Conditions on Coordination and "Coordinate Structure Constraint":

A Study of Structural Resistance to Movement Transformations and Recovery Conditions

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0. In the genenerative-transformationl framework there has been two distinct trends of effort for the linguistic analysis of coordinate constructions: (1) the study of constraints on movement transformations applying to already generated coordinate structures and (2) the study of conditions on constituting coordinate structures. The objective of the present discussions is to advance the view that the seemingly distinct claims of these two trends are not distinct substantially but only mirror the two reflexive aspects of one and the same set of conditions on coordination most of which have already been envisaged in the works in the second trend. Thus, the present writer proposes to adopt a convention to the effect that transformations which generate constructions that are in violation of the set of conditions on coordination are to be constrained. This proposal, I contend, generalizes over and above the said trends and captures the common underlying factors that have given any motivation to them.[1]

This paper is organized as follows. In Section 1, I give a sketch of Ross's study(1967) with respect to chopping rules, captured as the Coordinate Structure Constraint. Section 2 is devoted to Grosu's comments on some of the difficulties involved in Ross's theory. Section 3 presents Postal's objection to Ross's coordinate condition on Pied Piping. Thus these three sections form a survey of past studies as captured in the form of constraints on transformations involving the coordinate structure. The next two sections, 4 and 5, constitute a sketchy survey of conditions on coordinate constituents as excavated and elaborated by Chomsky(1957), Smith(1969), Gleitman(1965), Lakoff-Peters(1966), and

[1] This is a revised version of an earlier paper presented orally at the 9th LRI Linguistics Conference in Seoul on October 24-5, 1975 sponsored by the Language Research Institute of Seoul National University. Claims made in this paper also appeared in its essential form in Kim(1974c). Thanks are due to Chungmin Lee, Suk-Jin Chang, and Sang Buom Cheun for lending me articles from which I benefited. Thanks are also due to In Seok Yang for letting me know of the existence of Schachter(1974), whose claim is basically the same as those of the present writer in this paper, though his view emphasizes only semantic considerations.

others. The first of them, Section 4, deals solely with Chomsky(1957) while the second, Section 5, surveys the other writers. Section 5, however, is not an overall survey of past researches but rather my own observations based on them. In Section 6 the writer attempts to discuss the significance of the set of conditions on coordination posited in the preceding section. Then on the basis of the observations, the Reflexive Effect Convention is proposed to eliminate Ross's Coordinate Structure Constraint and similar proposals. In Section 7, I show how my proposals work in all of the cases discussed in the previous sections. Also, I deal with the problems which Relativization conceived as a movement transformation poses, advancing the view that Relativization should be decomposed into three distinct elementary transformations. In the last and 8th section, I give concluding remarks with respect to the significance of my proposal in relation to the structural resistance principle that I have advanced in Kim(1973, 1974a, 1974b, 1974c).

1.0 In his M.I.T. dissertation(1967), Ross noted that a conjunct or a constituent of a conjunct may not be moved out of the coordinate structure. Note the following, for example.

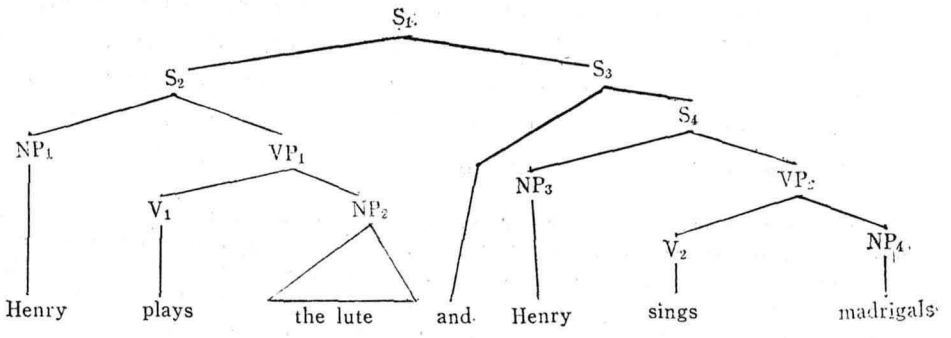
(1) a. He will put the chair between some table and some sofa.
  b. *What table will he put the chair between and some sofa?
  c. *What sofa will he put the chair between some table and?

(2) a. The lute [$_s$Henry plays the lute and sings madrigals]$_s$ is warped.
  b. *The lute which Henry plays and sings madrigls is warped.

(3) a. The madrigals [$_s$Henry plays the lute and sings madrigals]$_s$ sound lousy.
  b. *The madrigals which Henry plays the lute and sings sound lousy.

Ross observes that, while Chomsky's A-over-A Principle[2] can successfully constrain sentences like (1.b) and (1.c), it has some difficulties with cases like (2) and (3). Let's assume that the tree configuration for the embedded sentence in (2) and (3) is like (4).

(4)



[2] This principle stipulates that a rule apply to the highest node in a series of nodes of a same category, one directly dominating the other. See Chomsky(1964, p. 931).

