

On Functional Aspects of Tightness in Coordinate Structure

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I. Introduction

This paper does not pretend to be a thorough examination of the functional aspects which may be included in SI-2 rules of Chomsky's Model of Core Grammar.¹⁾ Rather it is an attempt to show that the functional aspects of tightness (or looseness) chiefly determined by the structure have an effect on Deletion rules of PF component and on the rules of coreference in SI-1 rules of the Model.

For the goal of this work, I will be dealing with such phenomena as Particle Deletion of Korean, so-called Backward Pronominalization, and Gapping and VP Deletion, with respect to the structure of coordinate conjunction.²⁾

1) Note that Chomsky's Model of Core Grammar may be schematically represented as (23). In (23) SI-1 Rules include Rules of Construal, Rules of Quantifier Interpretation, Rules of focus, etc., as mentioned in section V.

2) There are three common coordinate conjunctions in English: *and*, *or*, and *but*. Note, however, that in this paper the coordinate conjunction implies only *and*.

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II. Particle Deletion

Consider the following Korean sentences in (1) and (2).

- (1) a. John-nin mackju-lil masi-ko Tom-nin soju-lil masin-ta
 John-TOP beer-AC drink-and Tom-TOP soju-AC drink-DEC³⁾
 b. John-nin mackju-ϕ masi-ko Tom-nin soju-ϕ masin-ta
 c. ? John-nin mackju-ϕ masi-ko Tom-nin soju-lil masin-ta
- (2) a. *John-nin mackju-lil gwa soju-lil masin-ta
 John-TOP beer -AC and soju-AC drink-DEC
 b. John-nin mackju-ϕ gwa soju-ϕ masin-ta
 c. John-nin mackju-ϕ gwa soju-lil masin-ta

Sentences in (1) are the case in which the two conjuncts⁴⁾ combined by the coordinate conjunction *ko*, an equivalent of English *and*, are sentences. Sentences in (2) are, on the other hand, the case in which the two conjuncts are conjoined by another coordinate conjunction *gwa*.⁵⁾

Now let us first observe the difference in grammaticality between (1a) and (2a) with respect to the possibility of deleting the accusative particle *lil*. The most outstanding contrast is that in (1a) it is possible for the accusative particle *lil* to be in both conjuncts while it is impossible to be in both conjuncts in (2a). As in (2b, c), in (2a) in which it is NP's that are

- 3) The abbreviations are as follows: AC=Accusative Marker; DEC=Declarative Marker; TOP=Topic Marker
 4) Conjuncts used in this paper is equivalent to conjoins by other grammarians. Note, therefore, that conjuncts in this paper should be distinguished from the term which is generally called for the linking adverbials.
 5) Note in passing that in Korean there are two types of coordinate conjunctions -*ko* and -*gwa*, the choice of which is syntactically conditioned: -*gwa* is used to conjoin NP's and -*ko* is used elsewhere. Refer to the following contrasts with respect to the choice of the two coordinate conjunctions.

- (I) John-nin [NP mackju] - { *ko / gwa } [NP soju] - lil masin-ta
 John-TOP beer and soju-AC drink-DEC
- (II) John-nin [VP mackju-lil masi] - { *gwa / ko } [VP soju-lil masin-ta]
- (III) [S John-nin mackju-lil masi] - { *gwa / ko } [S Tom-nin soju-lil masin-ta]

conjoined, at least the accusative particle of the first conjunct should be deleted to be acceptable. What is further observed in (1a, b, c) is that all the three sentences are cognitively synonymous, but they are not functionally equivalent. That is, (1a) is most contrastive with *li* in both conjuncts; (1b) is less contrastive with *li* deleted in both conjuncts. Note in passing that the contrastiveness is well realized when the two conjuncts are in parallelism. In this respect (1c) is least contrastive since the deletion of the accusative particle *li* is applied only in the one conjunct, more specifically in the first conjunct,⁶⁾ resulting in the collapse of parallelism.

Consider further the following Korean sentences.

