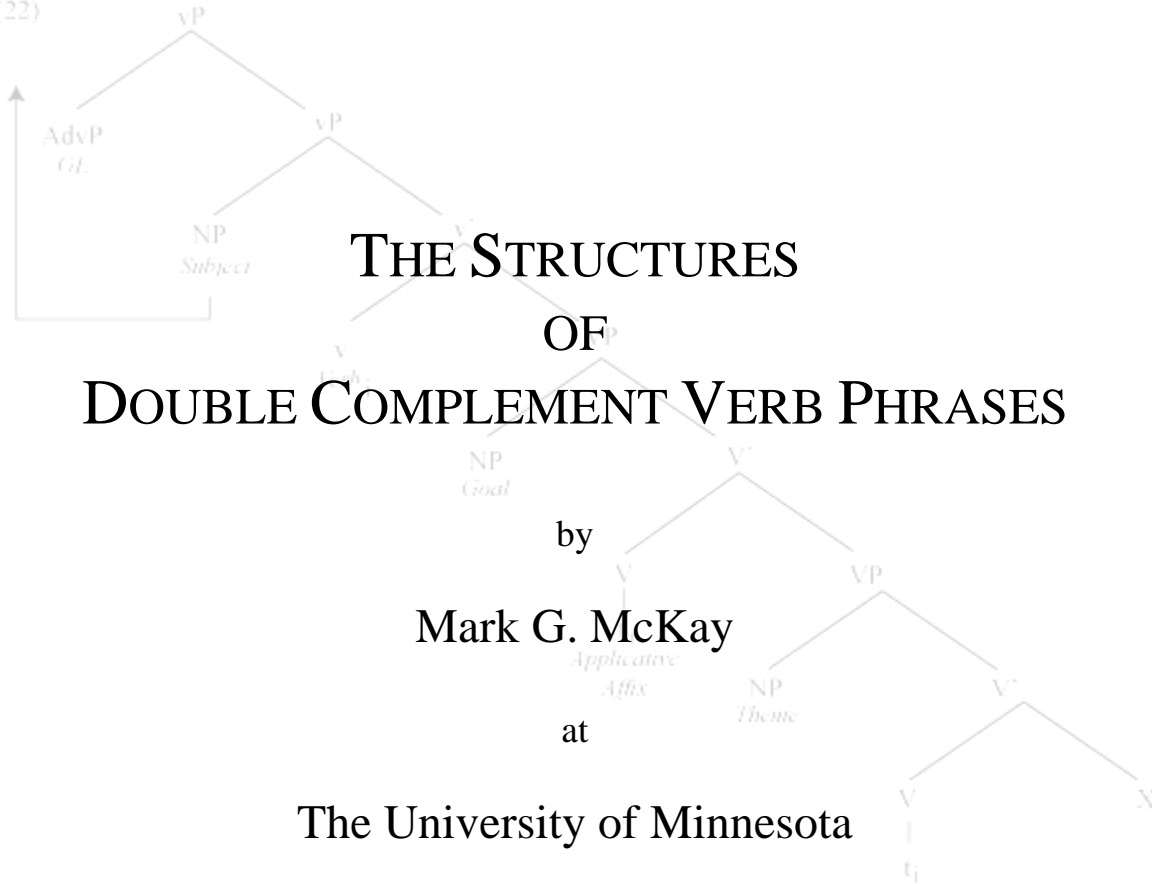


(22)



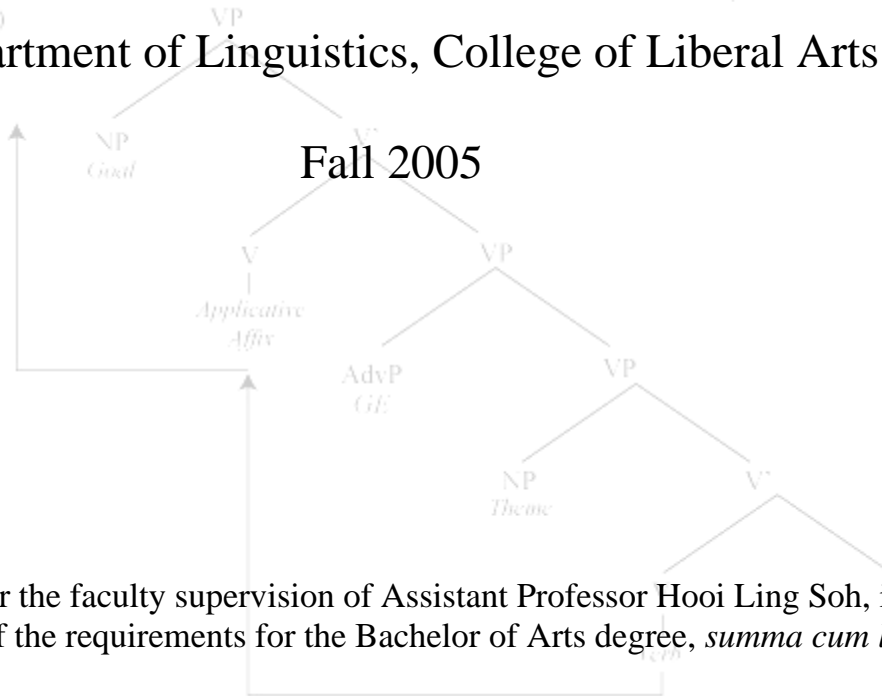
THE STRUCTURES OF DOUBLE COMPLEMENT VERB PHRASES

Mark G. McKay

The University of Minnesota

Department of Linguistics, College of Liberal Arts

(21)



Submitted under the faculty supervision of Assistant Professor Hooi Ling Soh, in partial fulfillment of the requirements for the Bachelor of Arts degree, *summa cum laude*.

The Structures of Double Complement Verb Phrases

Introduction

The structure of a particular type of ditransitive verb phrase (VP) has been the topic of countless debates, discussions, lectures and articles during the past two decades. This class of verb phrase requires two object complements. Best exemplified in English by verbs such as *send* or *give*, these verbs involve the transfer of an entity referred to by a noun phrase (NP) from one party to another. Double complements come in two types, dative and double object. The dative construction is represented by an NP direct object (DO) and an indirect object (IO) embedded within a prepositional phrase (PP) in the order [V NP PP] as in example (1a); the double object construction takes two NP objects in the order [V NP₁ NP₂] as in example (1b).

- 1a. John sent a letter to Mary.
- 1b. John sent Mary a letter.

Several questions arise in comparing these two sentences. Is one form derived from the other as a transformation from D-Structure (DS) to SS? Do they have exactly the same implied meaning? Does the insertion of another lexical item such as an adverb shed light on the issue? These questions are still being explored as no one theory is widely accepted within the linguistics community. The debate on this topic, sometimes heated, has already prompted revisions to the general structure of the verb phrase, and has presented challenges to previously accepted theories and caused many theories to be revisited.

The purpose of this thesis, therefore, is not to present a solution to the problem, but rather to summarize the theoretical history on this topic and to expand on a perspective explored by my advisor, Dr. Hooi Ling Soh, in regard to the behavior of these constructions with the insertion of

the distributive adverb *each*. As such, this essay is divided into two parts: a summary of relevant theory and the application of Dr. Soh's recent proposal to English as original research.

Part I contains two sections which review the theoretical history of double complement constructions. Section One focuses on the structure of the verb phrase, beginning with the observed syntactic asymmetry of double complement constructions as presented initially in Barsi and Lasnik (1986). Building on the issue of asymmetry, Section Two looks at Larson (1988) who posits that the double object construction is derived from the dative construction through what he calls "dative shift," similar to the passive transformation. More importantly, Larson introduces the concept of a VP-shell structure in which the verb raises from a position below its first argument. Section Three presents another perspective by Marantz (1994) in which the author proposes the existence of two distinct D-Structures for dative and double object constructions rather than a transformation from one structure to the other. Marantz proposes a more complex structure for the double object construction. His work is the instrumental in Soh's article and subsequently the original research portion of this thesis.