The ill-formed (2.b) is the result of applying Relativization to NP_2 of S_2 in (4). (3.b) is the result of applying the same rule to NP_4 of S_4 in (4). In either of the cases the A-over-A Principle cannot be a solution since neither of the NP's to be relativized are dominated by an NP of the same category. Hence, as an alternative applicable to all of the cases above, Ross proposed what he called the Coordinate Structure Constraint.

(5) The Coordinate Structure Constraint(Ross 1967 : 89).

In a coordinate structure. no conjunct may be moved, nor may any element contained in a conjunct be moved out of that conjunct.

It should be noted here, incidentally, that the movement not only of a whole conjunct but also of an element of a conjunct is prohibited by this constraint.

2.0 Commenting on Ross's Coordinate Structure Constraint(hereafter abbreviated CSC) and Neubauer's contention(1970) that deletion rules are not sensitive to Ross's island constraints[3], Grosu(1973a) argues that it is not true that deletion rules are insensitive to CSC but that deletion of a conjunct is sensitive to CSC while deletion of an element of a conjunct is not. Consequently, he contends that CSC has a nonunitary nature and that only the portion of CSC constraining the movement of the whole conjunct must preferably be retained. First, note the following examples given by Neubauer.

(6) a. John believes that it is dangerous (for him) to shave himself with a rusty blade and that he must never use a blade more than twice. (Super-Equi)

b. I could not lift this sword, but I know a boy who could (lift this sword) and I am scared of him. (VP Deletion)

c. John may have been shot by someone, but I don't know who (may have shot him) and nobody cares anyway. (Sluicing)

d. Somebody seduced Bill's sister, but no one will ever seduce Jack's (sister) and she knows it. (Genitive Head Deletion)

Neubauer gives these sentences as counterexamples to Sanders and Tai's claims(1969) that Ross's chopping-copying distinction cannot be maintained since chopping can be decomposed into two distinct component transformations *copying* and *deletion* and it is the latter that is sensitive to CSC. Neubauer contends that this claim is untenable since sentences in (6) with constituents in parentheses deleted are still grammatical. According to him, this phenomenon proves that some instances of deletion in the coordinate structure is insensitive to CSC and that the motivation for the chopping-copying distinction cannot be denied.

Neubauer's claim seems to be true as far as sentences in 6 are concerned, but Grosu provides with the following convincing counterexamples.

(7) a. John knows it would be dangerous for him and Mary to wash themselves with

[3] The major four of the Island Constraints are the Complex NP Constraint, the Sentential Subject Constraint, the Left Branch Condition and the Coordinate Structure Constraint. For details of the claims and the nature of the Island Constraints and for the concept of "island" see Ross (1967) and Kim(1974c).

acid.

a′. *John knows it would be dangerous (for) and Mary to wash themselves with acid. (Super-Equi)

b. I couldn't lift this rock, but I know a boy who can lift this rock and bend a crowbar too.

b′. *I couldn't lift this rock, but I know a boy who can and bend a crowbar too. (VP Deletion)

c. Somebody came in at 5 o'clock, but I have no idea who came in at 5 o'clock and left at ten.

c′. *Somebody came in at 5 o'clock, but I have no idea who and left at ten. (Sluicing)

d. I like John's mother, but I don't like Bill's mother or father.

d′. *I like John's mother, but I don't like Bill's or father. (Genitive Head Deletion)

Accoring to Grosu, the only feasible explanation of the difference between the acceptable sentences in (6) and the unacceptable ones in (7) is that the former have had only parts of the conjuncts in the coordinate structure deleted while the latter have had the whole conjuncts deleted. Thus in (6.a) Super-Equi deletes *for him* that is a constiuent of the conjunct *that it is dangerous for him to shave himself with a rusty blade*, but the whole sentence is acceptable. On the other hand, (7.a′) which results from applying the same rule to the whole conjunct *him* of *him and Mary* is unacceptable. This difference is also observable in the cases of all the other deletion transformations such as VP Deletion, Sluicing, Genitive Head Deletion, etc. as may be noted in (6.b, c, d) and (7.b′, c′, and d′) respectively. From these evidences Grosu draws the conclusion that Ross's CSC is a totally unmotivated merge of two independent phenomena which should have been treated separately.

This non-unitary nature of CSC, according to Grosu, is also true of Pronominalization rules. For example, (8.a, b) should be equally unacceptable if CSC were to constrain the application of Reflexivization to the coordinate structure in those sentences. However, (8.b) is accepted by native speakers while (8.a) is not.

(8) a. *John admires Mary and himself.

b. John admires Mary and despises himself.

In (8.b) we can see that Reflexivization has applied only to a subconstituent of the conjunct *despises himself* while in (8.a) the same rule has applied to the whole conjunct *himself* of the coordinate structcture *Mary and himself*. A second example of pronominalization rules supporting Grosu's contention is Pronominalization.

(9) a. ?*This rock is too heavy for me to pick it and the crowbar up.

b. This rock is too heavy for me to pick it up and lift the crowbar at the same time.

(10) a. ?*The knife is ready for you to use it and the fork.
b. The tea is ready for you to drink it and enjoy yourself.

