he,him/she,her/it'

(15) Plural personal pronouns
a. First person: *women* 'we, us'
b. Second person: *nimen* 'you'
c. Third person: *tamen* 'they,them'

As shown in (14) and (15), the suffix *-men* clearly functions as a plural marker for personal pronouns in Mandarin Chinese. However, (14-c) and (15-c) demonstrate that Mandarin Chinese lacks gender markings and uses graphic forms to make the distinction. With this in mind, the following parts will focus on specifying properties of resumptive pronouns in

Mandarin Chinese relative clauses.

5.3.2 Base-generated or Movement?

Following the idea that resumptive pronouns can be derived either from base-generation and movement, this part set to analyze the formation of Mandarin Chinese resumptive pronouns in relative clauses.

As mentioned in (13-a), Mandarin Chinese relative constructions allow resumptive pronouns and gaps to be free alternatives in cases without islands. In cases involving islands, resumptive pronouns behave like gaps, reflecting their sensitivity to island constraints. Seen in the examples cited in (16).

(16) a. ∗ zhe shi [$_{RC1}$ wo jiandao-guo [$_{RC2}$ tanlun-guo ta$_i$ de] na-ge
this be 1Sg meet-ASP talk-ASP 3MSg DE that-Cl
nvtongxue de] zuojia$_i$
female.student DE writer
Int: 'this is the writer [whom I met the student [who talked about (him)]]'

b. ∗ [[$_{NP}$[Mali qin-le ta$_i$ de] xiaoxi] chuan-bian-le quan yiyuan de]
Mary kiss-Perf 3MSg C rumor spread-Perf entire hospital DE
na-ge yisheng$_i$
that-Cl doctor
Int: 'the doctor [that [the rumor [that Mary kissed him]] was spread everywhere in the hospital]'

c. ∗ [[yinwei Mali qin-le ta$_i$] zheng-ge xuexiao de nanlaoshi dou
because Mary kiss-Perf 3MSg entire-Cl school DE male.teacher all
hen yumen de] na-ge yisheng$_i$
very unhappy DE that-Cl doctor
Int:'the doctor [that all of the male teachers of the school are very unhappy [because Mary kissed him]]'

d. ∗ [[Wang yisheng zai nali$_i$ du boshi] shi zheng-ge yiyuan de qita
Wang doctor at there study PhD make entire-Cl hospital DE other
yisheng dou hen jidu] de na-ge guojia$_i$
doctors all very jealous DE that-Cl country
Int:'the country [in which [[that Doctor Wang had his PhD there] makes the rest of the doctors in the entire hospital very jealous]]' (Pan, 2016)

(16-a), repeated from (83-a), indicates that resumptive pronouns is sensitive to complex-NP islands like CP islands. The complement clauses of noun island (16-b), as another complex-NP islands, which blocks the extraction of the head noun *yisheng* 'doctor' to an A' position due to the subjacency violation. In this case, the resumptive pronoun *ta* 'him' is also ungrammatical. (16-c) and (16-d) reflect the resumptive pronouns *ta* 'him' and *nali*

'there' [3] are also sensitive to adjunct clause islands and sentential subject islands. Based on these evidence, it can be assumed that resumptive pronouns in Mandarin Chinese are derived from movement.

The crossover effects is also a diagnostic way of distinguishing movement and base-generation. It constrains the movement of a wh-constituent cross a pronoun that bears the same index.

In Mandarin Chinese relative clauses with resumptive pronouns, the weak crossover effect seems to be tracked in the relatives with gaps but not in those with resumptive pronouns. Seen the following examples in (17).

(17) a. $*$ ta$_i$-ziji de laopo sha-si-le $\__i$ de na-ge lvshi$_i$
himself DE wife kill-dead-Perf DE that-Cl lawyer
Int:'the lawyer$_i$ that his$_i$ own wife killed t$_i$'

b. ta$_i$-ziji de laopo ba ta$_i$ gei sha-si-le de na-ge ren$_i$
himself DE wife BA 3MSg GEI kill-dead-Perf DE that-Cl person
'the man that his own wife killed him' ='the man who was killed by his own wife'

In (17-a), the relative clause is problematic due to the effect of weak crossover. However, this violation disappears in the presence of resumptive pronouns like that in (17-b). Following McCloskey (1990, 2006), there are two plausible ways to establish anaphoric dependencies in (17-b). In (17-b), a resumptive chain can be built between [*the man*$_i$*...his*$_i$*...him*$_i$]. One possible way is to assume *him* to be the resumptive pronoun, which depends on the antecedent DP *the man*, while *his* is an ordinary pronoun that is anaphorically related to the antecedent *the man*. Since the dependency built between *the man* and *him* crosses over the pronoun *his*, which bears the same index *i*, the weak crossover effect would be expected. Alternatively, if *his* functions as the resumptive pronoun dependent on the antecedent DP *the man*, and *him* is treated as an ordinary pronoun anaphorically related to the resumptive pronoun *his*. Thus, there are two dependencies: [*the man*$_i$*...his*$_i$] and [his$_i$...him$_i$], which do not overlap and that is why (17-b) is grammatical. If the element crossed over is an epithet instead of a pronoun, the crossover effects would be observed. In Mandarin Chinese, the epithets can function as resumptives. Pan (2016) suggests that the expression [pro-D-NP] is available in Mandarin Chinese and can be analyzed as a form of resumptive epithet. In [pro-D-NP], there is an agreement of φ-features between the pro and the NP, and since the pro is a morphologically full pronoun, it can be used independently.

[3]The demonstrative pronoun like *zhe* 'this' and *na* 'that' cannot serve as resumptive pronouns in Mandarin Chinese relative clauses. *nali* 'there' is a locative demonstrative. It refers to alocation, making it behave like a locative pronoun rather than a typical demonstrative.

(18) a. ta-na-xiaozi
3MSg-that-guy
'(he$_i$) that guy$_i$'

b. ta-na-guniang
3FSg-that-girl
'(she$_i$) that girl$_i$'

(18) illustrates the construction of [pro-D-NP]. In (18-a), the pro *ta* 'he' bears the feature [Masculine] which agrees with the NP *xiaozi* 'guy'. Moreover, the pro or D can normally be omitted in this expression. See the following (19):

(19) a. ta-(na)-xiaozi zui hui shuo huang
3MSg-(that)-guy most can tell lie
'(him$_i$) that guy$_i$ is good at telling lies.'

b. (ta)-na-xiaozi zui hui shuo huang
(3MSg)-that-guy most can tell lie
'(him$_i$) that guy$_i$ is good at telling lies.'