Part II contains three sections focusing on distributive quantifiers in double complement constructions. Section Four reviews Soh's analysis that *GE* 'each' in Mandarin Chinese provides evidence for distinct DS forms for both the dative and the double object construction in support of Marantz' theory. In Section Five, I apply Soh's proposal to the distributive quantifier *each* in American English. I discuss the details of Soh's proposal and predict the expected results when applying her ideas to English. Section Six summarizes the project and offers an introspection of the process.

Part I – Theoretical History of Double Complement Verb Phrases

1. Asymmetry in the VP-Structure of Double Complement Verbs

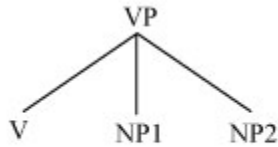
To understand this asymmetry, it is important to first understand the notion of c-command.

X c-commands Y if and only if:

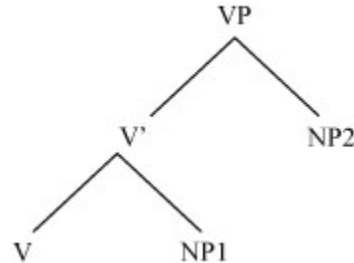
- X does not dominate Y.
- Y does not dominate X.
- The first branching node that dominates X also dominates Y.

Prior to Barss and Lasnik (1986), the arguments of double object constructions were believed to demonstrate a symmetrical relationship as represented in (2a) by Oehrle (1976), and (2b) by Chomsky (1981). The structure in (2a) clearly shows the symmetrical c-command relationship, but (2b) shows that NP₂ c-command-s NP₁, but not the inverse. If the definition is expanded to refer to the first maximal projection (XP) rather than the first branching node, known as m-command, the two NPs m-command each other symmetrically.

(2) a.



b.



Using anaphors, the principles of binding theory, and the scope condition on polarity *any*, Barss and Lasnik present six situations which suggest an asymmetrical relationship between the object arguments of double object sentences. They posit that NP₂ should be in the domain of NP₁ but not the inverse, contrary to the proposed structures above. By the definition of symmetry, simply reversing the order of the arguments should produce grammatical sentences, but (3b) and (4b) suggest otherwise

- 3a. I showed John himself (in the mirror).
- b. *I showed himself John (in the mirror).

- 4a. I showed the professors each other's students.
- b. *I showed each other's students the professors.

In illustrating this asymmetry, Barrs & Lasnik provide evidence that structures in which the arguments symmetrically c-command each other are not adequate, but they fall short of proposing a solution other than to modify the relevant definitions to include a reference to linear precedence. Regardless, their work inspired others to address the issue as the rest of this section will illustrate.

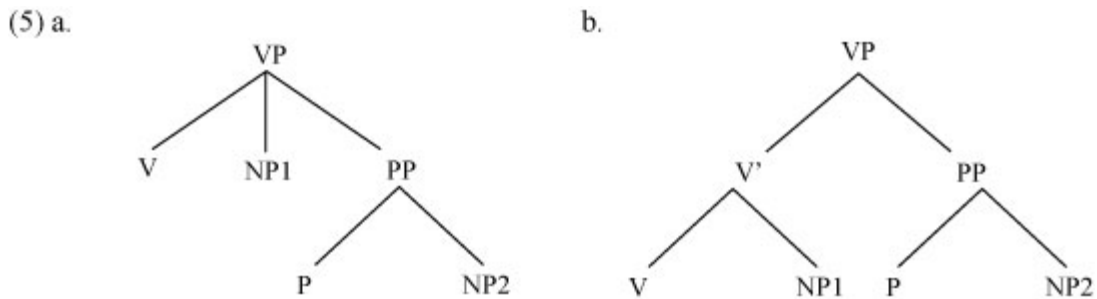
2. The Introduction of the VP-Shell and Dative Shift

The first citation of interest regarding double complement constructions is the seminal work of Larson (1988) where the author recites the conditions in which double object constructions demonstrate asymmetries in their syntactic domain. Larson then shows that dative sentences exhibit the same asymmetries.

- 3a. I showed Mary to himself.
- b. *I showed herself to John.

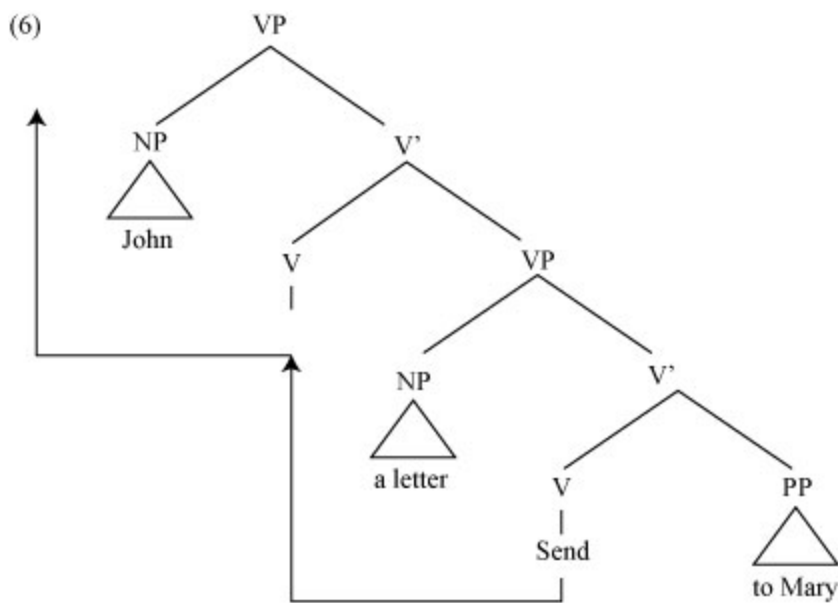
- 4a. I sent each boy to the other's parents.
- b. *I sent the other's check to each boy.

But this is not a problem for the structure of dative constructions because as (5) demonstrates, the corresponding dative structures already exhibit asymmetry.



In (5a), the first node dominating NP₁ is VP, which also dominates NP₂, but the first node dominating NP₂ is PP, which does not dominate NP₁. In (5b), neither NP c-commands the other, though NP₁ m-commands NP₂. In both structures, the PP layer prevents NP₂ from c-commanding NP₁, thus illustrating the expected asymmetry. This fact led Larson to revisit the dative structure and adopt concepts from a proposal by Chomsky (1955/1975) as further developed by Bach (1979), Dowty (1979), and Jacobson (1983; 1987).

Larson proposes a verb phrase structure based on Chomsky’s idea of a “clauselike structure” inside the verb phrase as in (6).



The verb and the indirect object form a constituent or “small predicate” which predicates the direct object acting as an “inner subject” to form a complex structure. This inner subject maintains the desired asymmetry while allowing the basis for Larson to build upon for his proposal. Where Chomsky proposed a derivational relationship from the dative structure to the double object structure through extraposition, Larson takes the inverse approach. He suggests that the dative construction is the underlying form and that the double object construction is derived through transformation as explained below. By embedding one VP inside another, Larson created what is known today as a VP-shell structure. In the case of the dative construction in (6), *a letter* is the “inner subject” predicated by the “small predicate” *give to Mary*. The verb then undergoes internal raising from the head position in the lower VP to the empty head position in the upper VP to assign case to *a letter*.

Larson then cites examples regarding Heavy NP Shift (HNPS) for further evidence of his verb phrase structure, stating HNPS is left movement of a predicate rather than previously analyzed standard of right movement of an NP. The underlying form is shown in (7a) with (7b) representing right movement of an NP, and (7c) representing left movement of the “small predicate.”

- 7a. {I gave everything that demanded to John.}
- b. I gave t_i to John [everything that he demanded] $_i$.
- c. I [gave to John] $_i$ everything that he demanded t_i .