The last supporting evidence for Grosu's contention is related to chopping rules. Ross, in his dissertation(1967), noted that the asymmetric coordinate structure was not constrained by his CSC. For example,

(11) a. I went to the store and bought some whiskey.
b. This is the whiskey which I went to the store and bought.
c. This is the store which I went to and bought some whiskey.

are not constrained by CSC. Grosu, however, noted that the chopping rule, Relativization in this case, has applied only to the subconstituent of the conjunct in (11.b, c.) If a chopping rule applied to the whole conjunct, however, ungrammatical sentetences would result as shown in (12.c, d) below.

(12) a. John is looking forward to going to the store and buying some whiskey.
b. What John is looking forward to is going to the store and buying some whiskey.
c. *What John is looking forward to and buying some whiskey is going to the store.
d. *What John is looking forward to going to the store and is buying some whiskey.

To summarize, Grosu noted that Ross's CSC is not unitary in nature and that only that portion of CSC that constrains the whole conjunct is effective for deletion rules, pronominalization rules, and chopping rules, etc.

3.0 Another constraint posited by Ross(1967) and discussed by Postal(1972) in relation to the coordinate structure is the coordinate condition in Ross's Pied-Piping Convention.

(13) The Pied Piping Convention(Ross 1967 : 114)

> Any transformation which is stated in such a way as to effect the reordering of some specified node NP, where this node is preceded and followed by variables in the structural index of the rule, may apply to this NP or to *any non-coordinate NP* which dominates it, *as long as there are no occurrences of any coordinate node*, nor of the node S, on the branch connecting the higher node and the specified node. (*Italics mine.*)

This constraint is posited in order to enable Relativization to generate all of the four sentences in (15) from the source sentence (14).

(14) The government prescribes the height of the lettering on the covers of the reports.

(15) a. Reports which the government prescribes the height of the lettering on the covers of are invariably boring.
b. Reports the covers of which the government prescribes the height of the lettering on almost always put me to sleep.
c. Reports the lettering on the covers of which the government prescribes the

height of are a shocking waste of public funds.

d. Reports the height of the lettering on the covers of which the government prescribes should be abolished.

What we can derive by applying the rule of Relativization without any additional stipulation such as Chomsky's A-over-A Principle or Ross's Pied-Piping Convention is only (15. a). If we have the A-over-A Principle in addition to the rule, we can now derive only (15. d), and (15. a) is constrained. Hence, Ross posits (13) (hereafter called PPC) which enables Relativization to generate all of the sentences in (15), rendering the A-over-A Principle unnecessary. The virtue of PPC is that it enables the preceding elements of the relativized NP to be optionally moved together, i.e. "pied-piped", with the relativized element.

On this pied-piping effect, however, Ross puts two conditions stipulating the cases in which such effect must be nullified. One of these conditions has direct bearing on the present discussion and I have indicated by italics the relevant phrases in (13). The effect of this condition is to prohibit pied-piping from applying to the coordinate structure as illustrated by (16).

(16) a. The boy[I met Bill and the boy] was tall.

b. *The boy who I met Bill and was tall.

c. *The boy Bill and who(m) I met was tall.

I will call this condition, for convenience, the coordinate condition on PPC.

Postal(1972) raises a question as to the validity of the coordinate condition on PPC. According to him, while this condition works all right in sentences like (16), it fails in sentences like (17).

(17) a. The manuscript the lettering on the front of which and the scribbling on the back of which Harry deciphered was in Gwambamamban.

b. The manuscript the lettering on the front of which and the scribbling on the back of which Max says Harry deciphered was in Gwambamamban.

If we were to include the coordinate condition on PPC in the grammar, (17. a,b) would have to be constrained and judged ill-formed since both of them have to be derived by pied-piping from the coordinte structure. Both of these sentences, however, are accepted by native speakers. Thus Postal argues that, if we want to keep Ross's coordinate condition on PPC and still be able to generate these sentences, a derivation like (18. a→b→c→d) has to be posited.

(18) a. the manuscript [$_S$Max says [$_S$ [$_S$Harry deciphered the lettering on the front of the manuscript]$_S$ and [$_S$Harry deciphered the scribbling on the back of the manuscript]$_S$]$_S$]$_S$ was in Gwambamamban

b. the manuscript Max says Harry decipheed the lettering on the front of which and Harry deciphered the scribbling on the back of which was in Gwambamamban

c. the manuscript Max says the lettering on the front of which Harry deciphered and the scribbling on the back of which Harry deciphered was in Gwambamamban

d. the manuscript the lettering on the front of which and the scribbling on the back of which Max says Harry deciphered was in Gwambamamban(=17. b)

That is, in order to get (18. d) from (18. a), two instances of Relativization must be applied separately followed by separate movements of the relativized elements and also separate pied-pipings. The result of such separate applications of Relativization and of pied-piping would be (18. c). Then, in order to derive (18. d) from (18. c), the rule of Coordinate Reduction has to be invoked. Postal, however, thinks that this is a very doubtful solution since it must invoke Coordinate Reduction whose status in generative theory is still a moot point. According to Postal, we will especially be in an awkward situation with a sentence like (19. a).