- (3) a. John-nin mackju-lil ϕ Tom-nin soju-lil masin-ta
 John-TOP beer-AC Tom-TOP soju-AC drink-DEC
 b. ?John-nin mackju- ϕ ϕ Tom-nin soju- ϕ masin-ta
 c. *John-nin mackju- ϕ ϕ Tom-nin soju-lil masin-ta

It has been assumed that (3a, b, c) are derived from (1a, b, c) respectively by the rule of *masi-ko* (that is, *drink and*) deletion, a kind of Gapping, which will be further discussed later. As in (1a, b, c) even when Gapping is applied the degree of contrastiveness is chiefly conditioned by the deletion of the accusative particle *li*. More specifically, (3a) is most contrastive; (3b) is less contrastive than (3a); and (3c) is least contrastive. Hence, (3a) is clearly acceptable while (3b) is less acceptable and (3c) is almost unacceptable.

Now let us examine what happens in (2). In (2) *mackju* and *soju* are assumed to be one unit rather than two separate units. Since the two NP's are perceived as one, one of the two accusative particles is not necessary to mark the case and the particle of the first conjunct should be deleted.⁷⁾ Unlike the case of (1), in (2) it is simultaneity that is felt with respect to coordinate structure. Note that it is clearly possible to replace the first conjunct *mackju* with the second conjunct *soju*. However, such is not the case with (1). Hence the following contrast in (4)-(7).

6) If the accusative particle *li* is deleted only in the second conjunct with it remained in the first conjunct, then the sentence becomes still worse. Compare the following (ii) with (1c), which is repeated here as (i).

(i) ?John-nin mackju- ϕ masi-ko Tom-nin soju-lil masin-ta [= (1c)]
 (ii) ??John-nin mackju-lil masi-ko Tom-nin soju- ϕ masin-ta

7) Hence the acceptable (2c). Compare (2c) with the following (i).

(i) *John-nin mackju-lil gwa soju- ϕ masin-ta

Note that in exactly the same situation the following two sentences are more acceptable than (i).

(ii) ?John-nin mackju-lil masi-ko soju- ϕ masin-ta
 (iii) ??John-nin mackju-lil masi-ko Tom-nin soju- ϕ masin-ta

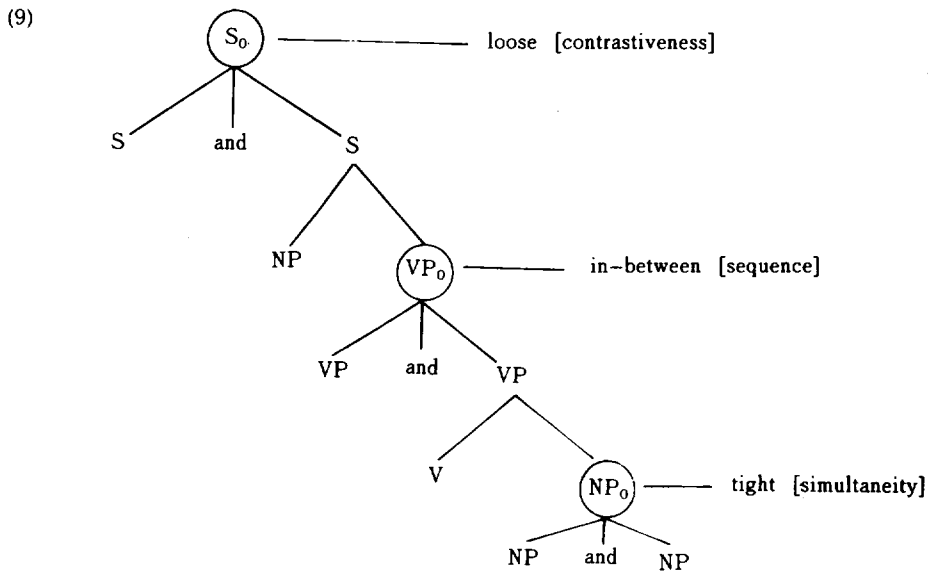
- (4) a. John-nin mackju- ϕ gwa soju- ϕ masin-ta [= (2b)]
 b. John-nin soju- ϕ gwa mackju- ϕ masin-ta
- (5) a. John-nin mackju- ϕ gwa soju-lil masin-ta [= (2c)]
 b. John-nin soju- ϕ gwa mackju-lil masin-ta
- (6) a. John-nin mackju-lil masi-ko Tom-nin soju-lil masin-ta [= (1a)]
 b. John-nin soju-lil masi-ko Tom-nin mackju-lil masin-ta
- (7) a. John-nin mackju- ϕ masi-ko Tom-nin soju- ϕ masin-ta [= (1b)]
 b. John-nin soju- ϕ masi-ko Tom-nin mackju- ϕ masin-ta