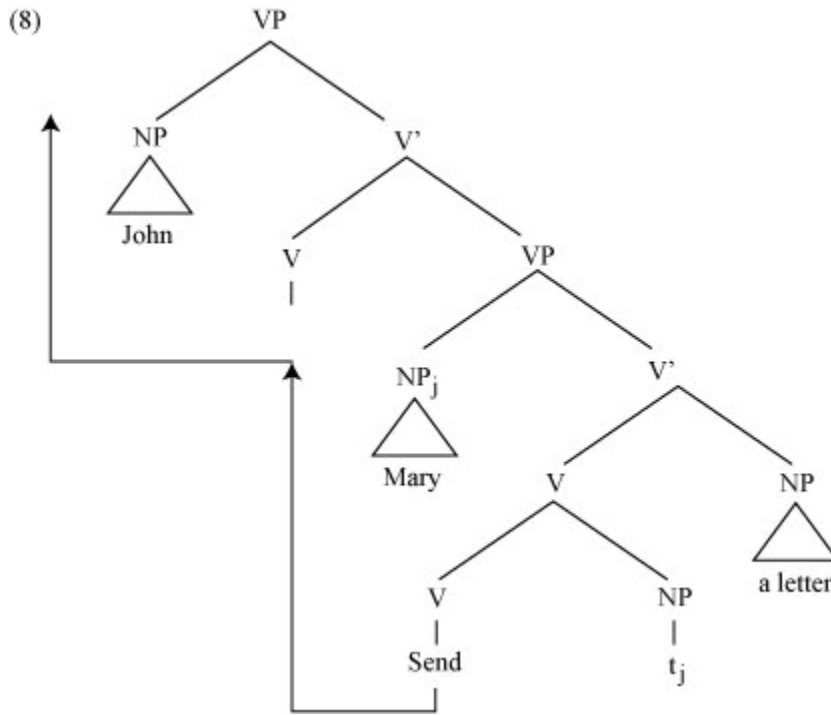
He claims that this phenomenon is motivated by case assignment and rendered through a process he calls V' Reanalysis. Under his definition, V' Reanalysis is optional based on whether there is an unsaturated internal theta role. If there is, the V' constituent is reanalyzed as V and the “small predicate” then raises in what Larson calls “light predicate raising” rather than just the verb itself

raising. His VP-shell structure for the dative construction and V' Reanalysis both yield the expected asymmetry at DS for each of the dative examples and set the scene for his analysis of the transformation of dative to double object constructions.

Citing the Uniformity of Theta Assignment Hypothesis (UTAH) proposed by Baker (1985) which states that "Identical thematic relationships between items are represented by identical structural relationships between those items at the level of D-structure," Larson revisits the derivational relationship between dative and double object constructions. He assumes that the thematic roles assigned in the dative and double object constructions are the same, though some have suggested that the thematic roles assigned are not the same and thus propose two distinct structures at DS, see Pesetsky (1995) and Harley (2000).

Larson then compares the transformation from dative to double object construction, which he calls Dative Shift, to the formation of passive sentences, as illustrated in (9). He proposes that the Case marker *to* is absorbed, similar to how the morpheme *-en* absorbs Case in passive formation. The "inner subject" is then demoted to the adjunct position, though unlike passive formation, this is not an optional process. The indirect object then undergoes NP movement to "inner subject" position as is typical for the subject. Finally, the verb raises to the empty upper V position and assigns case to the indirect object.

With the additional VP layer in (8), the indirect object (*Mary*) now c-commands the direct object (*a letter*), but the first branching node that dominates *a letter* is V' which does not dominate *Mary* and thus *a letter* does not c-command *Mary*.



While Larson’s VP-shell structure has attained widespread acceptance within the linguistic community, his analysis of Dative Shift has come under a great deal of scrutiny. Jackendoff (1990) expands the range of double complement constructions to include several other situations including those which take non-alternating complements in a double object construction (*deny*, *cost*); alternating NP-PP complements (*blame X on Y/blame Y for X*); double PP complements with free order (*talk to X about Y/talk about Y to X*); and double complements in nominals (*a gift from Y to X/a gift to Y from X*). Jackendoff observes that Larson’s analysis does not account for the fact that goal arguments take a broader range in dative constructions than in double object constructions as in (9).

- 9a. Susan sent Harry to Max/down the hall/to his room/away.
- b. Susan sent Max/*down the hall/*to his room/*away Harry

Larson himself even notes that there is a difference in meaning between the dative in (11a) and the “shifted” double object in (11b), with the former carrying a greater implication that the students actually learned French.

- 10a. John taught the students French
- b. John taught French to the students.

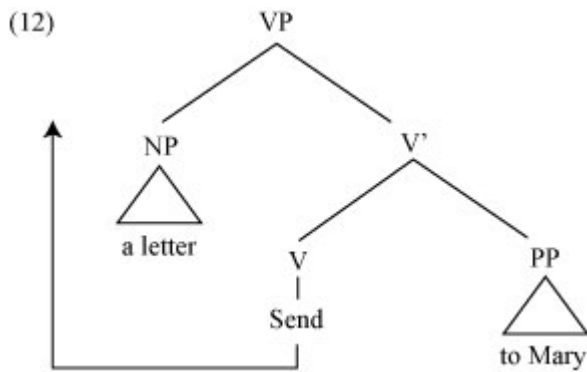
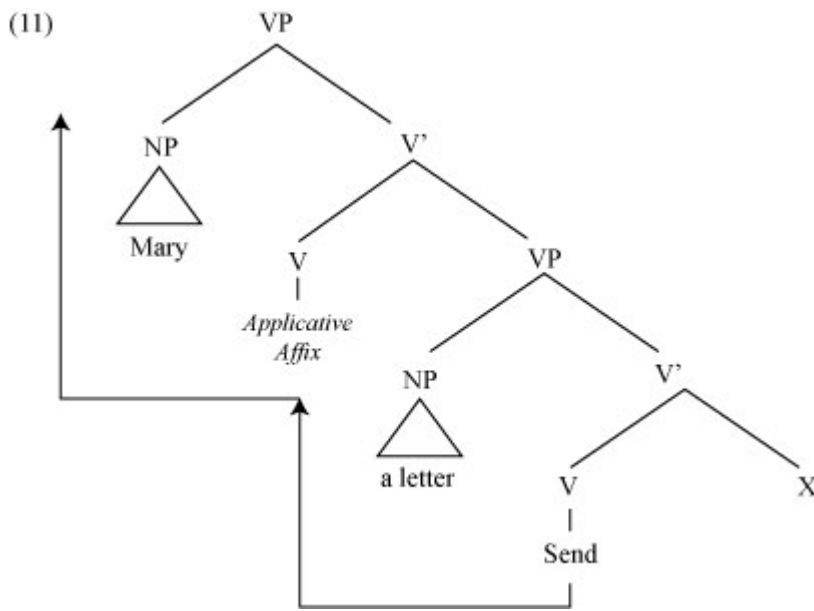
The literature on double complement constructions subsequent to and regarding Larson (1988) is expansive, though for the perspective of this paper, I mention only a few very briefly. Two other important perspectives, that of Marantz (1993) and Soh (1998, 2005) are relevant to the original research in this paper and are thus covered in greater depth in the following sections. For more on asymmetry and alternate constructions see Pesetsky (1995), Harley (2000), Hale and Keyser (2000), and Bruening (2001). For more on Heavy Noun Phrase Shift, see Nissenbaum (2000).

3. Additional VP Layer in the Double Object Construction

The most pertinent proposal following Larson (1988) comes from Marantz (1993) in which the author takes a “deeper consideration” of asymmetry and proposes that syntactic asymmetries provide enough evidence to explain double complements and that thematic hierarchies do not. His work deals a great deal with Bantu languages which exhibit an overt applicative affix to mark the direct object. This affix, analyzed not as a preposition, but as part of the verb, is not present in English and some other languages in the overt phonological sense, but Marantz assumes that double object constructions carry this covertly.

Marantz accepts Larson’s account of “complex predicates,” but rather than suggesting that double object constructions are derived from dative constructions, he proposes that each has a distinct underlying form as illustrated in (11) and (12). Note that he assumes the subject to be

projected into Spec-TP rather than internal to the VP, and that the verb raises further to obtain the proper word order for English. Later a proposal for a light verb phrase, or vP will show another layer to which the subject and verb can raise, but Marantz’s analysis was prior to that.



The crux of the proposal by Marantz is that each “real” object, or NP requires a unique VP as opposed to an oblique object such as PP which can be realized as the complement of verbs. Thus the dative construction in (1a) revisited as (13a) has only one VP layer while the double object

construction in (1b) revisited as (13b) contains two VP layers and the verb raises to assign Case and generate the proper word order required.

- 13a. John sent a letter to Mary.
- b. John sent Mary a letter.