(19) a. Joan, the oldest sister of whom and the next door neighbor of whom make an amiable couple,.....

b. The oldest sister of Joan's and the next door neighbor of Joan's make an amiable couple.

c. *The oldest sister of Joan's make an amiable couple and the next door neighbor of Joan's make an amiable couple.

The trouble with this sentence is that the coordinate relative clause would have to be derived from (19. b) which again would have to be derived from (19. c). Positing a coordinate structure like (19.c), however, has already been convincingly argued against by Lakoff and Peters(1966).

To summarize Postal's argument against the coordinate condition on PPC, the status of this condition is very doubtful since there are unfavorable cases like (18) and (19) and since we have to invoke the doubtful Coordinate Reduction if we are to keep the condition in our grammar.

Grosu(1973b), however, argues even against Postal's remarks that the problem can be gotten around at the expense of positing Coordinate Reduction. His counterexamples are the following.

(20) a. The manuscript [$_s$the lettering on the front of the manuscript surprised Harry and the scribbling on the back of the book surprised Harry]$_s$ was in Gwambamamban.

b. *The manuscript the lettering on the front of which and the scribbling on the back of the book surprised Harry was in Gwambamamban.

Sentence (20. b) can be derived from (20. a) by relativizing *the manuscript*. This sentence is different from all the other examples given by Ross and Postal in that it does not involve movement and pied-piping. It cannot, therefore, be constrained either by Ross's coordinate condition on PPC or by Postal's "unsatisfactory" solution by separate appli-

cations of movement and pied-piping followed by Coordinate Reduction. Another example which Grosu presents against the coordinate condition on PPC is (21).

(21) a. Who$_i$ visited Paris, and who$_i$ visited which other city?
b. *Who visited Paris and which other city?

In case the two *who*'s in (21.a) are identical in reference, Coordinate Reduction must be allowed to apply and the result of such application would be (21.b), which is unacceptable contrary to our expectation. Note, however, that (22) is acceptable.

(22) The manuscript such that the lettering on its front and the scribbling on the back of the book surprised Harry was in Gwambamamban.

Grosu notes that the only difference between (20.b) and (22) is that the former has WH-feature in the coordinate structure while the latter does not. He concludes from this observation that sentences like (20.b) can be constrained if we accept Ross's contention that feature changing rules are sensitive to the island constraints, CSC being one of them, and if we treat Question Formation and Relativization as feature changing rules. In other words, as we already have CSC which would constrain Question Formation and Relativization applying to the coordinate structure, an additional stipulation like the coordinate condition on PPC would not be necessary.

One major difficulty with Grosu's proposal as the present writer sees, however, is that, while his observation that Postal's proposal doesn't work in cases like (20) is true, neither does his own proposal solve the problem raised by Postal's sentences (17) and (18). In sentences (17.a, b), relativization of any one of the two NP's in each coordinate structure would be constrained according to Grosu's proposal since Relativization, now a feature changing rule, would simply be constrained by CSC. Contrary to such a prediction, those two sentences are acceptable. Therefore, the phenomenon in which relativization of both of the constituents of the coordinate structure is acceptable to the native speakers fails Grosu's theory as well as it did Postal's. In section 6 below, I will explain how this difficulty can be overcome by my proposal to be made there.

4.0 In Sections 1 to 3, we have surveyed a trend of the study of the coordinate structure in terms of possible constraints on movement transformations. Now, discussion of the study in terms of conditions on constituting the coordinate structure is in order. As far as the present writer is aware of the trend, the forerunner of transformational study in this trend is Chomsky(1957) in which he puts forward the following observations on the transformational derivation of the coordinate structure.

The gist of Chomsky's observations is that if we have two sentences Z-X-W and Z-Y-W, and if X and Y are actually constituents of these sentences, we can generally form a new sentence Z-X-*and*-Y-W. (Chomsky 1957 : 35-37).

(23) a. the scene—of the movie—was in Chicago
b. the scene—of the play—was in Chicago

(24) the scene—of the movie and of the play—was in Chicago

In (23,) *of the movie* and *of the play* are constituents of the two sentences respectively, and hence the process of conjunction produces (24). What should be noted here is the condition that if the strings to be coordinated by this process are not constituents of the sentences to be conjoined, the result of the process is unacceptable as shown by the following examples given by Chomsky.

(25) a. the—liner sailed down the—river
b. the—tugboat chugged up the—river

(26) *the—liner sailed down the and tugboat chugged up the—river

However, Chomsky observes also that this condition that requires the conjuncts to be constituents of the component sentences is not sufficient for the process of conjunction to work right. He gives the following for illustration.

(27) a. the scene—of the movie—was in Chicago
b. the scene—that I wrote—was in Chicago

(28) *the scene—of the movie and that I wrote—was in Chicago

Here we can see that coordination of constituents does not necessarily give an acceptable sentence. Thus Chomsky draws the following conclusion from these observations(Chomsky 1957 : 36).