In (4) and (5) the a-sentences are cognitively equivalent to the b-sentences. In (6) and (7), however, the a-sentences are completely different from the b-sentences. So far, I have pointed out that in the sentential conjunction the two conjuncts are characterized by contrastiveness while in the nominal conjunction they are characterized by simultaneity. This observation leads to the conclusion that the two functional concepts of contrastiveness and simultaneity seem to be dependent on the difference in structure in relation to the coordinate conjunction. On the basis of this observation I claim that sentences are loosely conjoined and perceived as two separate conjuncts, each of which can have its own accusative particle, and that noun phrases are tightly conjoined and perceived as one unit and thus they do not allow the two accusative particles to remain in each conjunct.

Now let us turn to the case in which the two VP's are conjoined. Consider the following sentences.

- (8) a. John-nin mackju-lil masi-ko soju-lil masin-ta
 John-TOP beer-AC drink-and soju-AC drink-DEC
 b. John-nin mackju- ϕ masi-ko soju- ϕ masin-ta
 c. John-nin mackju- ϕ masi-ko soju-lil masin-ta

All the three sentences in (8) are acceptable. In the light of the possible (8a) it seems not to be so extremely tight as (2a). In the light of the possible (8c), on the other hand, it seems not to be so loose as (1c). In other words, when the VP's are conjoined they are neither tight enough to represent simultaneity nor loose enough to represent contrastiveness. They are in fact in-between. Note that in (8) the two VP's are characterized by the sequence of two different occurrences. On the basis of what I have observed so far, the comparison of tightness in coordinate structure may be represented as follows.



III. Backward Pronominalization

Langacker(1969) proposed his constraint (b) on so-called backward pronominalization: NP^a may be used to pronominalize NP^p unless (1) NP^p precedes NP^a and (2) NP^a and NP^p are elements of separate conjoined structures. This constraint is considered necessary to account for the following sentences in which the two italicized NP's are in a coreferential relation.

- (10) **He* has a lot of talent and *Peter* should go far.
- (11) **She* is almost blind and I won't feel safe on the road if you allow *this woman* to drive.
- (12) *Penelope cursed *him* and slandered *Peter*.
- (13) *Penelope cursed *him* and thanked the woman who helped to subdue *the man*.
- (14) **His* wife and the woman *Peter* is living with just met.
- (15) *I met a woman who was dying to find out more about *him* and another who had just been wronged by *that man*.

According to Langacker's constraint (b), all of these sentences are judged to be ungrammatical since in each of the above sentences NP^p precedes NP^a and they are in separate conjoined structures. Note, however, that Hinds(1975) pointed out that all the sentences above are not ungrammatical unless the pronouns of the first conjuncts receive stress. And Langacker's constraint(b) is to be modified into the following.

(16) NP^a may not be used to pronominalize NP^p if NP^a and NP^p are elements of separate conjoined structure, NP^p precedes NP^a, and NP^p is stressed.

Hinds seems to be almost correct. However, (16) is not perfectly correct with regard to the judgment of the grammaticality of (10)–(15). Note here that they are not grammatical in exactly the same degree under the condition of being unstressed on the pronoun. This is to some extent supported by the observation that the above (10)–(15) may be paraphrased by means of subordination. Consider the following.

- (10)' Because *he* has a lot of talent, *Peter* should go far.
- (11)' Because *she* is almost blind, I won't feel safe on the road if you allow *this woman* to drive.
- (12)' When Penelope cursed *him*, he slandered *Peter*.
- (13)' When Penelope cursed *him*, he thanked the woman who helped to subdue *the man*.
- (14)' *His* wife just met the woman who *Peter* is living with.
- (15)' ??