As is the case in Larson's proposal, (11) shows that the upper object c-commands the lower, but not the inverse, and (12) shows that the PP in the dative structure prevents the lower object from c-commanding the upper object, thus displaying the desired asymmetry.

Marantz provides support for this difference with an example from Aoun and Li (1989) with the notion of quantifier scope, as shown in (14).

- 14a. Elmer gave someone every porcupine.
 OK: There's one guy that got all the porcupines.
 OUT: For each porcupine, there's someone that got that porcupine
- b. Elmer gave some porcupine to everyone.
 OK: There's one porcupine that Elmer gave to everyone.
 OK: Every person got at least one porcupine from Elmer.

If a double object construction contains a quantifier in both object positions, the scope of the quantifiers is fixed with the first quantifier having wide scope over the second, but not the inverse. The additional VP layer prevents the lower object from taking scope over the upper object. A dative construction with two quantifiers, however, generates both wide and narrow scope readings. Since both quantifiers reside within the same VP, they can each adjoin to VP and take scope over the other, giving both wide and narrow scope.

Marantz explains four different asymmetries touching on how different theta roles produce different behaviors such as benefactive and instrument NPs, but the underlying structure presented above is universal from his perspective.

Part II – Distributive Quantifiers in Double Complement Verb Phrases

4. The Distributive Quantifier ‘GE’ in Mandarin Chinese

Soh (2005) provides further evidence for a more complex verb phrase structure in the double object construction proposed by Marantz by presenting examples in Mandarin Chinese in which the distribution of the quantifier *GE* contrasts between the dative construction and the double object construction. Building upon the work of Kung (1993) and Lin (1998), Soh provides evidence for the licensing conditions of *GE* to demonstrate this contrast. The basis for her proposal is that *GE* cannot appear between the two internal arguments of a dative construction, but in the double object construction it can, as in (15).

- 15a. Ta song-le nei san-ge ren ge yi-fen liwu
 He give-Perf that three-Cl person GE one-Cl present
 ‘He gave those three people each a present.
- b. *Ta song-le nei san-fen liwu ge gei er-shi-ge ren
 He give-Perf that three-Cl presents GE GEI twenty-Cl person
 ‘He gave those three presents each to twenty people.’

GE is sometimes referred to as a dyadic quantifier which has a pairing requirement between two NPs: a plural NP that c-commands the quantifier, and an indefinite NP that the quantifier c-commands. The terms to define these two NPs are somewhat confusing. Choe (1987) refers to the plural NP as the *Sorting Key* and to the indefinite NP as the *Distributive Share* while Safir and Stowell (1988) call them *Range NP* (R-NP) and *Distributing NP* (D-NP) respectively.

16. Licensing conditions for Distributive Quantifiers

- i) Sorting Key must be plural
- ii) Distributive Share must be indefinite
- iii) Sorting Key must c-command the Distributive Quantifier
- iv) The Distributive Quantifier must c-command the Distributive Share

By definition, the distributive quantifier must c-command the distributive share, thus *GE* cannot appear at the end of the sentence, as in (17) because it does not c-command the NP *yi-ben shu*.

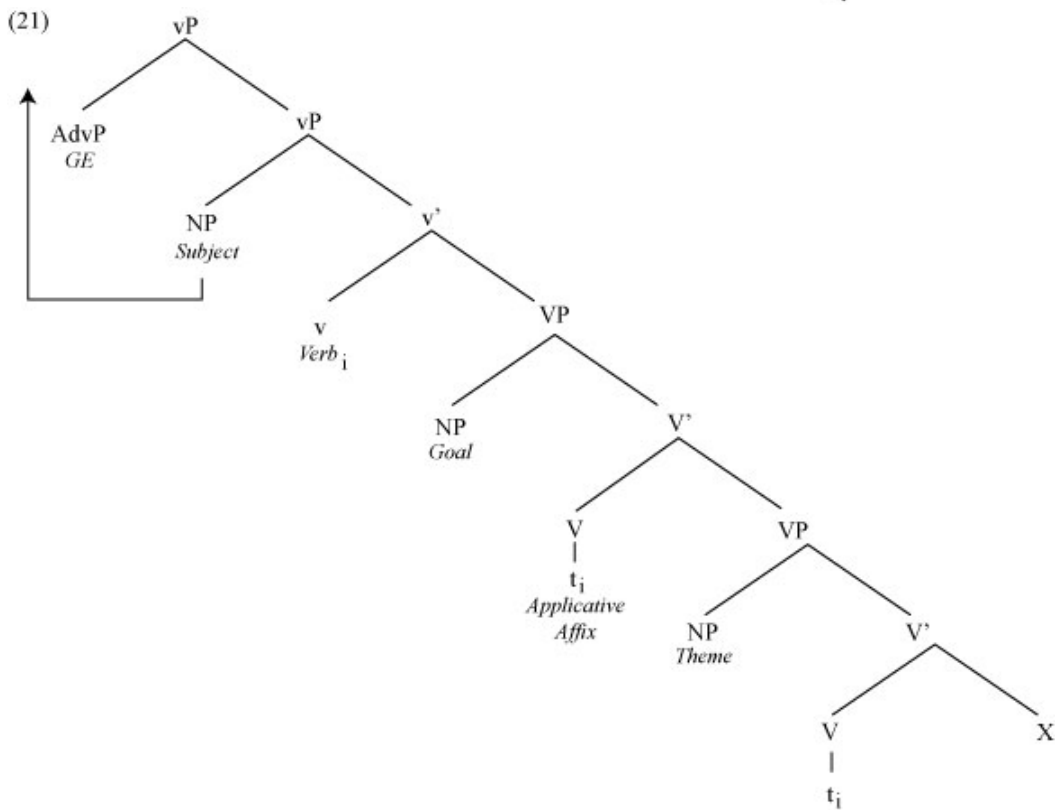
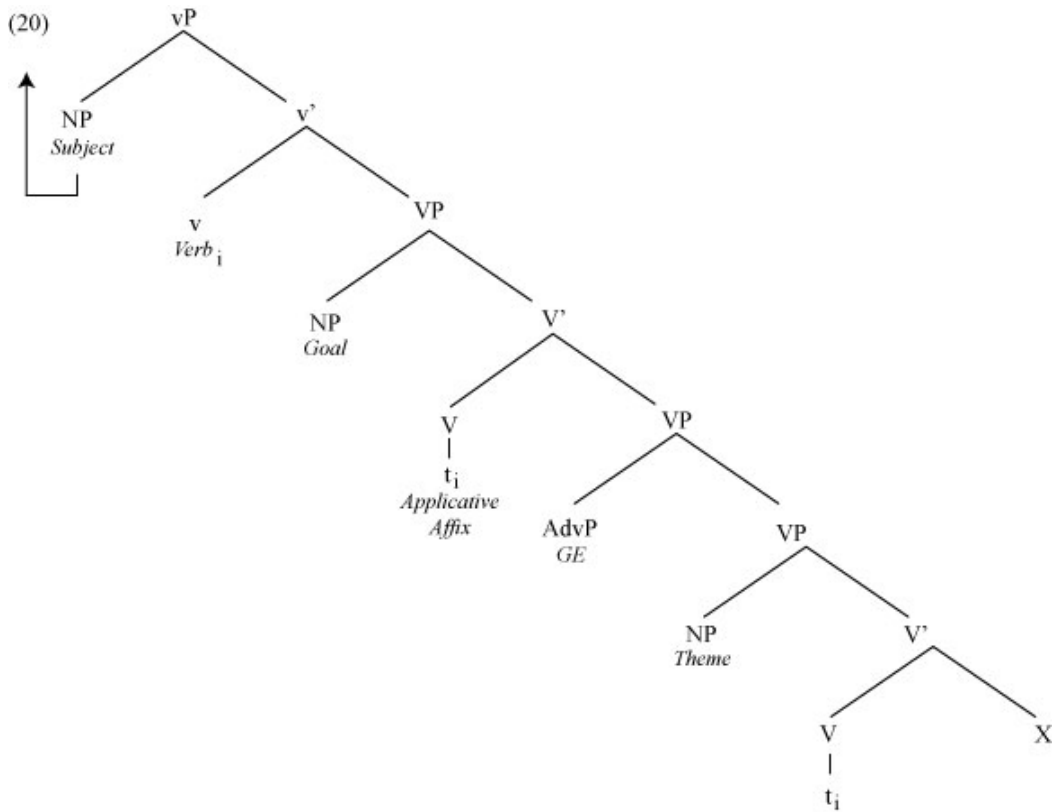
17. *tamen mai-le yi-ben shu ge
they buy-Perf one-CL book GE.