The existence of [pro-D-NP] expression in relative clauses triggers the weak crossover effect, as demonstrated in (20).

(20) $*$ na-ge hundan$_i$-ziji de laopo ba ta$_i$ gei sha-si-le de na-ge
that-Cl bastard-self DE wife BA 3MSg GEI kill-dead-Perf DE that-Cl
ren$_i$
person
Int:' that man$_i$ that the bastard$_i$'s own wife killed him$_i$'

(20) is transformed from (17-b), where the pronoun *his* in [*the man$_i$...his$_i$...him$_i$*] is replaced by the epithet expression *na-ge hundan* 'that bastard'. It forms the new resumption chain in (20) that is [*the man$_i$...that bastard$_i$...him$_i$*]. In this case, the anaphoric dependency can only be built between *the man* and *him*, which requires crossing the epithet *the bastard* with the same index. This configuration clearly triggers the crossover effect, rendering (20) ungrammatical. A possible assumption is that Mandarin Chinese relative clauses with resumptive pronouns exhibit the crossover effect only when the crossed element is an epithet. In Mandarin Chinese, the presonal pronouns are often ambiguous between referential and bound interpretations, which makes the weak crossover effects harder to detect. However, epithets, which resist coreference unless bound, make crossover violations more salient. Based on this, the crossover effects does exist in relative clauses involving resumptive pronouns, which supports the view that these resumptive pronouns are derived via movement. Furthermore, the fact that resumptive pronouns in Mandarin Chinese relative constructions are able to license parasitic gaps, as illustrated in (21), provides additional evidence for the movement-based analysis of resumptive pronouns.

(21) yige ni jian-guo $\mathbf{p}_i$ zhihou yongyuan bu hui wangji ta_i de $nanren_i$
one.Cl you see-ASP after forever not will forget 3MSg DE man
'a man who you will never forget after seeing'

(21) indicates that the resumptive pronoun *ta* 'he' serves to license the parastic gap *p*, providing a link between *p* and its antecedent *nanren* 'man', which makes the sentence grammatical.

Following the discussion above, the resumptive pronouns in Mandarin Chinese relative clauses appear to be the result of movement, rather than base-generation. This is supported by the fact that they exhibit typical A'-movment properties, such as the sentivity of islands, the crossover effects and the license of parastic gaps. Based on it, the following part will focus on specifying the types of resumptive pronouns.

5.3.3 Real (Grammatical) or Intrusive?

According to the classification of resumptive pronouns in relativization, intrusive resumptive pronouns are obligatory to prevent a sentence from eventually violating locality constraints, while real (grammatical) ones do not perform this function.

As suggested in (13-a) and (13-c), resumptive pronouns in Mandarin Chinese relative clauses are optional in the cases without islands, while are obligatory in the cases with prepositions. Based on the previous analysis, the optional use of resumptive pronouns fails to save sentences from potential violations. The obligatory use of resumptive pronouns in Mandarin Chinese relative clauses shares the same case, which just serving as a strategy to remedy cases where preposition stranding is blocked. It means they are meaningless to be inserted when sentences violates the locality constraints, as shown in (22).

(22) $*$ zhe jiu shi $[_{RC1}$ wo mai-le $[_{RC2}$ **ba** $\mathbf{ta}_i$ da-sui-le de] na-ge
this exactly be 1Sg scold-Perf BA 3OSg break-Perf DE that-Cl
nanhair de] na-ge $huaping_i$
boy DE that-Cl vase
'this is exactly the vase [that I scolded the boy [who broke it]].'

In (22), *ba* is a preposition [4], marking the direct object *na-ge huaping* 'that vase' which undergoes relativization. Since *ba* cannot be stranded on the relativized site, the resumptive pronoun *ta* is obligatory here. The head noun *na-ge huaping* 'that vase' is not allowed to be extracted from the CP island (RC_2) due to the Subjacency. Clearly, the presence of the resumptive pronoun *ta* does not resolve this sentence violation. In this case, the agreed point is that there is no intrusive resumptive pronouns in Mandarin Chinese relative clauses (Aoun et al., 2001; Pan, 2016). However, it does not mean that intrusive use

[4] *ba* in Mandarin Chinese syntax are commonly described as a grammatical particle or disposal marjer. It has a prepositional function in the ba-construction by indicating the object being manipulated or acted upon by the verb. Here, *ba* is in such the ba-construction.

of resumptive pronouns is entirely absent in Mandarin Chinese; evidence of such usage can be found in other A' dependences, such as dislocation structures. Seen in the example cited in (23).

(23) na-ge yisheng$_i$, [yinwei Mali qin-le *(ta$_i$)] zheng-ge xuexiao de
that-Cl doctor because Mary kiss-Perf 3MSg entire-Cl school DE
nanlaoshi dou hen yumen
male.teachers all very unhappy
'As for that doctor, all of the male teachers of the school are very unhappy [because Mary kissed him].'

The dislocation structure shown in (23) is adapted from the relative structure in (16-c). The presence of the resumptive pronoun *ta* in (23) prevents a violation of the adjunct clause island *yinwei Maili qin-le* 'because Mary kissed', where the head noun *yisheng* 'doctor' cannot be extracted. However, the resumptive pronoun *ta* in the relative clause (16-c) does not serve this function.

The above analysis makes a distinction between the usage of resumptive pronouns in Mandarin Chinese relative clauses and dislocation structures. The further analysis will focus on the internal structure of Mandarin Chinese resumptive pronouns to find out why their intrusive usage depends on the types of constructions. Freidin and Vergnaud (2001) suggest that personal pronouns are definite descriptions. Pan (2016) and Rouveret (2008) extend this definite-description anlaysis into resumptive pronouns, proposing that resumptive pronouns have two forms which are the reduced form [D, φ] and the extended form [[D, φ] NP]. In Mandarin Chinese, the reconstruction effects in relative clauses and dislocation structures with resumptive pronouns provide strong evidence for this two-form hypothesis. If this hypothesis is on the right track, it offers a potential explanation for the real and intrusive uses of resumptive pronouns in Mandarin Chinese. The scope of a universal quantifier, a quantified NP, an anaphoric binding and condition C effects are four reliable tests for reconstruction effects. The following parts will apply these into the analysis of resumptive pronouns.