So far, it has been observed that according to Langacker (10)–(15) are, in the same degree, ungrammatical and that according to Hinds they are, in the same degree, grammatical. Unlike Langacker or Hinds, I would like to claim here that those sentences are not the same at all in the degree of grammaticality. Rather there is a grammatical difference and it will be primarily conditioned by the structural tightness of the conjoined structures.

What follows will repeatedly show that sentences are loosely conjoined while noun phrases are tightly conjoined and verb phrases are in-between in the degree of the structural tightness, just as in what has been shown in the previous discussion of particle deletion. Notice first that the above six sentences may be divided into three main groups, depending on which constituents are conjoined. In (10) and (11), it is sentences that are conjoined; in (12) and (13), verb phrases; and in (14) and (15), noun phrases. Given this observation, compare (10) with (12) with respect to the structure conjoined.

- (16) [_S *He* has a lot of talent] and [_S *Peter* should go far]
- (17) Penelope [_{VP} cursed *him*] and [_{VP} slandered *Peter*]

What is crucial in this analysis is the fact that (16) sounds better than (17) on the coreferential reading of the two referents. This leads to the following informal hypothesis: The higher the conjoined constituents are, the less tight they are, and thus the easier it is to reidentify the noun phrase in the second conjunct. Given this hypothesis, it is no longer difficult to predict the fact that (12) is more acceptable than (14) as a coreferential reading since the conjunct involved in the coordinate conjunction is higher in the former than in the

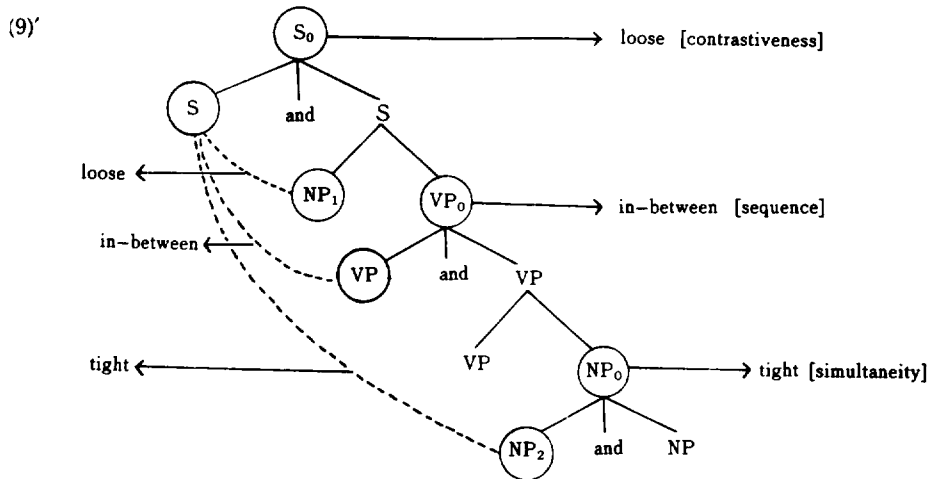
latter. Note that the fact that (10) is better than (12) and that (12) is in turn better than (14) hinges on the fact that (10)' is better than (12)' and that (12)' is better than (14)'. In fact, Bolinger(1977) pointed out that "there is a gradation of conjunctions." According to him, as in the case of (10)' and (11)' 'because' seems to make anaphora easier than 'when' as in the case of (12)' and (13)'. Thus, it seems that the analysis of the coordinate structure in terms of corresponding subordinate structure and the informal hypothesis about the coreferential reading are highly valid. As far as the structural tightness is concerned, therefore, (9) is strongly supported by the analysis of backward pronominalization as well as by the rule of Particle Deletion of Korean.

In addition, it should be noted that in each group divided above most native speakers of English view sentences like (10), (12) and (14) better than those like (11), (13) and (15) respectively. For the sake of analysis let us now examine the structures of (10) and (11), for instance.