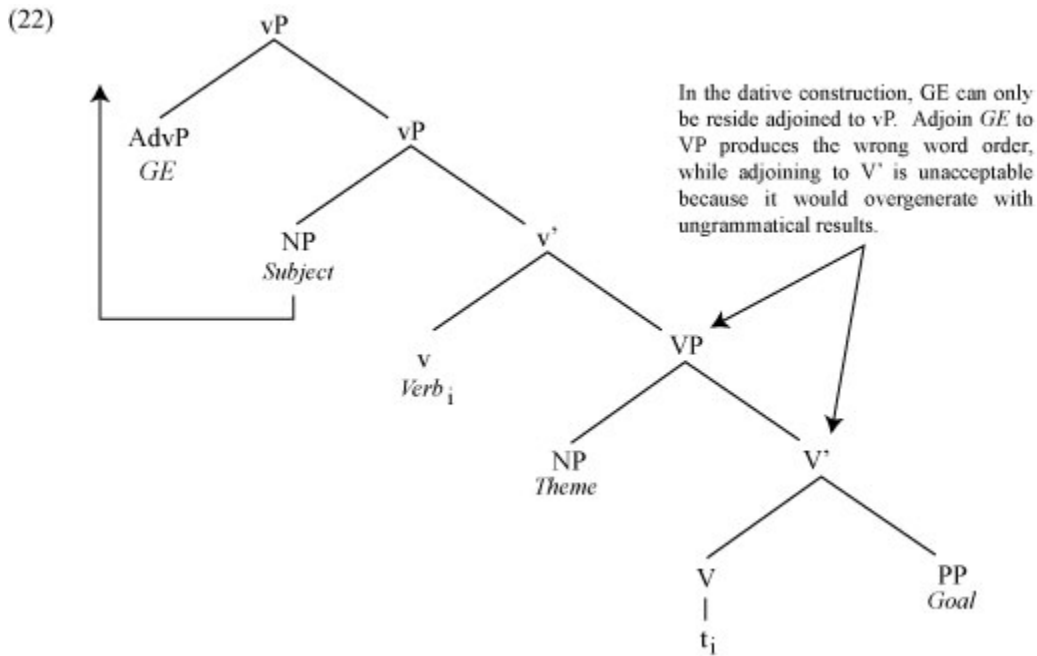
Soh's article also discusses prepositions in Mandarin Chinese and the case of *GEI give/to* following the verb, but this too is outside the purview of this paper. As (15a) has already demonstrated, *GE* can appear between the two inside arguments in double object constructions adjoined to the inner VP. But this poses a slight problem in that if *GE* can adjoin to the inner VP, it should also be able to adjoin to the other VP in both constructions. The locality conditions which constrain this adjunction which can be referenced in Soh (2005).

Soh also shows that *GE* can appear before the verb, but not before modal verbs or sentence adverbs as in (18) and (19) illustrate.

- 18a. Mei-ge xuesheng hui ge jiao yi-pianzuowen gei wo.
Every-Cl student. will GE hand one-Cl composition GEI me
'Each of the students will hand a composition to me.'
- b. *Mei-ge xuesheng ge hui jiao yi-pian zuowen gei wo.
Every-Cl student. GE will hand one-Cl composition GEI me
- 19a. Xiaoli he Xiaowang shang-xingqi ge jiao-le yi-pian zuowen gei wo
Xiaoli and Xiaowang last-week GE hand-Perf one-Cl composition GEI me
'Xiaoli and Xiaowang each handed a composition to me last week.'
- b. *Xiaoli he Xiaowang ge shang-xingqi jiao-le yi-pian zuowen gei wo
Xiaoli and Xiaowang GE last-week hand-Perf one-Cl composition GEI me

Soh argues that Marantz's structure provides a basis for *GE* to be adjoined either to *vP* or *VP*, but no higher since it cannot adjoin to *TP*. Her proposed structures for double object constructions, represented by (20) and (21) on the next page, account for these findings. The additional *VP* layer allows adjunction of *GE* and maintains the asymmetrical properties desired.





Moving to the dative construction, Soh’s structure has only one VP layer to which *GE* cannot adjoin because of the aforementioned locality constraint. Since the examples above demonstrate that *GE* cannot reside between the objects, nor at the end of the sentence, it follows that the only place *GE* can reside is within the dative structure is adjoined to vP, as in (22). This structure mirrors that of the double object construction in (21) to show that *GE* can precede the verb. If the two structures are compared side by side, the existence of a VP boundary between the arguments in double object constructions is as Marantz and Soh predict, thus Soh’s proposal is validated.

5. The Distributive Quantifier ‘each’ in American English

Given Soh’s evidence that double object constructions have a distinct, more complex underlying structure than dative construction as demonstrated with the distributive quantifier *GE*, I sought to determine whether *each* in American English produces similar results. To compare the structure of dative constructions containing *each* to those of the double object, I prepared a matrix of

sentences for evaluation of grammaticality. I chose the commonly cited verb *give*, with the arguments involving *teacher*, *book*, and *student* which function as subject (agent), direct object (theme), and indirect object (goal/recipient) respectively.

Next, I looked at the placement of *each*. In English, unlike in Mandarin Chinese, there are multiple functions for *each* as a distributive element. As such, mapping the properties from *GE* in Mandarin Chinese to a form of *each* in English is complicated, as (23) illustrates.

- 23a. *Each* teacher/*each* of the teachers gave a book to the student.
- b. The teachers gave a book to *each* other.
- c. The teacher gave the students a book *each*.
- d. The teacher gave a book *each* to the students.
- e. A student *each* was given a book (by the teachers).
- f. The teachers *each* gave a book to the student.

In (23a), *each* functions as a determiner, identified as partitive *each*, while in (23b), it functions as a reflexive anaphor. Both examples are easily recognizable as part of a NP which do not have a role in Soh's proposal of the verb phrase and are thus excluded. Examples (23c-23e) are not so straightforward. This type of usage, identified as *binomial each* by Safir & Stowell (1987), is also a distributive quantifier, but it behaves differently than the adverbial distributive quantifier *GE*. Safir and Stowell show that binomial *each* is a constituent of the NP related to partitive *each*, while adverbial *each* is a constituent of the VP. Since binomial *each* resides within an NP, it too should be ruled out for the purpose of this paper, but first it must be clearly identified.

In (23d) and (23e), binomial *each* appears in what seems to be the same position as adverbial *each* shown in (23f). For clarification, note also that (23e) is a passive construction and thus a different structure altogether; something for investigation during future research on this subject.

One way to identify whether *each* is binomial or adverbial is by listening for the intonation break. In her dissertation, Soh refers to Choe (1987) in noting that the intonation break

falls before *each* in adverbial usage, but after *each* in binomial usage as shown in (24) with the symbol # to mark the break.

- 24a. They # each gave John a book.
 b. I gave two books each # to John and Mary..

Another method that intuitively came to mind as I analyzed the data was to replace *each* with *apiece*, since it does not have an adverbial counterpart as (25) illustrates.

- 25a. *The teachers *apiece* gave a book to the student.
 b. The teacher gave a book *apiece* to the students.

It is worth noting that *GE* in Mandarin Chinese has properties of binomial *each* and adverbial *each* which affects the comparison of the distributive quantifiers in the two languages. These issues will be discussed as relevant.

From a linear perspective, there are four possible locations for *each* to reside given that the verb phrase contains three arguments plus the verb, as (26) illustrates.

