On Reduced Juxtaposition in Japanese *

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Abstract

Reduced juxtaposition is a construction in Japanese that is somewhat similar to non-constituent coordination in English. Syntactic and semantic rules are proposed for dealing with this ellipsis within a phrase-structure-based approach to natural language grammar description.

1 Introduction

In this paper, we will address the following questions: How is reduced juxtaposition in Japanese as exemplified by the sentence in (1) to be incorporated into a declarative description of Japanese grammar? Is such a description compatible with a phrase-structure-based account of Japanese syntax and semantics?[1] What are the restrictions on application of such an elliptical process, if any?[2]

(1) Taro-wa Hanako-no, Ziro-wa Megumi-no,
Taro-SBJ Hanako-POSS Ziro-SBJ Megumi-POSS
otosan-o tazuneta.
father-OBJ visited

Juxtaposition here is intended to mean those constructions in Japanese that are more or less like coordinately conjoined constructions in English but lack overt conjunctions that conjoin the two 'conjuncts' of the sentence.

In the sentence in (1), we see ellipsis of redundant elements in juxtaposition. The sentence in (2), in which the repetition is retained, means more or less the same thing. In spite of the redundancy, the sentence in (2) is quite natural on its own.

(2) Taro-wa Hanako-no otosan-o tazune,
Taro-SBJ Hanako-POSS father-OBJ visited
Ziro-wa Megumi-no otosan-o tazuneta.
Ziro-SBJ Megumi-POSS father-OBJ visited

Now the problem we see in (1) is that we have elements that do not form constituents in the usual sense. Let us suppose here, for the sake of exposition, that the sentence in (1) is divided into three major parts as shown in (3). Let us call these three parts, for the sake of easier reference, 'the left remnant', 'the right remnant', and 'the right periphery', respectively.

(3) a. Taro-wa Hanako-no [the left remnant]
b. Ziro-wa Megumi-no [the right remnant]
c. otosan-o tazuneta [the right periphery]

None of the three major elements in (2) as listed in (3) can be thought of as forming a constituent in the construction under consideration. Specifically, the left remnant *Taro-wa Hanako-no* and the right remnant *Ziro-wa Megumi-no* obviously are not well-formed constituents in the usual sense, although these could be thought of as slashed categories in GPSG-like frameworks.[3]

At first glance, the right periphery *otosan-o tazuneta* might seem to form a natural constituent, but bear in mind that an adnominal *no*-marked postposition exists in both *Taro-wa Hanako-no* and *Ziro-wa Megumi-no*. If we suppose that an adnominal *no*-marked postpositional phrase and a noun phrase form a greater noun phrase, then ellipsis involved here is operating in such a way that it 'chops' in between this greater noun phrase. Thus we

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[1]For a general exposition of grammatical frameworks for declarative natural language descriptions, such as GPSG, HPSG and JPSG, see [5], [12] and [6], respectively. In this article, we will follow notational conventions for describing feature specifications and constraints holding among them employed in JPSG as described in [8] and [10].

[2]Symbols such as SBJ, OBJ, IOB, POSS, TOP, ADN, COMP and CONJ would hopefully be self-explanatory, but they are shorthand for 'subject', 'object', 'indirect object', 'possessive', 'topic', 'adnominal', 'complementizer' and 'conjunction', respectively. However, they are merely meant to be ***suggestive*** of the semantic content of the postpositional phrases of the Japanese sentences involved. No commitment is to be assumed here for the exact semantic nature, such as thematic roles within the given sentences, of the postpositional phrases in question. Note, incidentally, that *wa*-marked postpositional phrases are often marked with 'SBJ' in the gloss in this paper.

[3]It might be argued that the sentence could be analyzed merely by postulating some right-node-raising like ellipsis that operates inside a noun phrase or a postpositional phrase, but the examples in (i) and (ii) are not acceptable in the intended sense.

(i) Taro-no to Ziro-no otosan(-ga)
(ii) Taro-no, Ziro-no otosan(-ga)

see that none of the three major elements listed in (3) can be thought to form a constituent here.