- (18) a. [S₁ *He* has a lot of talent] and [S₁ *Peter* should go far]
- b. [S₁ *She* is almost blind] and [S₁ I won't feel safe on the road [S₂ if you allow *this woman* to drive]]

As shown in (18), the structural contrast between the two sentences seems to be related to the difference in tightness. In (18a), the pronoun *he*, which is in S₁, is coreferential with the noun phrase *Peter*, which is also in S₁. In (18b), on the other hand, the pronoun *she*, which is in S₁, is coreferential with the noun phrase *this woman*, which is in S₂. Note that this observation leads to another informal hypothesis: The higher the constituents are in the two conjuncts, the more loosely they are connected and thus the easier it is to reidentify the full-fledged noun phrase in the second conjunct.

Now consider (9), which is repeated here as (9)' with a slight modification.



According to the above hypothesis, in (9)' the encircled S of the first conjunct is most loosely connected with the encircled NP₁ of the second conjunct, less loosely connected with the encircled VP of the second conjunct and least loosely, or most tightly connected with the encircled NP₂. Thus, it seems that this hypothesis about the structural tightness provides a good basis on which the difference in coreferential reading of the two NP's separated by the coordinate conjunction can be plausibly accounted for. Observe further the following analysis.

- (19) a. Penelope [_{VP} cursed *him*] and [_{VP} slandered *Peter*]
 b. Penelope [_{VP} cursed *him*] and [_{VP} thanked the woman [_S who helped to subdue *the man*]]
 (20) a. [_{NP} *his wife*] and [_{NP} the woman [_S *peter* is living with]] just met
 b. I met [_{NP} a man [_S who was dying to find out more about *him*]] and [_{NP} another [_S who had just been wronged by *that man*]]

Given (9)', it is predicted that the two italicized NP's in (19a) are more loosely connected than those in (19b). Hence, (19a) is more coreferential than (19b) with respect to the two NP's in question. For the same reason, it is also true of (20). Thus far, I have shown that the functional aspect of tightness does really have an effect on coreferentiality.

IV. Gapping and VP Deletion

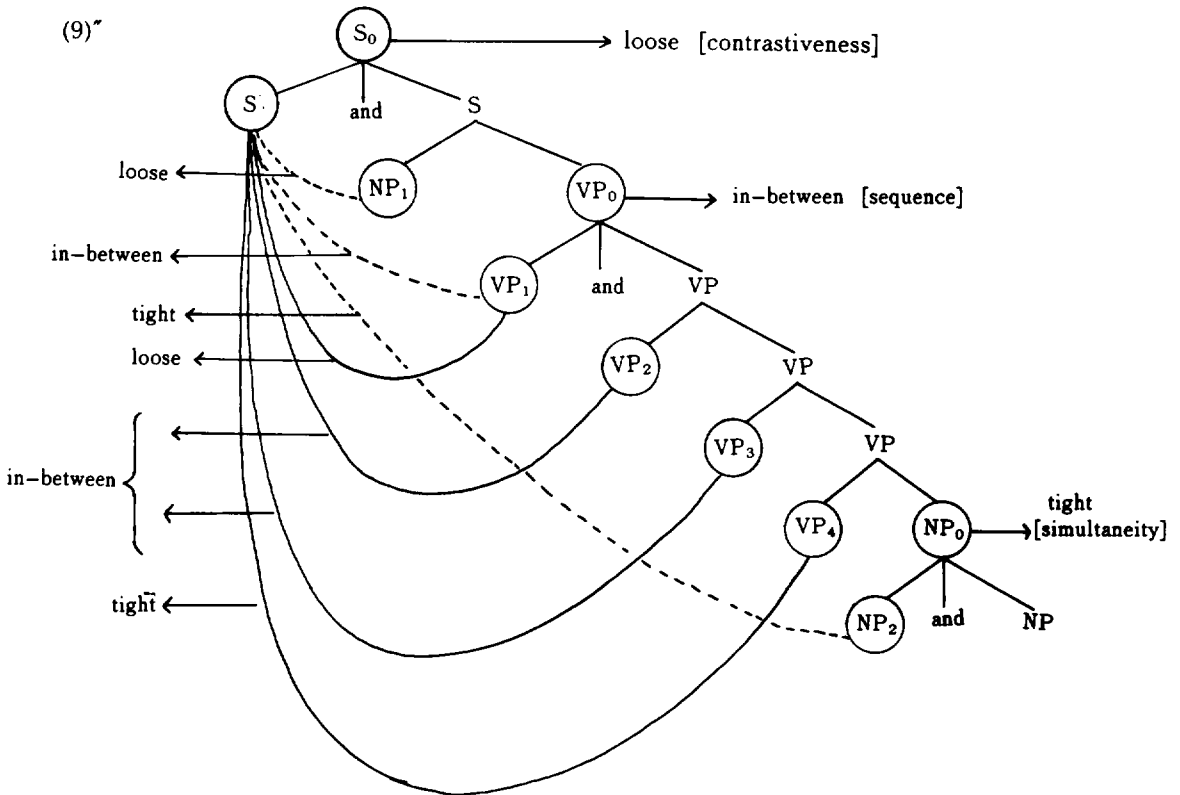
Consider the following English sentences.