(29) If S_1 an S_2 are grammatical sentences, and S_1 differs from S_2 only in that X appears in S_1 where Y appears in S_2(i.e., S_1=.....X.....and S_2=.....Y.....), and X and Y are *constituents of the same type*(*italics mine*) in S_1 and S_2 respectively, then S_3 is a sentence, where S_3 is the result of replacing X by X-and-Y in S_1 (i.e., S_3=.....X-and-Y.....).

For the convenience of our discussion, the three conditions posited by (29) may be rephrased separately as given in (30).

(30) a. The remainders of the two sentences of which two constituents are to be conjoined must be identical strings.
b. The two strings to be conjoined must be constituents of the two component sentences.
c. The constituents to be conjoined must, in addition, be of the same type.

While the first two of these conditions seem to be clear enough, the last of them, (31. c) seems to be very obscure. Thus, we are not able to judge exactly what is meant by the phrase "of the same type." As the criteria for deciding whether two constituents are of the same type or not, we can either employ the category names of a system of the phrase structure rules of a grammar or devise some semantic criteria. However, a little scrutiny of examples of coordinate sentences immediately shows us that one-sided adoption of either of the categorial and semantic criteria causes difficulties. Also, we can easily find examples which show us that even in the same set of semantic or categorial criteria, the level of hierarchy at which such set of criteria must be employed cannot definitely be defined. That is, according to the types of imbalance that causes unaccepta-

bility of a coordinate structure, the degree of acceptability seems to fluctuate with regard to the level of categorial or semantic hierarchy in the coordinate structure.

5.0 A number of articles written by linguists after Chomsky's first attempt to take account of coordination transformationally give us some explanations or implications as to what the nature of "constituent of the same type" is. Among these are Smith(1969), Gleitman(1965), Lakoff-Peters(1966), etc. In the discussion below, I will freely draw from their examples and observations and try to account for what are really involved in the phrase "constituents of the same type."

First of all, it seems obvious that the nature of "constituents of the same type" involves the categorial notion as is evident in (28). For *of the movie* is a PP whereas *that I wrote* is an S embedded in the higher NP. However, look at the following examples.

(31) a. John saw Jim and John saw himself.

b. ?John saw Jim and himself.

Jim and *himself* are both sub-elements of conjuncts in (31.a) while the same strings in (31.b) are conjuncts themslves at the higher level in the coordinate structure. The comparatively low acceptability of (31.b) seems to support the conclusion that this constituent pair is imbalanced in that *Jim* is a pronoun while *himself* is a reflexive pronoun. But the problem here is that they are both NP's at a higher level of description and this fact causes difficulty as to what level of categorial description should be judged to be critical. The acceptance of the same sentence (31.b) by a small number of people seems to make the difficulty even worse. It seems, however, evident at least that the coordinate structure becomes more acceptable as the categorial imbalance is at a lower level down the coordinate node and also as the categorial imbalance is of the nature of the lower level in the subcategorization hierarchy. In these respects, the degree of imbalance and its judgment by the native speakers seem to be very "squishy" in the sense of Ross (1973, 1974, 1975).

Second, imbalance in specificity seems to be unacceptable even if it is at a lower level of the coordinate structure. Relevant examples are (32) and (33).

(32) a. The queen saw the man and the king saw him.

b. *The queen saw the man and the king saw one.

(33) *I saw the painting and a painting.

Here it is difficult to judge whether this is a categorial imbalance or a semantic one. But the writer would like to vote for the semantic side here since (33) seems to improve if we have a relative clause attatched to *a painting* as in (34).

(34) ?I saw the painting and a painting that was nailed on the wall.[4]

Furthermore, (34) becomes wholy acceptable if we substitute *another* for *a* in it. This

[4] This sentence was given by Kee Dong Lee as a counterexample to my argument for the imbalance in specificity contributing toward less acceptability of a sentence.

case cannot be accounted for simply by categorial imbalance since the two constituents have categorially different articles *the* and *a/another* though the sentence is acceptable. A possible explanation here is that the specificity imbalance between the two constituents involved has been reduced considerably by the relative clause *that was nailed on the wall*, which is a semantic explanation.

Thirdly, two conjuncts in the coordinate structure in some cases must have parallel construction. For example, (35) is perfectly acceptable while (36) is not.

(35) I gave the boy a nickel and the girl a dime.

(36) ??I gave the boy a nickel and a dime to the girl.

This imbalance is not in the least likely to be either categorial or semantic. It seems to be purely structural since it is due to the different configurations in the trees.

Fourth, imbalance may be caused by one of the two constituents being "complete" and the other "incomplete." This notion of completeness is very elusive but the following example may suffice.

(37) *The tall man and short woman walked away.

This sentence has a complete constituent *the tall man* and an incomplete one *short woman*. The latter consituent is "incomplete" with respect to the former in that it is not exhaustively dominated by the NP *and* lacks the determiner whereas the former constituent does not. This may also be a case of categorial imbalance since what are conjoined here, if we exclude the two adjectives in the constituents, are an NP *the man* and an N *woman*.

The fifth and last examples show a semantic or rather logical constraint on coordination.