26. [Subject¹ Verb² Object³ Object⁴]

Since the terms dyadic and binomial both refer to distributive properties which involve NPs, and NP's vary in number and definiteness, limiting the set of variables was my next order of business. With two constructions (dative and double object), four linear positions of *each*, and the twelve noun phrase variables, the corpus of possible sentences generated was 512, a number too large to manage. I chose to vary variables that I felt were of secondary importance, subject definiteness and direct object plurality. This reduced the number to 128, 64 for each construction. I limited the definiteness of the subject because the subject can only function as a sorting key whose only requirement is that it be plural. Similarly, the only requirement on the distributive share is that it be indefinite, thus plurality is irrelevant. Going on the assumption that

the direct object could not function as sorting key, I chose only singular direct objects for my analysis. In retrospect, the limitation on these variables may well be a predetermination of the data, though I left both open for reanalysis as I will discuss later.

Looking at the matrix, several patterns emerged. First, I was able to eliminate the second position of *each*, between the verb and the first complement, because none of the sentences with this order generated a grammatical sentence, an example of which is shown in (27).

27. *The teachers gave *each* a book to the students.

This parallels Soh's examples and her proposal that the distributive quantifier adjoins to vP or inner VP, but not to V'. I was also able to eliminate the fourth position for adverbial *each* because as anticipated, the only grammatical sentences contained binomial *each* in double object constructions as shown in (28). Soh's proposal rules this position out by the violation of licensing condition (16iv), the distributive quantifier must c-command the distributive share.

28a. *The teachers gave a book to the students *each*.
 b. The teachers gave the students a book *each/apiece* #.

The third position, between the internal arguments, generated grammatical sentences in both constructions. As shown in (29a), the dative construction contains binomial *each*, evidenced by the intonation break and the grammaticality of *apiece*. This too is contrary to Soh's proposal which does not permit *GE* to appear between the arguments in the dative construction. In (29b), however, *each* is adverbial and therefore evidence of the additional VP layer. Clearly, binomial *each* functions differently than *GE*.

29a. The teachers gave a book *each/apiece* to the students.
 b. The teacher gave the students # *each*/**apiece* a book.

The next result I noticed was that all sentences with a definite direct object produced ungrammatical sentences. I anticipated this result because according to Soh (2005), adverbial *each* must bind an indefinite expression. There is, however, an exceptions shown in (30).

30a. *?The teachers *each* gave the book to the student.

There are sentences in this group that can be interpreted to have a definite distributive share. In this example, the NP being distributed is syntactically definite, but the implication could be that *a copy of the book*, an indefinite NP, is being distributed by the sorting key *the teachers*. Since the interpretation is semantic rather than syntactic, I ruled these sentences ungrammatical.

Another result apparent in the dative constructions was that a singular subject always generated an ungrammatical sentence. Again there are examples which seem to violate this rule as in (31), but closer examination determines these to be instances of binomial *each* rather than adverbial *each* and thus do not apply to the theory in question.

- 31a The teacher gave a book *each/apiece* # to the student
 b. The teachers gave a book *each/apiece* # to the student

Like in Soh's proposal, adverbial *each* may not reside between the two internal arguments in dative constructions, the structures of which will illustrate this point.

With the remaining data, I searched for patterns in grammaticality from which I could generalize the use of the distributive quantifier *each*. Again as anticipated, for adverbial *each* to appear before the verb, the agent is the sorting key and must be plural; and the theme is the distributive share and must be indefinite. This holds for both dative and double object constructions. A quick look back at the excluded variables shows neither affects the grammaticality of the sentence: the sorting key, in these examples the agent, can be either

definite or indefinite, but must be plural as shown in (32), and the distributive share, the theme in these examples, can be singular or plural, but must be indefinite as in (33).

- 32a. The teachers/two teachers # *each* gave the student(s) a book.
- d. The teachers/two teachers # *each* gave a book to the student(s).

- 33a. The teachers # *each* gave the student(s) a book/two books.
- b. The teachers # *each* gave a book/two books to the student(s).

For adverbial *each* to appear between the two internal arguments, the subject becomes irrelevant as the goal/recipient becomes the sorting key while the theme remains the distributive share. The same from (16) apply, the goal/recipient must be plural, and the distributive share must be indefinite as shown in (34).

- 34a. The teacher(s) gave the students # *each* a book/two books.
- b. *The teacher(s) gave the student *each* a book/two books.

For double object constructions, the result is straightforward by simply following the established definition. Adverbial *each*, however, cannot occur between the internal arguments in dative constructions because both c-command requirements from (16) are violated as shown in (35).

Rather, the results show that it is binomial *each* that occupies this position.

- 35a. The teacher gave a book *each/apiece* # to the students.
- b. *The teacher gave a book *each* to the student.

This parallels Soh's analysis and proposal that the double object structure is more complex.

To be thorough, I again revisit the excluded variables to see if they pose a problem. Once again the definiteness of the agent proves to be irrelevant. Plurality of the agent, however poses one puzzling piece of data as show in (36).

- 36. ?The teachers gave a student *each/?apiece* #a book.

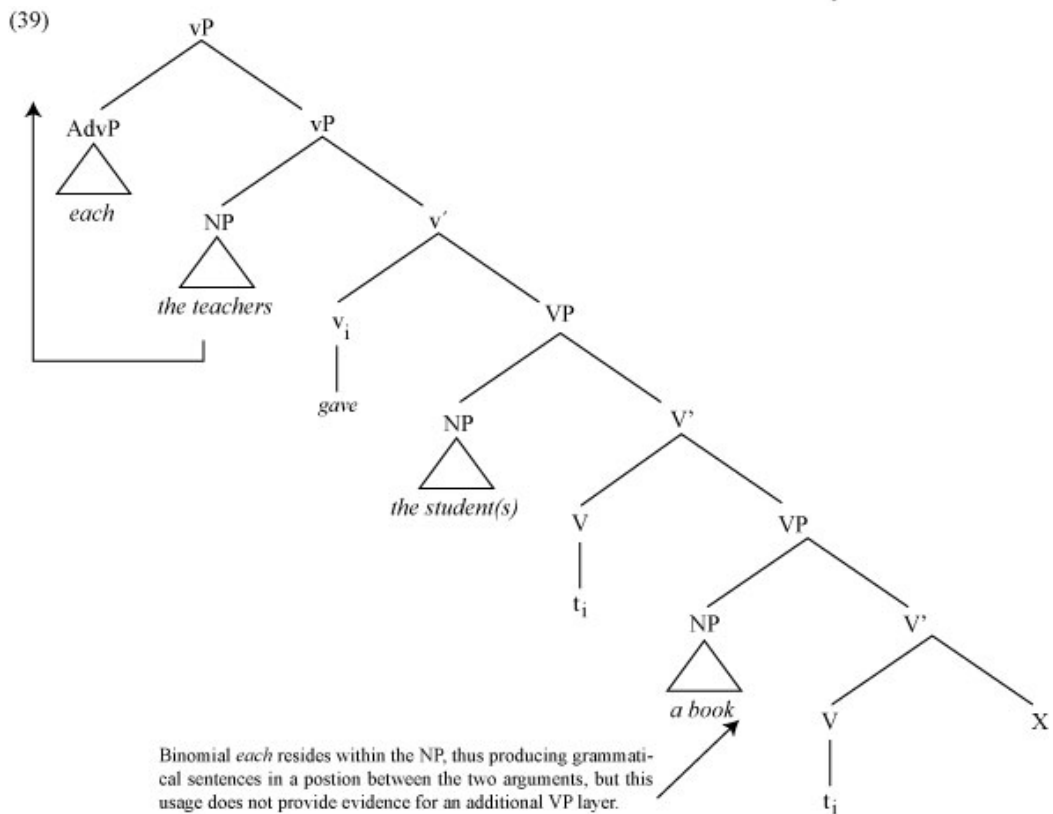
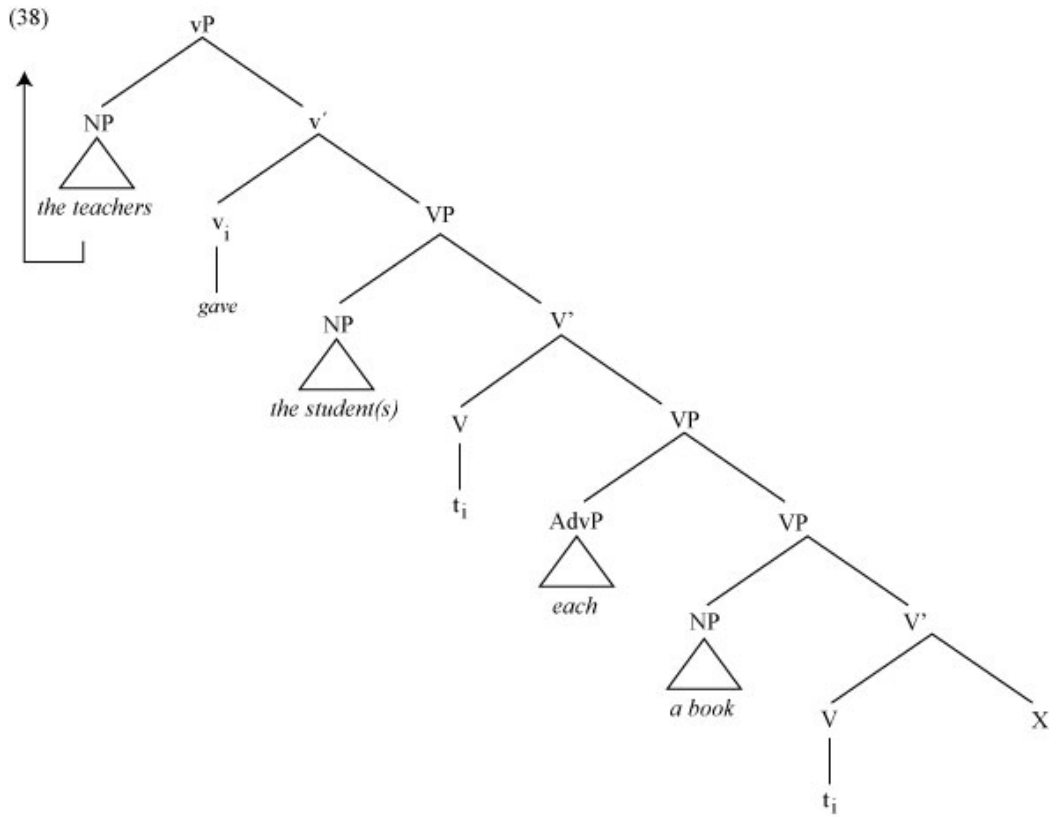
Soh (2005) discusses the notion of a locality condition in which the distributive quantifier must be immediately adjacent to the plural argument. At first glance, the questionable readings for (36) seem to stem from a violation of the locality condition. A closer look shows that this is an instance of binomial *each*. What is curious about (36) is that the goal/recipient seems to have the role of distributive share, somewhat contrary to my intuition and worthy of further exploration.