(24) The relative clause

[mei-ge xuesheng dou hui jiang ta$_i$ du hao-ji-bian de] yi-pian
each-Cl student all will JIANG 3OSg read several.times DE one-Cl
wenzhang$_i$
paper
'a paper$_i$ that each student will read it$_i$ several times' ($\forall > \exists$)

(25) The dislocation structure

$*$ ziji$_i$-de wenzhang$_j$, mei-ge xuesheng$_i$ dou hui ba ta$_j$ na qu
self-DE paper each-Cl student all will BA 3OSg take to

can-sai
participate.to.competition
'the paper$_j$ of his$_i$ own, every student$_i$ will take it$_j$ to participate to a competition'

(24) and (25) illustrates the cases from relative clauses and dislocation structures, respectively, both containing universal quantified expressions. In (24) the universal quantified phrase *mei-ge xuesheng* 'each student' scopes over the existential quantified phrase *yi-pian wenzhang* 'a paper'. It implies that *yi-pian wenzheng* 'a paper' can be reconstructed on the relativized site, which is occupied by the resumptive pronoun *ta* 'it'. Since the indefinite *yi-pian wenzheng* 'a paper' can be viewed as a part of the NP, it is plausible to treat the resumptive pronoun *ta* 'it' in (24) as having an extended form, as shown in (26).

(26) *ta* 'it' = [$_{DP}$ D φ (3^{rd}, Sg., inanimate)[$_{NP}$ a paper]]→ [$_{DP}$[each$_i$($\forall$)] student]...[$_{DP}$ D φ [$_{NP}$ a$_i$ ($\exists$) a paper]]

(26) assumes the indefinite *yi-pian wenzheng* 'a paper' to be reconstructed inside the NP. It alllows the existential quantified expression *yi-pian wenzheng* 'a paper' located in the direct object position to fall under the scope of the universal quantified phrase *mei-ge xuesheng* 'each student' in the subject position. However, the unacceptability observed in the dislocation structure (25) indicates that *ziji-de wenzhang* 'the paper of his own' cannot be bound by the universal quantified expression *mei-ge xuesheng* 'each student'. In this case, the resumptive pronoun *ta* 'it' is a reduced form which left no place for the reconstruction of the NP, as shown in (27).

(27) *ta* 'it' = [$_{DP}$ D φ (3^{rd}, Sg., inanimate)]→ $*$[$_{DP}$[each$_i$($\forall$)] student]...[$_{DP}$ D φ]

In (27), the lack of NP within the resumptive pronoun *ta* 'it' leads to a vacuous quantification for the universal quantifier *mei-ge* 'each'. The primary hypothesis can be made here is that the resumptive pronouns in Mandarin Chinese appear in two distinct forms: an extended form, as seen in relative clauses, and a reduced form, as seen in dislocation structures. Following this hypothesis, further comparisons will be drawn between these two forms through cases involving quantificational antecedents, anaphoric binding and condition C effects, as seen in the following (28) (29) (30)respectively.

(28) Quantificational antecedents

a. [Zhangsan yiwei [xuexiao hui zhunxu [ta$_i$ bu-yong bu-kao de]]]
Zhangsan think school will permit 3MSg no.need make.up.exam DE.C
mei-ge bujige de xuesheng$_i$ jieguo dou liuji le (relative clause)
every-Cl failed DE student finally all stay.grade SFP
'Every student$_i$ [who$_i$ failed the exam [that Zhangsan thought that school

would permit [that he$_i$ is exempted from the make up exam]]] will finally not go up to the next year.'

b. ∗ mei-ge bujige de xuesheng$_i$, Zhangsan hai tianzhen-de yiwei xuexiao
every-Cl failed DE student Zhangsan still naively think school
hui zhunxu ta$_i$ bu-yong bu-kao (dislocation structure)
will permit 3MSg no.need make.up.exam
'As for every student$_i$ who failed the exam, Zhangsan still thought naively that the school will permit that he is exempted from the make up exam.'

(29) The anaphoric binding

a. [Zhangsan$_i$ zuotian wanshang ba ta$_j$ gei da-sui-le de] ta$_i$-ziji
Zhangsan yesterday evening BA 3OSg GEI break-Perf DE.C 3MSg-self
de na-ge baobei huaping$_j$ (relative clause)
DE that-Cl treasured vase
'his$_i$ own treasured vase$_j$ that Zhangsan$_i$ broke it$_j$ last night'

b. ∗ ta$_i$-ziji de huaping$_j$, Zhangsan$_i$ zuotian wanshang ba ta$_j$ gei
3MSg-self DE vase Zhangsan yesterday evening BA 3OSg GEI
da-sui-le (dislocation structure)
break-Perf
'As for his$_i$ own vase$_j$, Zhangsan$_i$ broke it$_j$ last night.'

(30) The Condition C effects

a. ∗[wo juede [ta$_i$ keyi ba ta$_j$ fabiao zai guojia yi-ji qikan-shang
1Sg think 3FSg can BA 3OSg publish at national first-rate
de]] Yiqin$_i$ de lunwen$_j$ (relative clause)
journal-on DE.C Yiqin DE article
'Yiqin$_i$'s article$_2$ [that I think[that she$_i$ can publish it$_j$ in first-rate national journals]].'

b. Yiqin$_i$ de lunwen$_j$, wo juede ta$_i$ keyi ba ta$_j$ fabiao zai guojia
Yiqin DE article 1Sg think 3FSg can BA 3OSg publish at national
yi-ji qikan-shang (dislocation structure)
first.rate journal-on
'As for Yiqin$_i$'s article$_j$, I think that she$_i$ can publish it$_j$ in first-rate national journals.'

Similar to the patterns observed in (24) and (25), the resumptive pronoun *ta* 'he' in (28-a) appears in its extended form [[D, φ] NP]. The presence of NP in *ta* 'he' allows the quantificational antecedent *mei-ge bujige de xuesheng* 'every student that failed the exam' to bind the resumptive pronoun *ta* 'he' as a variable. In contrast, the ungrammaticality of (28-b) is due to the lack of NP in its reduced resumptive pronoun *ta* 'he'. In (29-a), the anaphoric binding is possible not only between the resumptive pronoun *ta* 'it' and the antecedent NP *ta-ziji de baobei huaping* 'his own treasured vase', but also between the pronoun within the antecedent *ta-ziji* 'his own' and the proper name *Zhangsan*. The way

to receive it is to reconstruct the antecedent NP on the relativized site occupied by the resumptive pronoun. Therefore, it is plausible to assume the resumptive pronoun *ta* 'it' to be the extended form, as illustrated in (31-a). Conversely, the unacceptability of (29-b) indicates that the resumptive pronoun *ta* in the dislocation structure in the dislocation structure is in its reduced form, lacking the internal NP necessary for reconstruction, as shown in (31-b).