- (21) a. John wants to try to begin to write a novel, and Mary wants to try to begin to write a play.
 b. John wants to try to begin to write a novel, and Mary ϕ to try to begin to write a play.
 c. John wants to try to begin to write a novel, and Mary ϕ to begin to write a play.
 d. John wants to try to begin to write a novel, and Mary ϕ to write a play.
 e. John wants to try to begin to write a novel, and Mary ϕ a play
 (22) a. John wants to try to begin to write a novel, and Mary wants to try to begin to write a novel, too.
 b. John wants to try to begin to write a novel, and Mary wants to try to begin to ϕ , too.
 c. John wants to try to begin to write a novel, and Mary wants to try to ϕ , too.
 d. John wants to try to begin to write a novel, and Mary wants to ϕ , too.
 e. John wants to try to begin to write a novel, and Mary ϕ , too.

It has been assumed that (21b, c, d, e) are derived from (21a) by the rule of Gapping and that (22b, c, d, e) are derived from (22a) by the rule of VP Deletion. Notice here that Yang(1981) has observed that they are all cognitively synonymous but are not equivalent functionally. And he pointed out that 'the more reduced the second conjunct is, the more

contrastive the non-identical elements in it become'. That is, in (21) *Mary* and *play* are most contrastive with respect to *John* and *novel* respectively in (21e) and least contrastive in (21a). In (22) *Mary* is felt most contrastive with respect to *John* in (22e) and least contrastive in (22a). Now let us look at the structure of the chain of VP's in (21) and (22). In (21b) one VP is deleted; in (21c) two VP's are deleted; in (21d) three VP's are deleted; and in (21e) four VP's are deleted downward from the top by the rule of Gapping. On the other hand, the exactly the same is true of (22) with the exception that in (22) the VP is deleted upward from the bottom. Thus, it seems to follow that the degree of contrastiveness is determined by the different scopes of application of the reduction rules. Since contrastiveness is dependent on the structural tightness, it follows that the structural tightness does affect such reduction rules as Gapping and VP Deletion.

Considering what has been observed in (21) and (22), (9)' may further be modified into (9)" below.



So far, I have shown that the functional aspects of tightness (or looseness) on which contrastiveness or simultaneity and coreferentiality etc. are dependent do really affect such reduction rules as Gapping and VP Deletion, and Particle Deletion rule and rules of