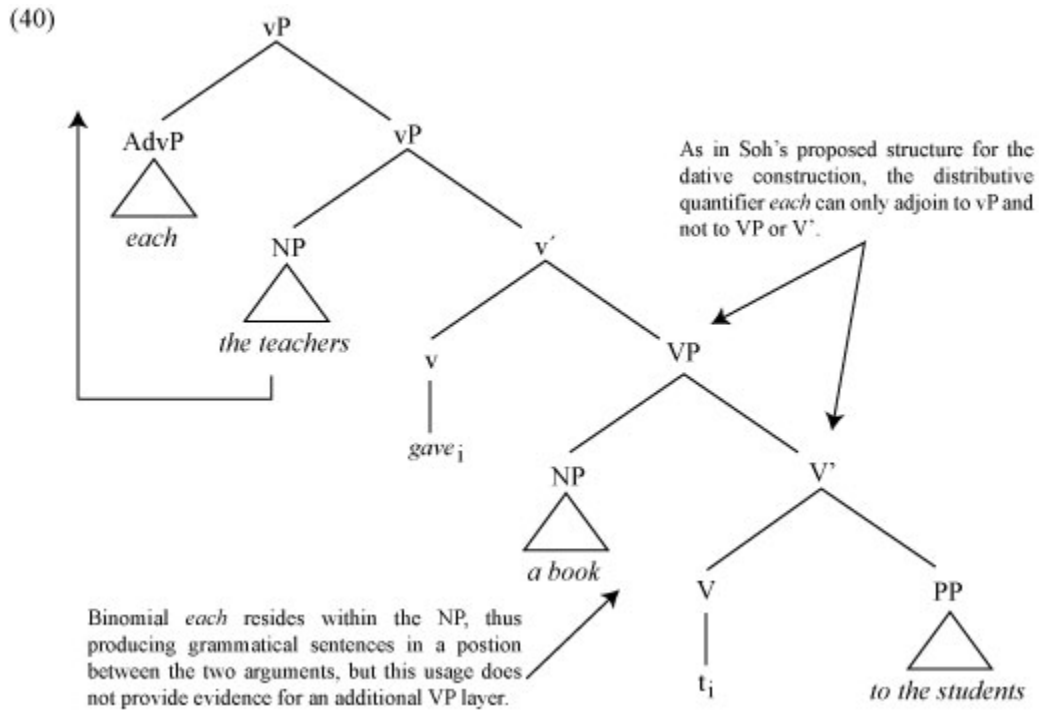
Revisiting the plurality of the theme also differs by the construction. In double object constructions, where the theme is the distributive share, plurality is not relevant for the same reason as before, it need only be indefinite. The dative construction with a plural theme presents a potential problem to the assigning of sorting key and distributive share to the NPs.

Theoretically, there is nothing that states that the sorting key cannot be the theme, or that the distributive share cannot be the goal/recipient, although by my intuition, this seems illogical. Soh (1998) gives an example in which she suggests such a possibility as shown in (37).

37. *?He gave Mickey and Donald *each* to a boy.

She suggests that the plural NP *Mickey and Donald* functions as the sorting key and *a boy* functions as the distributive share. Again my intuition balks at this analysis, thinking that it must be the other way around, yet by definition, a distributive share must be indefinite, and a sorting key must be plural. Certainly this issue is worthy of further research.





6. Project Summary and Introspection

Having analyzed the data to the extent possible within the scope of this paper, I refer now to the double object structures illustrated in (38) and (39), and the dative structure in (40) to summarize my findings and offer my insight on this and future projects. To a large extent, my findings fall in line with Soh (2005). In comparing my structures for adverbial *each* with Soh's, the only variance is that *each* functions differently in American English and as such, it can appear places that are unacceptable in Mandarin Chinese. Since these additional locations reside within an NP, the data does not provide evidence against her theory. On the contrary, the data supports her analysis that double object constructions have a more complex verb phrase structure than do

dative constructions. The data also provides evidence for her theory that the distributive quantifier adjoins to vP or inner VP, but not to TP or V'.

The data is not without issues however, a fact that offers future research opportunities in the area of double complement constructions as there is much more theory on the subject than is covered in this paper. There is also the environment and rules for distributive quantifier as it pertains to theta roles. And of course there is the opportunity to expand these theories to other languages. By no means is my study of double object and dative constructions merely scholastic history, and I predict it will be revisited as soon as the next semester.

Though my research has led me from one new idea to the next, sometimes in overwhelming fashion, the process and the knowledge will surely prove invaluable. Syntactic theory is nothing less than thought-provoking, sometimes exasperating, and to me, always interesting. This project has challenged my mind to think in different ways, to present my findings in different ways, and to use my intuition, but not to predetermine the data. It has taught me how to synthesize a large amount of data and apply the theories of others to my own research. It has given me the opportunity to work with professors and graduate students as a taste of what it means to be a graduate student. But most of all, it has given me the confidence that I can undertake a large academic project, complete it in a timely manner, and add value to the academic community.