(31) a. *ta* 'it' = [$_{DP}$ D φ (3^{rd}, Sg., inanimate)[$_{NP}$ his own treasured vase]]→ [$_{TP}$ Zhangsan$_i$...[$_{DP}$ D φ (3^{rd}, Sg., inanimate) [$_{NP}$ his$_i$ own treasured vase$_i$]]

b. *ta* 'it' = [$_{DP}$ D φ (3^{rd}, Sg., inanimate)]→ *[$_{TP}$ Zhangsan$_i$...[$_{DP}$ D φ (3^{rd}, Sg., inanimate)]]

Example (30) illustrates the effects of Condition C. In (30-a), if assuming the NP *Yiqin de lunwen* 'Yiyin's article' is reconstructed on the position occupied by the resumptive pronoun *ta* 'it', then the NP containing the proper name *Yiqin* would be directly bound by the subject pronoun *ta* 'she', which shares the same index. This configuration results in the violation of Condition C effects, as proper names cannot be bound by coindexed pronouns in their c-command domain. The presence of this violation suggests that the resumptive pronoun *ta* 'it' is in its extended form, allowing for reconstruction. In contrast, no Condition C violation arises in (30-b), which indicates that the resumptive pronoun in this dislocation structure is likely to be the reduced form, thereby blocking reconstruction of the NP and avoiding a binding violation. This contrast is further illustrated in (32).

(32) a. *ta* 'it' = [$_{DP}$ D φ (3^{rd}, Sg., inanimate)[$_{NP}$ Yiqin's article]]
Condition C effects:
*[$_{TP}$ she$_i$ can publish [$_{DP}$ [D φ][$_{NP}$ Yiqin$_i$'s article]]

b. *ta* 'it' = [$_{DP}$ D φ (3^{rd}, Sg., inanimate)]
Absence of Condition C effects:
[$_{TP}$ she$_i$ can publish [$_{DP}$ [D φ]]

In conclusion, Mandarin Chinese relative clauses do not allow the intrusive usage of resumptive pronouns. However, such intrusive resumptive pronouns are attested in other A' dependencies like dislocation structures. The reconstruction effects detected in resumptive pronouns indicate that they have two distinct internal forms: an extended form [[D, φ] NP] and a reduced form [D, φ] depending on the syntactic constructions in which they appear. The presence of an NP in the extended form allows the extended form to function as a variable bound by a universal quantifier, and it also gives rise to reconstruction effects such as anaphoric binding and Condition C effects. Based on these observations, the hypothesis can be made that the extended form of resumptive pronouns derived via movement, as evidenced by the reconstruction effects it exhibits, whereas the reduced

form is the result of base-generation. If this is on the right track, it is plausible to attribute the different behaviors of resumptive pronouns in Mandarin Chinese to these two structural types. Intrusive resumptive pronouns are generally assumed to be the result of base-generation. However, all resumptive pronouns in Mandarin Chinese relative clauses are derived via the head noun movement, which rules out the possibility of intrusive usgae in this construction. With this distinction in mind, the following part will examine the distribution of resumptive pronouns in Mandarin Chinese relative clauses, focusing on their interaction with head nouns.

5.4 'Weak' Resumptive Pronouns in Mandarin Chinese

The preceding section outlines basic analyses of resumptive pronouns in Mandarin Chinese relative clauses. In Mandarin Chinese relative clauses, resumptive pronouns appear in their extended form [[D, φ] NP] and are all derived through movement. As a strategy for relativization, resumptive pronouns exhibit a dependency of their corresponding head nouns. By analyzing this correlation, this section identifies these pronouns in Mandarin Chinese relative clauses as a distinct type of 'weak' resumptive pronoun.

5.4.1 Definiteness Constraints on Head Nouns

In Mandarin Chinese relative clauses, the presence of resumptive pronouns imposes restrictions on their head nouns, which are required to be definite. The examples cited in (33) illustrate this constraint.

(33) a. zhe jiu shi [Zhangsan xihuang le ta$_i$ henjiu de] na-ge nvhai$_i$
this exactly be Zhangsan like ASP 3FSg long DE that-Cl girl
This is the girl who Zhangsan has admired for long time.

b. ?? zhe jiu shi [Zhangsan xihuang le ta$_i$ henjiu de] nvhai$_i$
this exactly be Zhangsan like ASP 3FSg long DE girl
Int:This is the girl who Zhangsan has admired for long time.

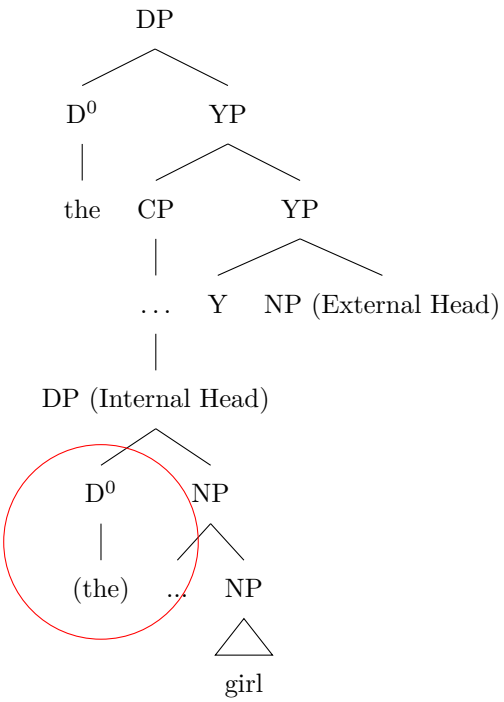
c. [mei-ge daoyan dou hui jiang ta$_i$ kan haojibian] de yi-ge
each-Cl director all will JIANG 3OSg watch several.times DE one-Cl
dianying$_i$
movie
An movie that each director will watch it several times

It is important to note that Mandarin Chinese is a topic-prominent language, where nominal expressions in subject positions are typically interpreted as definite. In the absence of definite or indefinite articles like *the* or *a* in English, definiteness in Mandarin is often marked by demonstratives such as *zhe* this' and *na* 'that', or quantifiers like *mei* 'every'

[5]. In (33-a), the head noun *nvhai* 'girl' appears in the object position, and the demonstrative *na* 'that' ensures a definite interpretation of the relativized head. If omitting this demonstrative, the violation will be raised as shown in (33-b). In (33-c), the relativized head *dianying* 'movie' appears in the subject position, where the topic-prominent structure of Mandarin Chinese provides an inherent definiteness, even without an overt demonstrative.