(38) a. I saw this painting and that painting.

b. I saw this painting and this painting.

c. *I saw the painting and the painting.

(38. a, b) show that two constituents to be conjoined must have different references. This becomes more evident when we consider the fact that (38. b) is acceptable if only it is uttered with contrastive stresses on the two *this*'s usually accompanied by manual acts of pointing to or indicated by throwing glances at the two different paintings. Otherwise, this sentence is structurally impossible to indicate the referential difference involved, and hence unacceptable.

One more condition which I would add to the five examples given above is that a null string cannot be conjoined to a non-null string. This condition looks so obvious that it seems hardly necessary to add it to the grammar, for no grammar would naturally do so. I contend, however, that this condition is essential for a coherent and systematic account of coordination. Further, I contend that the lack of this very condition misled a number of linguists to try their researches in the second trend in terms of contraints on movement transformations applying to the coordinate structure. Perhaps,

sentences (39) which are supporting evidences for the writer's contention is too obvious.

(39) a. *I saw this painting and.
b. *I saw and that painting.

What has been discussed so far may be summarized as in (40).

(40) Summary of the conditions on coordination.

i. The conjuncts to be conjoined must be constituents of the component sentences. (See: 23-26)
ii. The conjuncts must have parallel structural configurations in some cases. (The specifications of these cases need more study.) (See: 35-36)
iii. One of the conjuncts must not be incomplete with respect to the other. (See: 37)
iv. Conjoining of two constituents of the same category is the optimal choice in coordination. However, if the two conjuncts are of different types of category, the resulting coordinate structure is more acceptable (a) if the categorial difference is one of the lower level of subcategorization hierarchy, and (b) if the categorial difference is at a lower level in the structural configuration. (See: 31)
v. Two constituents to be conjoined must be in the same value of + or − with respect to some features. Some such features are [specific], [WH], etc. (See: 32-34)
vi. The conjuncts must not have an identical reference. (See: 38)
vii. Neither of the two conjuncts can be a null string. (See: 39)

6.0 The list of conditions on coordination as summarized in (40) is very revealing in that there seems to be one predominant principle underlying all those superficially distinct conditions except for the nonidentity condition (40. vi). The principle is that coordination is incompatible with "imbalance" in the two conjuncts. Among the seven conditions in (40), (i), (ii) and (iii) manifest structural imbalance. (iv) involves categorial imbalance, which is however structural in a broader sense of the term "structure". After all, categories are the primes or elements of structure configurations and they are one of the factors that make possible the concept of structure. Conditions (v), (vi) and (vii) all involve semantic considerations. Two of them, namely (v) and (vii), manifest a constraint on semantic imbalance while condition (vii), which is the only exception to imbalance, involves so much balance that it attains identity. It seems quite natural that coordination is incompatible with conjoining referentially identical constituents since it provides with unnecessary repetition of the same entity. It is a very interesting fact that this should logiclly have to be so even though coordination requires a balance in the conjuncts involved.

From these observations, the writer would like to advance the following principles for the coordinate structure of English. This set of principles are highly tentative and even speculative to some extent. However, it seems to capture highly plausible principles governing English coordination even with hazy borders to be excavated further.

(41) The Principles of Balance for the English Coordinate Structure.

i. The conjuncts in the coordinate structure must be balanced both structurally and semantically.

ii. Semantic identity in the conjuncts is incompatible with coordination.

iii. If there is such imbalance in a coordinate construction, the construction is more acceptable

a. if the difference is one of the lower level of subcategorization hierarchy, and

b. if the difference is at a lower level in the structural configuration.

These principles that require conjuncts to be *not identical but balanced* seems to be the basic factor that underlies the phenomena which linguists such as Ross, Grosu, and Postal attempted to take account of in terms of constraints on transformations as well as the phenomena which linguists such as Chomsky, Gleitman, Smith, etc. tried to in terms of conditions on coordinate constituents. In other words, the two trends of research on coordination mentioned at the outset of this paper have only been trying to capture one of the two sides of a coin as if they were two different things. The set of conditions on coordination (40) is necessary in any way for description of constitutory processes of the coordinate structure. On the other hand, Ross's CSC and Grosu's and Postal's modifications seem to be capturing only the cases of transformational violation of these conditions. What then is the necessity of having those two sets of descriptions in one and the same grammar?

Now, it seems to the present writer that the description in the second trend as interpreted in (40) contains, in principle, the description in the first trend. In addition, the set of conditions in (40) has a wider range of coverage of the phenomena related to the coordinate structure. One problem, however, is that (40) is a set of conditions to be utilized mainly in generating the phrase structures and that we need a subset of the same set of conditions in constraining transformations from deriving unacceptable sentences violating such a set of conditions. Here, one very highly systematic and plausible solution to this problem is to set up a convention like (42) in the grammar instead of positing the CSC or some similar constraints on coordination.

(42) The Reflexive Effect Convention.

If the result of application of any transformation is in violation of any of the conditions on coordination (40), then it is ill-formed to the degree that such an application violates them.