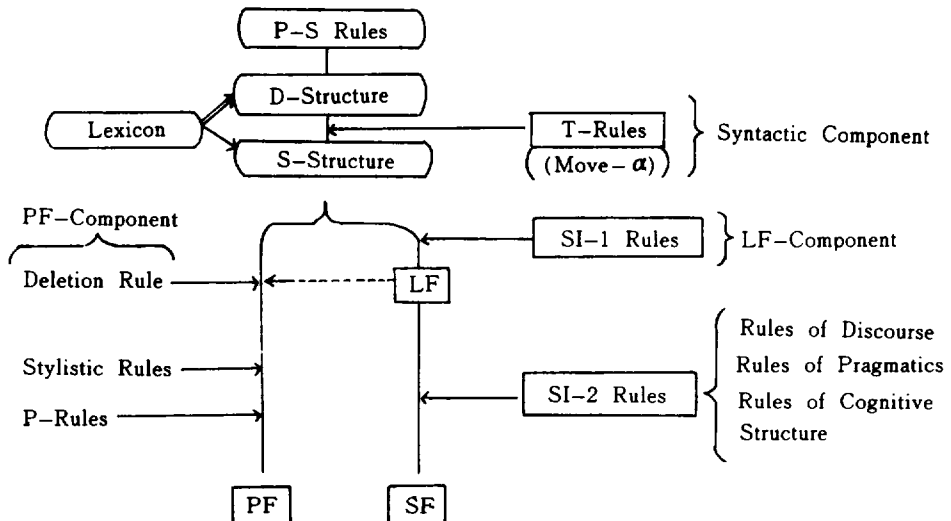
coreference with respect to the structure of coordinate conjunction. The following are what I have observed in this paper.

1. The higher the constituents of the conjoined conjuncts are, the less tight they are. That is, sentences are least tightly conjoined to be perceived as two separate units whereas noun phrases are most tightly conjoined to be perceived as one unit. And verb phrases are in-between in the degree of tightness.
2. The more reduced one conjunct is, the less tight it is with respect to the other conjunct.
3. The higher the constituent of one conjunct is, the less tightly a given constituent of the other conjunct is connected.
4. The more loosely the two conjuncts are connected, the more contrastive they are; the easier it is to reidentify the noun phrase in the second conjunct with respect to coreference; and the more possible it is to allow two independent accusative particles in the two conjuncts.

V. Conclusion

The recognition of the effect of tightness (or looseness)⁸⁾ on Particle Deletion, Gapping and VP Deletion, and coreference leads to the modification of the theoretical implications with respect to Chomsky's Model of Core Grammar. Chomsky claims that the system of Core Grammar is represented as follows.

(23)



8) We assume that the functional aspects of tightness (or looseness) discussed in this paper which determine contrastiveness, simultaneity, etc. belong to the component of SI-2 Rules in Chomsky's Model of Core Grammar.

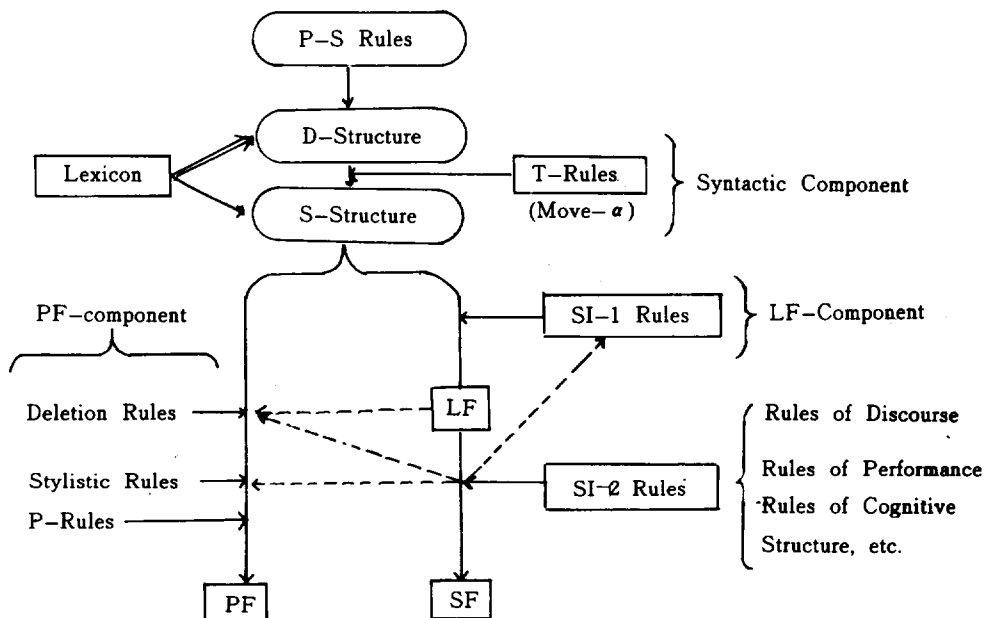
The P-S Rules generate D-Structure which T-Rules convert into S-Structure from which the Phonetic Form [=PF] is derived on the one hand and the Logical Form [=LF] is derived on the other hand. For the Phonetic Form the PF-component is involved which is composed of Deletion Rules, Stylistic Rules and Phonological Rules. For the Logical Form the LF-component is involved which includes the SI-1 Rules such as Rules of Construal, Quantifier Interpretation Rule, Wh-Interpretation Rule and Focus Interpretation Rule. The Semantic Form [=SF] is derived from the Logical Form through the SI-2 Rules which include Rules of Discourse, Rules of Pragmatics, Rules of Cognitive Structure and Rule of Performance, etc. As we see in (23) above, the only relation between the component of SI-1 and Deletion Rules is that some information from LF is necessary for the application of Deletion Rules,⁹⁾ as indicated by the dotted arrow in (23). But Chomsky's Model of Core Grammar shows no correlation between the SI-2 rules which he calls Non-Sentence Grammar and any rule of PF-component or SI-1 Rules. Note, however that Yang has pointed out that there is a correlation between SI-2 Rules and PF-component. In fact, he has shown the existence of correlation between the Deletion Rules or Stylistic Rules of PF-component and some functional aspects of SI-2 Rules.¹⁰⁾