Appendix A1

Dative Constructions with ditransitive <i>give</i> and distributive quantifier <i>each</i>			
<i>Definite DO</i>		<i>Singular Definite Subject</i>	<i>Plural Definite Subject</i>
SingDefIO	1	*The teacher each gave the book to the student	③ The teachers each gave the book to the student
	2	*The teacher gave each the book to the student	*The teachers gave each the book to the student
	3	*The teacher gave the book each to the student	*The teachers gave the book each to the student
	4	*The teacher gave the book to the student each	*The teachers gave the book to the student each
PluDefIO	1	*The teacher each gave the book to the students	③ The teachers each gave the book to the students
	2	*The teacher gave each the book to the students	*The teachers gave each the book to the students
	3	*The teacher gave the book each to the students	*The teachers gave the book each to the students
	4	*The teacher gave the book to the students each	*The teachers gave the book to the students each
SingIndefIO	1	*The teacher each gave the book to a student	③ The teachers each gave the book to a student
	2	*The teacher gave each the book to a student	*The teachers gave each the book to a student
	3	*The teacher gave the book each to a student	*The teachers gave the book each to a student
	4	*The teacher gave the book to a student each	*The teachers gave the book to a student each
PluIndefIO	1	*The teacher each gave the book to some students	③ The teachers each gave the book to some students
	2	*The teacher gave each the book to some students	*The teachers gave each the book to some students
	3	*The teacher gave the book each to some students	*The teachers gave the book each to some students
	4	*The teacher gave the book to some students each	*The teachers gave the book to some students each
<i>Indefinite DO</i>		<i>Singular Definite Subject</i>	<i>Plural Definite Subject</i>
SingDefIO	1	*The teacher each gave a book to the student	The teachers each gave a book to the student
	2	*The teacher gave each a book to the student	*The teachers gave each a book to the student
	3	*The teacher gave a book each to the student	① The teachers gave a book each to the student
	4	*The teacher gave a book to the student each	*The teachers gave a book to the student each
PluDefIO	1	*The teacher each gave a book to the students	The teachers each gave a book to the students
	2	*The teacher gave each a book to the students	*The teachers gave each a book to the students
	3	① The teacher gave a book each to the students	① The teachers gave a book each to the students
	4	*The teacher gave a book to the students each	*The teachers gave a book to the students each
SingIndefIO	1	*The teacher each gave a book to a student	The teachers each gave a book to a student
	2	*The teacher gave each a book to a student	*The teachers gave each a book to a student
	3	*The teacher gave a book each to a student	① The teachers gave a book each to a student
	4	*The teacher gave a book to a student each	*The teachers gave a book to a student each
PluIndefIO	1	*The teacher each gave a book to some students	The teachers each gave a book to some students
	2	*The teacher gave each a book to some students	*The teachers gave each a book to some students
	3	① The teacher gave a book each to some students	① The teachers gave a book each to some students
	4	*The teacher gave a book to some students each	*The teachers gave a book to some students each

- * Unacceptable
- ? Questionable
- ① *Binomial each*
- ② Acceptable if interpreted as passing over the singular object
- ③ Acceptable if interpreted as an indefinite direct object

Appendix A2

Double Object Constructions with ditransitive <i>give</i> and distributive quantifier <i>each</i>		
<i>Definite DO</i>	<i>Singular Definite Subject</i>	<i>Plural Definite Subject</i>
SingDefIO	1 *The teacher each gave the student the book	③The teachers each gave the student the book
	2 *The teacher gave each the student the book	*The teachers gave each the student the book
	3 *The teacher gave the student each the book	*The teachers gave the student each the book
	4 *The teacher gave the student the book each	*The teachers gave the student the book each
PluDefIO	1 *The teacher each gave the students the book	③The teachers each gave the students the book
	2 *The teacher gave each the students the book	*The teachers gave each the students the book
	3 *The teacher gave the students each the book	③The teachers gave the students each the book
	4 *The teacher gave the students the book each	*The teachers gave the students the book each
SingIndefIO	1 *The teacher each gave a student the book	③The teachers each gave a student the book
	2 *The teacher gave each a student the book	*The teachers gave each a student the book
	3 *The teacher gave a student each the book	*The teachers gave a student each the book
	4 *The teacher gave a student the book each	*The teachers gave a student the book each
PluIndefIO	1 *The teacher each gave some students the book	③The teachers each gave some students the book
	2 *The teacher gave each some students the book	*The teachers gave each some students the book
	3 *The teacher gave some students each the book	③The teachers gave some students each the book
	4 *The teacher gave some students the book each	*The teachers gave some students the book each
<i>Indef DO</i>	<i>Singular Definite Subject</i>	<i>Plural Definite Subject</i>
SingDefIO	1 *The teacher each gave the student a book	The teachers each gave the student a book
	2 *The teacher gave each the student a book	*The teachers gave each the student a book
	3 *The teacher gave the student each a book	*The teachers gave the student each a book
	4 *The teacher gave the student a book each	*The teachers gave the student a book each
PluDefIO	1 *The teacher each gave the students a book	The teachers each gave the students a book
	2 *The teacher gave each the students a book	*The teachers gave each the students a book
	3 The teacher gave the students each a book	The teachers gave the students each a book
	4 ①The teacher gave the students a book each	①The teachers gave the students a book each
SingIndefIO	1 *The teacher each gave a student a book	The teachers each gave a student a book
	2 *The teacher gave each a student a book	*The teachers gave each a student a book
	3 *The teacher gave a student each a book	②?The teachers gave a student each a book
	4 *The teacher gave a student a book each	*The teachers gave a student a book each
PluIndefIO	1 *The teacher each gave some students a book	The teachers each gave some students a book
	2 *The teacher gave each some students a book	*The teachers gave each some students a book
	3 The teacher gave some students each a book	The teachers gave some students each a book
	4 ①The teacher gave some students a book each	①The teachers gave some students a book each

- * Unacceptable
- ? Questionable
- ① *Binomial each*
- ② Acceptable if interpreted as passing over the singular object
- ③ Acceptable if interpreted as an indefinite direct object

Works Cited

- Aoun, J. and Li, Y.-H. A. 1989. "Scope and constituency." *Linguistic Inquiry* 20: 141-172.
- Barss, Andrew and Lasnik, Howard. 1986. "A note on anaphora and double objects." *Linguistic Inquiry* 17: 347-354.
- Bruening, Benjamin. 2001. "QR Obeys Superiority: Frozen Scope and ACD." *Linguistic Inquiry* 32: 233–273.
- Choe, Jae-Woong. 1987. *Anti-Quantifiers and a Theory of Distributivity*. Ph.D. dissertation, University of Massachusetts, Amherst.
- Chomsky, Noam. 1955/1975. *The Logical Structure of Linguistic Theory*. Chicago, University of Chicago Press.
- Harley, Heidi. 2000. "Possession and the Double Object Construction," Ms., University of Arizona.
- Huang, C.-T. James. Huang, C-T James (2002) "Distributivity and reflexivity," in Tang and Liu (eds.) *The Formal Way to Chinese Languages*, CLSI and Chicago University Press, 2002.
- Jackendoff, Ray. 1990. "On Larson's treatment of the double object construction." *Linguistic Inquiry* 21(3): 427-456.
- Kung, Hui-I. 1993. The mapping hypothesis and postverbal structures in Mandarin Chinese. Doctoral dissertation, University of Wisconsin, Madison.
- Larson, Richard K. 1988. "On the double object construction." *Linguistic Inquiry* 19(3): 335-391.
- Larson, Richard K. 1990. "Double objects revisited: reply to Jackendoff." *Linguistic Inquiry* 21(4): 589-632.
- Lin, Tzong-Hong. 1998. On Ge and Other Related Problems, in Liejiong Xu, ed., *The Referential Properties of Chinese Noun Phrase*, Collection des Cahiers de Linguistique, Asie Oriental 2, Reg. Recettes Cahiers de Linguistique, Paris.
- Marantz, Alec. 1993. "Implications and Asymmetries in Double Object Constructions," in Sam A Mchombo (ed.), *Theoretical Aspects of Bantu Grammar* 1, CSLI Publications, Stanford, pp. 113-150.
- Nissenbaum, Jonathan (2000), Investigations of Covert Phrase Movement. Ph.D. thesis, Massachusetts Institute of Technology. Distributed by MIT Working Papers in Linguistics, Cambridge, Mass.
- Pesetsky, David. 1995. *Zero Syntax: Experiencers and Cascades*. Cambridge, MA: The MIT Press.
- Safir, Ken and Stowell, Tim. 1988 Binominal each. In *Proceedings of the Northeast Linguistic Society*, volume 18, pages 426–450, 1989.

Soh, H L. (1998). Object scrambling in Chinese. Doctoral dissertation, MIT. Cambridge, Massachusetts.

Soh, H L. 2005. "Mandarin distributive quantifier GE "each", the structures of double complement constructions and the verb-preposition distinction." *Journal of East Asian Languages*.