2 Juxtaposition in Japanese

A number of basic questions have to be addressed, however briefly, before we can properly start our discussions on 'reduced juxtaposition' in Japanese. For instance, we'd have to ask ourselves whether 'juxtaposition' really is a distinct phrase structure from complementation or adjunction, and we'd have to make clear how we should treat the syntax and semantics of 'juxtaposition', and so on.

2.1 Coordination in Japanese

In Japanese, we find sentences that seem more or less like coordinately conjoined constructions in English. Sentences in (4), (5) and (6) would seem at first glance to be nicely explained by postulating a phrase structure rule for coordination in Japanese.

(4) Taro-to Hanako-ga kita.
Taro-CONJ Hanako-SBJ came

(5) Taro-to Hanako-ga kekkon-sita.
Taro-CONJ Hanako-SBJ got-married

(6) Taro-wa terebi-o mi-te razio-o
Taro-SBJ television-OBJ watch-CONJ radio-OBJ
kii-ta.
listened

However, a moment's reflection tells us that there are alternative accounts that are at least as plausible as the one involving coordination. For instance, in the case of (4), we might assume that *Taro-to* functions as an 'adjunct' to *Hanako* or *Hanako-ga*, where *to* is the 'head' of the postpositional phrase and *Taro* is the 'complement' of the postposition. In the case of (5), *Taro-to* might be treated as a complement to the verb *kekkon-suru* and in (6), *terebi-o mi-te* could simply be thought to be subordinate clause functioning as a sentential modifier. Of course, these suggestions themselves are not sufficient to establish that the sentences above cannot be treated by postulating something like coordination in Japanese.

The following examples, however, seem to suggest that the *to*-marked postpositional phrase in (4) could be treated as an adjunct to the verb *kita* and the *to*-marked postpositional phrase in (5) should better be treated as a complement to the main verb *kekkon-suru*.[4]

(7) Hanako-ga Taro-to kita.
Hanako-SBJ Taro-CONJ came

(8) Hanako-ga Taro-to kekkon-sita.
Hanako-SBJ Taro-CONJ got-married

Also, the following examples seem to suggest that the construction in (6) is not coordination.[5]

(9) Ken-wa Naomi-ni hurui
Ken-SBJ Naomi-IOB old
kutu-o sute-te atarasii kutu-o
shoes-OBJ throw-away-CONJ new shoes-OBJ
kawaseta.
make-buy-past

(10) *?[Ken-ga Naomi-ni sute-te atarasii
Ken-SBJ Naomi-IOB throw-away-CONJ new
kutu-o kawaseta] hurui kutu
shoes-OBJ make-buy-past] old shoes

(11) [Ken-ga Naomi-ni hurui kutu-o
Ken-SBJ Naomi-IOB old shoes-OBJ
sute-te kawaseta] atarasii kutu
throw-away-CONJ make-buy-past new shoes

If the construction involving *te* is really a coordinate structure, examples in (10) and (11) would presumably be a violation of coordinate structure constraint. However, the latter is acceptable while the former is arguably not. Therefore, the construction in question should be regarded as adjunction rather than coordination.

While we may be on the right track here, the conclusion should not be drawn too quickly, because we do not no why the sentence in (10) is unacceptable. Although it has sometimes been suggested that extraction from a subordinate clause is disallowed in Japanese, this is really not true.[6]

For instance, the sentence in (13) is not so bad, although it is not as good as the sentence in (14). Also, the sentence in (15) seems quite fine.

(12) Taro-wa kono-eiga-o mi-te kansobun-o
Taro-SBJ this-film-OBJ see-CONJ essay-OBJ
kaita
wrote

(13) ?[Taro-ga mi-te kansobun-o kaita] eiga
Taro-SBJ see-CONJ essay-OBJ wrote film

(14) [Taro-wa kono-eiga-o mi-te kaita] kansobun
Taro-SBJ this-film-OBJ see-CONJ wrote essay

(15) [Taro-ga kino mi-te kansobun-o kaita
Taro-SBJ yesterday see-CONJ essay-OBJ wrote
eiga
film

A fuller discussion of these alternative approaches will take us too far afield. However, we have to note that alternative approaches are open for accounting for these sentences that look quite like English coordination.