In this paper I have examined the characteristics of the functional aspects of tightness (or looseness) by analyzing the coordinate structures. Hence (9)". The correlation between Deletion Rules of PF-component and functional aspects of tightness of SI-2 Rules was additionally supported by the discussion of Particle Deletion Rule as well as Gapping and VP Deletion. What is newly added in this paper is that SI-1 Rules are clearly correlated with SI-2 Rules since the degree of coreferentiality may depend on the degree of tightness which is assumed to belong to SI-2 Rules of Chomsky's Model. Thus, it follows that Chomsky's Model of Core Grammar (23) should be further modified into the following.

9) Cf. Chomsky(1977)

10) For the evidence of the correlation between Stylistic Rules and SI-2 Rules, refer to Yang(1981).

(24)



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국문초록

등위구조에서의 긴밀도에 관한 연구

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이 논문은 등위구조가 가지는 구조적 긴밀도에 관한 연구로서 한국어의 등위구조속에서 Accusative Particle의 삭제 가능성 여부를 살펴보고, Gapping과 VP Deletion에 작용하는 긴밀도의 기능과 그 정도를 분석하고, 소위 Backward Pronominalization에서의 대용현상과 긴밀도와의 관계를 관찰함으로써 다음과 같은 가설을 세우게 되었다.

1. 두 Conjunct의 구성요소가 상위교점에 있을수록 더 이완된 상태로 결합된다.
2. 한 Conjunct속의 어느 구성요소가 상위교점에 있을수록 다른 Conjunct의 주어진 구성요소와 더 이완된 상태로 연결된다.
3. 한 Conjunct의 구성요소가 많이 삭제될수록 이완도는 높아진다.
4. 두 Conjunct가 긴밀하게 결합될수록 동시성이 증가하고 이완되게 결합될수록 대조성이 증가한다.
5. 이완된 구조일수록 Backward Pronominalization에서의 상호지시의 정도가 높아진다.

이를 기초로 해서 촘스키의 수정확대표준이론의 모델을 약간 수정할 필요를 발견했다. 촘스키의 모델에서 비문장문법 부문이라고 제한을 해 놓은 의미해석 규칙 2-긴밀도가 여기에 속함-가 그동안 어느 정도 밝혀진 바 있는 음성형태부문의 삭제규칙과 문체규칙과의 연관성 뿐만 아니라 대용현상을 결정해주는 규칙을 포함하는 의미해석 규칙 1과도 연관이 있음을 밝혔다. 즉 이 점을 고려할 경우 촘스키의 모델은 다음과 같이 수정되어야 할 것이다.