We should note here that this convention achieves a very natural generalization since it seems more than natural that a sentence should be judged unacceptable if it has been derived by way of a process which is in violation of the conditions that have been imposed on the sentence in the process of constituting it. Otherwise, the two processes of constituting the coordinate structure in the sentence and transforming it into a derived structure would have to be contradictory in respect to the conditions on coordination.

7.0 It is in order now to show how the writer's proposals (40) and (41) work in conjunc-

tion with the Reflexive Effect Convention (42) for all the cases discussed in Sections 1, 2 and 3. Those discussed in Sections 4 and 5 need not be discussed here again since the conditions on coordination (40) and the Principles of Balance (41) have been based on the observations in them. To start with Ross's examples (2) and (3), they are both violation of (40. vii). It is very interesting further to note Neubauer's examples (6) and Crosu's (7) and (11). The unacceptable sentences in (7) are, without exception, cases of deletion of the whole conjuncts as Grosu noted. In this respect my proposal does not override Grosu's description. However, his description does not explain why deletion of a whole conjunct is unacceptable while deletion of a sub-element of a conjunct is acceptable. According to my proposals, i.e. (40. vii) and (41), this is self-evident. Deleting a whole conjunct would result in a "coordinate" construction which has only one conjunct plus the conjunction *and* or *or* which is not only bizarre but nonsensical, for the function of a conjunction is to conjoin at least two elements and it seems almost a self-truism to me that a string with only one conjunct would have to be rejected. At least (40. vii) captures this intuitive fact. According to Grosu, examples of asymmetric structure (11) given by Ross is accepted not because they are asymmetric but because the chopping rule effected only part of the conjuncts involved. This observation is also neatly taken account of in terms of (40. vii) all in the same manner as in preceding examples.

Grosu's cases of Pronominalization rules, (8) (9) and (10) can be explained by (40. iv). The examples of sentences here are the same in that they have categorial imbalance in their coordinate constructions, but the acceptable ones and unacceptable or doubtful ones are different in that the former have the imbalance at the lower level of the coordinate configurations while the latter have it at the uppermost level of them.

In order to see how (40) explains the cases of the coordinate condition on PPC, we had better see Postal's and Grosu's counterexamples to Ross's argument. First, Postal's counterexamples pose no problem to our solution since we have proposed to get rid of Ross's CSC. That is, examples (17) and (18) are quite acceptable sentences which are not to be constrained by any one of the conditions on coordination in (40). Also, according to our solution, the problem of Conjuntion Reduction as illustrated by (19) would not arise since we do not posit a derivation like (18) and hence do not have to resort to the rule. But then, the problem would be how we could take account of Grosu's case (20. b) and this is where (40. iv) is called for. A feature changing rule like Relativization makes the resultant string a relative clause and consequently (20. b) involves a categorial imbalance. Or, to speak in much stricter formal terms, the tree configuration of (20. b) involves obligatory application of Relativization for both of the conjuncts but the sentence has resulted from neglecting one of the two required applications of the rule. This sentence is also in violation of (40. v) even though the imbalance is at a relatively low level of the coordinate structure. This condition (40. v) can also solve Grosu's case (21. b). While the conjuncts *who visited Paris* and *who visited which other city* in (21. a) are balanced

with respect to both the category and the feature WH, the conjuncts *Paris* and *which other city* in (21. b) are imbalanced with respect to the same feature, hence (21. b) is in violation of (40. v). Though my solution here is consonant with Grosu's contention in that mine also hinges upon the existence of the WH feature, it is different from his in that it does not employ Ross's CSC to work in conjunction with it.

Finally, sentences in (16) are the only examples that we have not yet seen how the writer's proposals would take account of. (16. b, c), I contend, violates conditions (40). The first of the violations is with respect to (40. iv, v). I take the view that Relativization must be regarded not as a unitary transformation but as a composite processes of Relative Formation(retaining only WH Feature Changing operation), Copying and Trace Deletion.[5] In order to derive (16. b), for example, a derivation like (43) would be needed.

(43) a. The boy $[_s$I met Bill and the boy$]_s$ was tall. —Relat. Formation→
b. The boy $[_s$I met Bill and who$]_s$ was tall. —Copying→
c. The boy $[_s$who I met Bill and who$]_s$ was tall. —Trace Deletion→
d. *The boy who I met Bill and was tall.

What I am claiming here is that the derivation of (43. d) violates (40. iv, v) at the stage of deriving (43. b) by Relative Formation and again violates (40. vii) at the stage of deleting the second *who* in (43. c) by Trace Deletion in order to get (43. d). Also, the same line of explanation is good for (16.c).

The strongest argument that Ross presents for regarding Relativization as a movement rule is due to examples like (44).

(44) a. The boy $[_s$the boy and the girl embraced$]_s$ is my neighbor.
b. *The boy who and the girl embraced is my neighbor.