The examples shown in Mandarin Chinese relative clauses above raises a critical issue: if resumptive pronouns co-occur with definite head nouns, this implies the presence of two D elements within a single relative clause, potentially resulting in a syntactic crash. This violation becomes apparent when considered in light of the *double-Headed structure* and the *multi-dominance* theory, as illustrated in (34) below.

(34)



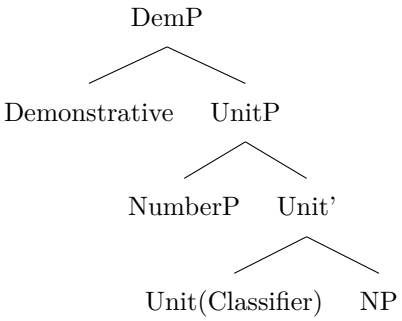
According to this combined approach, the internal head (dP_2) is a DP consists of a D^0 and an NP, while the external head (dP_1) is a NP which is identical to the NP within the internal head. Resumptive pronouns are the products of partial deletion under the matching case. As such, the elements contained in the red circle can be composed into a resumptive pronoun after the deletion of the NP (the external head). Notably, if both head nouns and resumptive pronouns include D elements, they would compete for the same D^0 position. The following parts will examine nominal expressions in Mandarin Chinese, with the aim of evaluating the plausibility of the co-occurence between resumptive pronouns and definite head nouns within relative clauses.

[5]More specific analysis about the expression of definiteness will be shown in the following section part.

5.4.2 Nominal Expressions in Mandarin Chinese

Resumptive pronouns and head nouns in Mandarin Chinese relative clauses are both the nominal expressions. Before analyzing the D-elements within them, it is essential to examine the nominal structure of Mandarin Chinese. This structure was previously outlined in (6), Chapter 3 and is restated here in (35) for ease of reference.

(35)



The lack of definite and indefinite articles in Mandarin Chinese hardens the analysis of definiteness and indefiniteness expression in Mandarin Chinese. Mandarin Chinese, as a topic-prominent language, where any forms in subject positions or topic positions can receive a definite interpretation. C. J. Huang et al. (2018) argues that D is typically considered the locus of reference and definiteness, it is expected to host all expressions associated with these features such as demonstratives, pronouns, proper names and even definite bare nouns. This section builds on the basic number expression [number+classifier+ NP] and explores potential candidates for the D position, with the aim of clarifying the status of dual D elements in Mandarin Chinese relative clauses containing resumptive pronouns.

The Form [number+classifier+ NP]

In general, number expressions [number+classifier+ NP] are considered non-definite, as they are typically disallowed in subject or topic positions. These positions are required to be definite in topic-pronminent languages, seen the related examples in the following (36) and (37).

(36) a. ?? san-ge xuesheng wan-le shouji
three-Cl student play-ASP phone
'Three students played the phone.'

b. ∗ san-ge xuesheng, wo yiwei wan-le shouji
three-Cl student I think play-ASP phone
'Three students, I thought played the phone.'

(37) a. xuesheng/Xiaoming/ta wan-le shouji
student/Xiaoming/3Msg play-ASP phone
'The students/Xiaoming/He played the phone.'

b. xuesheng/Xiaoming/ta, wo yiwei wan-le shouji
student/Xiaoming/3Msg I think play-ASP phone

'The students/Xiaoming/He, I thought played the phone.'

In (36), the number expression [number+classifier+noun] *san-ge xuesheng* 'three students' are avoided in both the subject position (36-a) and topic position (36-b). In contrast, the bare noun *xuesheng* 'student', proper name *Xiaoming* and pronoun *ta* 'he' are acceptable in these same syntactic positions. These examples suggest number expressions are generally regarded as non-definite, whereas bare nouns, proper names and pronouns are compatible with definite interpretations. However, Y.-h. A. Li (1998) argues that Mandarin Chinese distinguishes between two types of number expressions: quantity-denoting and individual-denoting. This distinction is exemplified in (38).

(38) a. ni ruguo neng zhaodao liang-ge bangshou$_i$, jiu gankuai ba tamen$_i$
you if can find two-Cl helper then hurry BA them
qing lai
invite come
'If you can find two helpers, hurry and invite them over.'

b. $*$ liang-ge chengren$_i$ bu ru tamen$_i$ de san-ge xiaohao you
two-Cl adult not compare they DE three-Cl children have
liliang
strength
'Two adults are not as strong as their three children.' (C. J. Huang et al., 2018)

In (38-b), the number expression *liang-ge chengren* 'two adults' is a quantity expression which does not co-refer with the bind pronoun *tamen* 'they'. However, this binding relation is available in (38-a) since the number expression *liang-ge bangshou* 'two helpers' is interpreted as denoting individuals rather than quantities. Moreover, quantity and individual expressions behave differently in the scope interaction, seen in (39).

(39) a. liang-ge ren, wo zhidao chi-de-wan liang-kuai niupai.
two-Cl people I know eat-can-finish two-Cl steak
'Two people, I know can finish two pieces of steak.'

b. wo rang liang-ge ren chi liang-kuai niupai.
I let two-Cl people eat two-Cl steak
'I let two people eat two pieces of steak.'

In (39-a), the only available reading is that the amount of steak consumed by the amount of two people. This reading suggests that quantity-denoting number expressions are unable to participate in scope interactions with other quantificational elements. By contrast, *liang-ge ren* 'two people' can scope over *liang-kuai niupai* 'two pieces of steak', yielding a reading in which a total of four pieces of steak are consumed in (39-b). Evidence from binding and scope cases indicates the same form [number+classifier+noun] shares two distinct underlying structures, as illustrated in (40).

(40) a. [$_{NumP}$ liang ge ren]
two Cl person
'two people'

b. [$_{DP}$ D [$_{NumP}$ liang ge ren]]
two Cl person
'two people'

(40-a) represents the quantity-denoting expression, while (40-b) illustrates the individual-denoting counterpart, in which determiner is projected even though it is not filled by a lexical item. The distinction between (40-a) and (40-b) support for the existence of a DP category in Mandarin Chinese. To develop a clearer understanding of this category, the following analysis other elements that bear D features, such as demonstratives, pronouns, proper names.

D-Elements in Demonstratives, Pronouns, Proper Names

Demonstratives, pronouns, and proper names are commonly assumed to occupy D positions. This section aims to investigate the presence of D-elements in these categories by examining the underlying structure of nominal expressions in Mandarin Chinese.

The structure [demonstrative+number+classifier+noun] provides evidence that the demonstrative is likely to occupy a kind of D position, its related hypothesis has been established in Chapter 2. (41) offers a recapitulation of this structure.

(41) a. zhe/na liang-ge ren
these/those two-Cl person
'these/those two people'

b. zhe/na-ge ren
this/that-Cl person
'this/that person'

(41-a) illustrates the full structure [demonstrative+number+classifier+noun], whereas (41-b) represents a reduced form in which the demonstrative is followed by the classifier directly, with the numberal omitted.

Regarding pronouns, Longobardi (1994) argues that pronouns can be analyzed as the spell-out features of D. Moreover, Cardinaletti, Starke, et al. (1999) argues that certain classes of pronouns exhibit syntactic and distributional properties akin to determiners, supporting that pronouns may occupy the D position. The distributional patterns of pronouns in Mandarin Chinese further support this D-head hypothesis, which is illustrated in (42).

(42) a. wo xihuan [ta yi-ge (ren)]
I like 3MSg one-Cl person
'I like him (one person)'

b. wo xihuan [ta-men liang-ge (ren)]
I like 3SG-Pl two-Cl person
'I like them (two people)'

c. wo xihuan [ta-men haizi]
I like 3SG-Pl children
'I like their children'

Example (42-a) and (42-b) exemplify the structure [pronoun+number+classifier+noun], where the suffix *-men* in (42-b) adds pural meaning to the pronoun *ta* 'he/she'. (42-c) shows the another possible pattern that is [pronoun+noun]. Caponigro (2000) and Longobardi (2008) propose that nominal expressions function as arguments only if introduced by a D^0 category. As shown in (42), nominal expressions with pronouns in Mandarin Chinese are permissible in argument positions, thereby supporting the presence of D elements within pronouns.

Proper names, which denote uniquely identifiable entities, perform a referential function comparable to that of pronouns (S.-Z. Huang, 2006), thereby strongly supporting the view that they are interpreted as definite expressions. However, in contrast to demonstratives and pronouns, proper names in Mandarin Chinese do not readily combine with number expressions. This distributional constraint is exemplified in (43).

(43) a. Xiaoming zhe-ge ren, wo yiwei henduo ren dou xihuan
Xiaoming this-Cl person I think many person all like
'Xiaoming this person, I thought many people like (him).'

b. wo xihuan Xiaoming, Xiaowang na ji-ge haizi
I like Xiaoming Xiaowang those several-Cl children
'I like Xiaoming, Xiaowang those several children.'

c. wo xihuan Xiaoming, Xiaowang ta-men ji-ge haizi
I like Xiaoming Xiaowang 3SG-Pl several-Cl children
'I like Xiaoming, Xiaowang them several children.'

d. wo xihuan Xiaoming ta-men (na) san-ge
I like Xiaoming 3SG-Pl those three-Cl
'I like Xiaoming them (those) three.'

The examples in (43) illustrate four distributional patterns involving proper names, which are summarized in (44).

(44) a. [proper name+demonstrative+classifier+noun] (as in (43-a))

b. [proper name+demonstrative+number+classifier+noun] (as in (43-b))

c. [proper name+number+classifier+noun] (as in (43-c))

d. [proper name+ pronoun+demonstrative+number+classifier] (as in (43-d))

These patterns indicate that, in Mandarin Chinese, proper names must be followed by a demonstrative or a pronoun before they can combine with number expressions. Assuming

that proper names, demonstratives, and pronouns each instantiate D-related features, this raises a structural question regarding how multiple D-elements may co-occur within a single nominal expression, despite the standard assumption of a unique D position. The following section investigates this issue by analyzing the syntactic positions and hierarchical interactions of these D-related elements within the nominal expression in Mandarin Chinese.

Positions for Demonstratives, Pronouns, Proper Names

In the previous section, the co-occurence of demonstratives, pronouns and proper names within nominal expressions raises the issue of potential conflict at the D position. Accordingly, this section aims to account for the structural plausibility of such co-occurrence in Mandarin Chinese.

The fixed word order form [proper name+pronoun+demonstrative] can be observed in Mandarin Chinese. C. J. Huang et al. (2018) argues that plural expressions in Mandarin Chinese provide crucial evidence for identifying the underlying structure of such forms. Due to the lack of inflectional morphology, the suffix *-men* serves as a plural marker for pronouns or human nouns. As to demonstratives, they have their own plural marker *-xie* or be followed by a number+classifier to indicate plurality. These plural marking strategies are exemplified in (45).

(45) a. ta na-ge haizi
3MSg that-Cl child
'him (that child)'

b. ta-men na-xie haizi
3SG-Pl that-Pl children
'them (those children)'

c. ta-men zhe san-ge haizi
3SG-Pl these three-Cl children
'them these three children'

Example (45-a) illustrates a singular nominal expression. In (45-b) both the pronoun *ta* '3SG' and the demonstrative *na* 'that' are independently marked for plurality by the suffixes *-men* and *-xie*, respectively. (45-c) illustrates an alternative strategy for expressing the plurality of demonstratives, wherein the demonstrative follows the plural pronoun *ta-men* 'them'. In contrast to demonstratives and pronouns, proper names exhibit their structural properties within plural nominal expressions, as illustrated in (46), (47) and (48).