As he already has CSC to constrain moving a conjunct out of a coordinate structure, Relativization can most conveniently be regarded as a movement rule in order for (44. b) to be constrained by CSC. However, as far as the base string of (44.a) and that of the derived sentence (44. b) are concerned, there is actually no sign of movement at all. Hence, Ross argues that this is a case of vacuous application of the movement rule of Relativization, the only effect of which is to Chomsky-adjoin the relativized *who* to the remaining phrase *and the girl embraced.* As Ross's CSC is no longer necessary according to my proposal, there is no need now to assume the case of such vacuous application. This case can very easily be solved by (40. iv, v) since the two conjucts *who* and *the girl* are imbalanced with respect to both their categories and the WH feature. Thus we can eliminate Ross's very artificial argument for the vacuous application of Relativization.

To Summarize my argument, Ross's assumptions pose two problems: namely first, his

[5] To my knowlege, the first serious proposal for decomposition of the conventional rule of Relativization was made by Perlmutter(1968). I owe to Susumu Kuno for drawing my attention to this article. Details of my analysis, however, is different from Perlmutter's in that I posit Trace Deletion instead of his Shadow Deletion. For details, see Kim(1974a, 1974c).

CSC does not satisfactorily account for the case of coordnation of two relativized clauses as observed by Postal (see 17) and second, his view of Relativization as a movement rule is too artificial in cases like (44) and, in addition, such a view fails, even at the expense of artificiality, in Grosu's cases like (20). Here the trouble with his proposals is that, even if we allow the vacuous application of Relativization to *the manuscript*, we would further need obligatory application of PPC which is supposed to be optional and, in addition, we would also need to apply PPC only to the highest node. This is simply paying too much, complicating the description and losing generalization.

As a solution to the first problem, the writer has proposed a tentative list of conditions on coordination (40) which are needed any way for constituting the coordinate structure and have also proposed the Reflexive Condition. As a consequence of these proposals, the problem can be solved without recourse to Ross's CSC. As to the second problem, it can be given a very clear solution if we view the conventional rule of Relativization as decomposed into a series of three distinct processes, namely Relative Formation, Copying, and Trace Deletion.[6] Benefits of this view is that it can also contribute to eliminating Ross's CSC which has been proved to be unnecessary for the first case and, in addition, to eliminating Ross's artificial concept of vacuous application of Relativization.

8.0 In conclusion, I would like to make a few comments by way of relating my present proposals with respect to other proposals of mine as previously made in Kim (1973, 1974a, 1974b, 1974c). In these works, I have proposed an assumption to the effect that the structure of a language exerts resistance to changes by transformations. I call this "structural resistance to transformations." I also assume that such structural resistance succumbs to changes by transformations only when there are some strategies available for recovery of the original structure. As a tentative formulation of the structural resistance, I have proposed the Domination Shift Constraint which prohibits moving an element of a major category(for example, Adv.P, Adj.P, NP, or S) out of its respective dominating category. As some outstanding cases of recovery strategies which help make exceptions to the Domination Shift Constraint, I have proposed two Release Conditions, one of which allows movement rules to apply when the element affected is the object of a transitive word and the other of which does so when the element to be moved has an identity to its constituent-mate.[7] As the third of the major strategies

[6] According to my proposal, English relative clauses are generated by three different derivations:(1) a derivation in which only Relative Formation(as conceived as the WH feature changing rule) is applied as in subject relativization: *the man who is reading a book is my uncle*, (2) a second case in which Relative Formation and Copying are applied as in: *the teacher who that the principal would fire her was expected by the reporters was not fired* (this sentence is used by a limited number of speakers, and it involves Pronominalization), and (3) a third case in which all of the three rules, Relative Formation, Copying, and Trace Deletion, are applied as in: *yesterday I met the man who you said you had met.*

[7] I define the term "constituent-mate" as the following: if a set of two constituents is exhaus-

for recovery of the original structure, I have proposed the Constraint on the Range of Movement which stipulates that an element to be moved out of a constituent must be moved only to the position which commands its place of origin. This constraint is also a very feasible strategy for guaranteeing recovery of the original structure.

It is very encouraging to note that the conditions on coordination and the Reflexive Effect Convention proposed in this article are also consonant with my said assumption of strutctural resistance. The principles on which the coordinate structure is constituted must exert resistance to transformations if the structural resistance principle is to be valid in all aspects of linguistic structure, and it seems obvious that the Reflexive Effect Convention works toward constraining transformational processes in case the recovery of the original structure is not possible. What is meant here is that, as the coordinate structure does not have any strategy of the sort I have discussed above built in it, the structural resistance of the coordinate structure may not be waived since otherwise the recovery of the original structure would be impossible.

One very interesting aspect of this principle to be pursued further would be how it is related to the phenomena observed by Emonds(1970). He classified tranformations into two categories, one category of rules preserving the constituent structure and the other category radically changing the structure. In the light of my proposal of structural resistance, it seems most likely to turn out that Emonds' category of root transformations would with benefit be distinguished between a subtype of root transformations which are the Release Condition cases according to my proposals and another subtype of cases which are not such. Significance of study in this direction remains to be explored in the future.

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tively and directly dominated by one and the same NP and if one of them is an NP and the other is an S, then they are the constituent-mate of each other. e.g. *the fact/that she came early; the man/who came here yesterday,* etc. (Kim 1974a)

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