(46) a. ∗ Xiaoming-men zhe/na san-ge haizi
Xiaoming-Pl these/those three-Cl children
Int:'these/those three children including Xiaoming'

b. ∗ Xiaoming-men ta-men san-ge
Xiaoming-Pl 3SG-Pl three-Cl
Int:'they three, including Xiaoming'

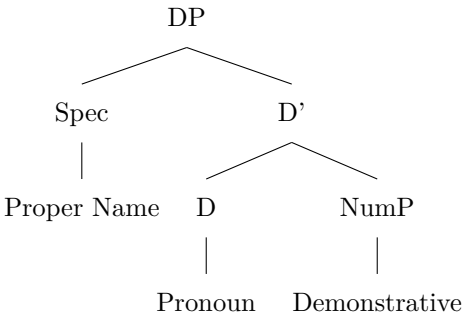
(47) a. (Xiaoming) ta-men na-xie haizi
Xiaoming 3SG-Pl that-Pl children
'(Xiaoming) them those children'

b. ∗ (Xiaoming) ta na-xie haizi
Xiaoming 3MSg that-Pl children
'Xiaoming him those children'

(48) Xiaoming ta-men haizi
Xiaoming 3SG-Pl children
'Xiaoming them children'

The ungrammaticality of examples in (46) indicates that the plural suffix *-men* cannot attach to proper name in the presence of pronouns or demonstratives. The comparison shown in (47) proves that pronouns must be in plural forms when followed by plural demonstratives regrardless of whether or not proper names occur. The plausibility of (48) proves that the number agreement is obligatory within all the elements except for the cases where proper names and pronouns co-occur. Therefore, C. J. Huang et al. (2018) proposes that the fixed order [Proper Name + Pronoun + Demonstrative] in Mandarin Chinese nominal expressions corresponds to the underlying structure in (49), where the demonstrative occupies the D head, the pronoun is adjoined to D, and the proper name is base-generated in Spec,DP:

(49)



This structural analysis accounts for the distribution of the plural suffix *-men* within nominal expressions involving demonstratives and pronouns. When both a demonstrative and a plural feature are present, the feature is hosted at the D head and is morphologically realized on the pronoun adjoined to D. Since demonstratives in Mandarin Chinese do not inflect for plurality via *-men*, the pronoun serves as the morphological exponent of plurality within the DP. In contrast, the proper name, occupying Spec,DP, lies outside the projection of D and thus cannot bear the plural marker in the presence of either a pronoun or a demonstrative. Moreover, this structural configuration predicts the strict adjacency observed among proper names, pronouns, and demonstratives. That is, no intervening elements are permitted between these constituents, as illustrated in (50).

(50) a. Xiaoming ta na-ge haizi
Xiaoming 3SG that-Cl child
'Xiaoming that child'

b. ∗ Xiaoming hen gaoxing de ta na-ge haizi
Xiaoming very happy DE 3SG that-Cl child
Int:'Xiaoming that happy child'

c. ∗ Xiaoming ta hen gaoxing de na-ge haizi
Xiaoming 3SG very happy DE that-Cl child
Int:'Xiaoming that happy child'

As illustrated in (50-b) and (50-c), the insertion of the adjectival modifier *hen gaoxing de* very happy results in ungrammaticality. Thus, the proposed structure in (49) provides a principled account for both the co-occurrence of proper names, pronouns, and demonstratives, as well as the distributional constraints governing their ordering and adjacency within the DP. With this in mind, the following section revisits the definiteness constraints imposed on head nouns in Mandarin Chinese relative clauses containing resumptive pronouns.

5.4.3 On the Hypothesis of 'Weak' Resumptive Pronouns

Based on the previous analysis, it can be hypothesized that all resumptive pronouns in Mandarin Chinese relative clauses take the extended form [[D, φ] NP], which can be regarded as the result of head noun movement. The following part analyze the properties of resumptive pronouns in Mandarin Chinese, with the aim of explaining the definiteness constraints set on head nouns.

In Mandarin Chinese, resumptive pronouns are typically bare pronouns lacking inflectional morphology,the identification of the pronouns referent relies heavily on discourse cues rather than on grammatical marking. Unlike languages such as Arabic or Hebrew, which possess definite articles, case morphology, and agreement features, Mandarin Chinese lacks these mechanisms. The related examples are cited in (51).

(51) a. rajul-un alla ra'ayt-u-(h) (Arabic)
man-NOM.INDEF REL.M.SG see-1SG.PFV-3MSG.ACC
'the man who I saw'.

b. ish she-ra'iti (oto) (Hebrew)
man REL-see-1SG.PFV 3MSG.ACC
'the man who I saw'

According to the above examples, the optional use of reusmptive pronouns can be observed in Arabic and Hebrew relative clauses, which favor for the indefinte head nouns. [6] In (51-a), the indefinite head *rajul-un* 'a man' is clearly linked to the resumptive pronoun

[6]In spoken and informal varieties of Arabic and Hebrew, resumptive pronouns frequently co-occur with definite head nouns in relative clauses. This is exemplified in the following data:

-h 'him' with the help of the relative marker *alla* and agreement morphology. Similarly, in Hebrew (51-b), *oto* 'him' is a resumptive pronoun clearly linked to it via the relative marker *she-* and overt case marking on the pronoun. Thus, the definite head noun requirement in Mandarin Chinese can be viewed as a compensatory strategy for the language's lack of case marking, agreement morphology, and articles, all of which in other languages help track reference even when the head noun is indefinite. Therefore, it is proposed that the bare pronouns found in Mandarin Chinese relative clauses, lacking overt morphological features such as case and gender, can be analyzed as a type of 'weak' resumptive pronoun. In such configurations, the presence of a definite head noun is obligatory in order to prevent ambiguity in the co-reference relationship between the head noun and the resumptive element. Moreover, when this analysis is situated within the underlying Mandarin Chinese DP structure proposed in (49), the potential competition for the D position between the definite head noun and the resumptive pronoun is avoided, as the structure allows for both elements to co-occur without syntactic conflict.

5.5 Conclusion

In this chapter, resumptive pronouns in relativization have been analyzed specifically. Firstly, two main types of resumptive pronouns are clarified: real (grammatical) and intrusive resumptive pronouns. This division depends on their ability to repair island violations. Intrusive resumptive pronouns can serve as the last resort to save sentences, while real (grammatical) ones cannot. Then, I have analyzed the formation of resumptive pronouns. Evidence such as insensitivity to island constraints, the absence of weak crossover effects, and sensitivity to the highest subject restriction, all observed in certain resumptive constructions, supports a base-generation analysis. However, patterns of strong crossover effects, sensitivity to islands, and the licensing of parasitic gaps in other contexts lend support to a movement-based analysis. In this case, it can be assumed that resumptive pronouns can be formed by either base-generation or movement.

(52) Arabic

al-rajul alladh ra'ayt-u-h
DEF-man REL.3MSG see-1SG.PFV-3MSG
'the man whom I saw'

(53) Hebrew

ha-ish she-ra'iti oto
DEF-man REL-see-1SG.PFV 3MSG.OBJ
'the man whom I saw'

These constructions demonstrate that, despite the presence of a resumptive pronoun within the relative clause, the head noun remains definite. This pattern supports the argument that the morphological richness, especially in features like person, gender, and number marking on the resumptive helps disambiguate coreference, thus mitigating potential ambiguity. Consequently, the presence of resumptive pronouns does not necessarily impose strict constraints on the definiteness of head nouns in these languages.

After the general illustration of resumptive pronouns, I focus on their behavior in Mandarin Chinese relative clauses. Their properties can be summarized as follows: (a) no intrusive resumptive pronouns in relative constructions but can be observed in dislocation structions; (b) two forms of resmptive pronouns which are the reduced form [D, φ] and the extended form [[D, φ] NP]. In relative constructions, only the extended form can be observed since resumptive pronouns in Mandarin Chinese is a result of head noun movement.

Based on these crucial facts about resumptive pronouns in Mandarin Chinese relative construction, I further investigate the correlation between resumptive pronouns and head nouns, establishing that resumptive pronouns can only co-occur with definite head nouns in relativization. By combining Cinque (2020)s *double-Headed structure* with the *multi-dominance* theory, the composition of the internal head (dP_2) is clarified as comprising both an NP and a D^0. The NP component is shared with the external head (dP_1), while the D^0 provides the structural position for the resumptive pronoun. The frequent co-occurrence of resumptive pronouns and definite head nouns in Mandarin Chinese raises the issue of potential D-category conflicts within nominal expressions, as both elements possess D-features. To address this, I examine the structure of Mandarin Chinese nominal expressions and demonstrate that elements such as proper names, pronouns, and demonstratives, all carrying D features, can co-occur without conflict. The final section of the chapter introduces the hypothesis that resumptive pronouns in Mandarin Chinese relative clauses represent 'weak' pronouns. Due to the lack of case marking, agreement morphology, and articles in Mandarin Chinese, these resumptive pronouns behave as bare pronouns, thereby fitting the profile of 'weak' resumptives as proposed in this study. Such 'weak' resumptive pronouns rely heavily on the presence of definite head nouns to establish clear co-reference.

Actually, resumptive pronouns can be distributed widely in $\overline{A}$-dependencies, which is a vast research topic and needs further consideration. This chapter focuses on their distribution in one type of $\overline{A}$-dependencies—relative constructions, with the aim of making some contributions to the broader generalization of the resumption.

Chapter 6

Conclusion

In this thesis, I have compared various analyzing approaches to relative clauses. The advantage of Cinque's *double-Headed structure* is obvious considering the fact that relative clauses can be derived from either movement or non-movement. The *double-Headed structure* is actually a kind of mixed analysis approach, which makes the unification of all possible derivation approaches.

Based on the *double-Headed structure*, Cinque (2020) suggests that Mandarin Chinese relative clauses are a form of non-finite/participial relative clauses. However, several features distinguish Mandarin Chinese relative clauses from typical non-finite/participial relatives: the presence of overt subjects, the invariant relativizer *de*, the absence of participial forms, the presence of tense and aspect markers, and their unboundedness and sensitivity to island constraints. Much of the confusion surrounding Mandarin Chinese relative clauses stems from the fixed relative element *de*, the pre-nominal syntax typology, the nature of appositive relative clauses, and the strategies used in relativization.

Although Mandarin Chinese is a VO language and would thus be expected to favor post-nominal relative clauses, the language exhibits pre-nominal relative clause structures instead. I adopt the view that the invariant relativizer *de* acts as a special relative complementizer, enabling word order changes during relativization and thereby making pre-nominal positioning plausible in Mandarin Chinese.

Regarding appositive relative clauses, I have summarized two main types: integrated and non-integrated appositives. Nevertheless, Mandarin Chinese relative clauses differ from these two main types. Specifically, Mandarin Chinese appositives restrict both the category of antecedents and the types of illocutionary. Also, antecedents are required to share the same theta-role if they are split. Despite these constraints, pronoun binding and quantifier nominal binding are still observable in the relativization process. In this case, I propose that Mandarin Chinese appositives are distinct from normal integrated ones and more accurately described as fully-integrated appositives.

Regarding relativization strategies, no intrusive resumptive pronouns are available in Mandarin Chinese relative clauses. This indicates that resumptive cannot be used as the

last resort to rescue violations in relativization. This absence can be attributed to the fact that all resumptive pronouns in Mandarin Chinese relative clauses are formed via movement rather than base-generation. Given that resumptive pronouns in Mandarin Chinese are permitted only in the presence of definite head nouns, I propose that these resumptives can be analyzed as 'weak' ones, relying on the definite head to establish clear coreference due to their lack of overt morphological features. The DP structure of Mandarin Chinese accommodates a double-D configuration, whereby both the resumptive pronoun and the definite head noun bear D-category features.

Overall, the central issue addressed in this thesis is the combination of the *double-Headed structure* and *multi-dominance* theory. This unified structural approach provides a compelling framework for the analysis of relative clauses. In the *double-headed* structure, both the internal and external heads are treated as dPs, which raises the question of how to determine the size and internal composition of these heads. The *multi-dominance* theory, which admits relative clauses are multi-rooted, aligns well with the *double-headed* structure. Specifically, it proposes that the two heads differ structurally-one being a NP and the other composed of a D^0 and an NP. This distinction clarifies the derivational mechanisms involved in the *double-headed* structure, such as full matching, partial matching, and raising, and it also offers possible structural positions for resumptive pronouns.

Ultimately, several open questions remain. This thesis has focused on resumptive pronouns within relative constructions, but resumptive pronouns are widely distributed in $\overline{A}$-dependencies and might behave differently even within the same language. For instance, while intrusive resumptive pronouns are not available in Mandarin Chinese relative clauses, they do appear in dislocation constructions. This variation suggests that resumptive pronouns are structurally sensitive and their behavior merits further investigation. Additionally, the concept of 'weak' resumptive pronouns, as defined for Mandarin Chinese, could be extended cross-linguistically to explore whether it represents a broader typological tendency or a language-specific phenomenon.

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