[4]There seem to be a whole lot of lexical ambiguities about the use and meaning of *to* here, about which we cannot go into any further in this paper. Thus, none of the examples discussed here should thought to give conclusive evidence of how the *to*-marked postpositional phrases in question should be treated in a proper description of Japanese grammar.

[5]The examples cited here are partly due to Isozaki (personal communication).

[6]See [9] for some further discussion on this point.

2.2 Juxtaposition in Japanese

There seems to be relatively clear cases of Japanese sentences where we have to postulate something very much like coordination in English. One is where exactly the same words (or markers) modulo some phonetic variations are used to list multiple elements that have the same syntactic property in a given sentence.[7]

(16) Taro-mo Hanako-mo kita.
Taro-CONJ Hanako-CONJ came

(17) Taro-mo Hanako-mo konakatta.
Taro-CONJ Hanako-CONJ did-not-come

(18) Taro-wa terebi-o mi-tari razio-o
Taro-SBJ television-OBJ watch-CONJ radio-OBJ
kii-tari suru.
listen-CONJ do

(19) Taro-wa syhosetu-o yon-dari kai-tari suru.
Taro-SBJ fiction-OBJ read-CONJ write-CONJ do

We also find cases where overt 'conjunctions' are lacking, and in these cases, it would be rather difficult to give alternative accounts based solely on complementation and/or adjunction.

(20) Taro, Hanako, Megumi-ga kita.
Taro Hanako Megumi-SBJ came

(21) Taro-wa terebi-o mi, razio-o kiki,
Taro-SBJ television-OBJ see radio-OBJ listen-to
hon-o yonda.
book-OBJ read

(22) Dansei-ga san-nin, zyosei-ga hutari,
male-SBJ three-person female-SBJ two-person
atumatta.
got-together

It is these cases, with possible reduction or ellipsis of redundant elements among conjuncts, that we are concerned with here. Since we do not have overt 'conjunctions' that conjoin the conjuncts involved, we will call these constructions in Japanese by the term 'juxtaposition'.

3 Coordination in English

Before we go into the discussion of how reduced juxtaposition should be treated in a declarative description of Japanese grammar, let's see how coordination including that of non-constituents are dealt with in phrase-structure-based accounts of English grammar.

[7] In these cases, too, since there are overt 'conjunctions', alternative descriptions presupposing only complementation and adjunction are conceivable.

3.1 Coordination of like categories in English

In the case of English, it might seem that there is little room for arguments against the position that there are coordination of nouns, noun phrases, verbs, verb phrases, prepositional phrases and so on, along with coordination of sentences.

(23) a. John and Mary hated Susan.
b. John hated Mary and loved Susan.
c. John hated Mary and Susan loved Peter.

However, in classical transformational analyses of English syntax, it has often been claimed that coordination of only S is allowed as part of phrase structure rules in the base component of grammar that are invoked for making up deep structures of sentences. Any other types of coordination were to be derived through a transformational operation called Conjunction Reduction such as the one proposed by Chomsky. (See p.36 in [1].)

(24) Conjunction Reduction
If S1 and S2 are grammatical sentences, and S1 differs from S2 only in that X appears in S1 where Y appears in S2 (i.e., S1 = ... X ... and S2 = ... Y ...), and X and Y are constituents of the same type in S1 and S2, respectively, then S3 is a sentence, where S3 is the result of replacing X by X + and + Y in S1 (i.e., S3 = ... X + and + Y ...).

An extreme view of this kind held that the sentence in (25, a) is derived from (25, b) or that the sentence in (26, a) is derived from (26, b), through a rather wild application of their version of Conjunction Reduction.

(25) a. John and Mary hated each other.
b. John hated Mary and Mary hated John.

(26) a. Two boys came to school.
b. One boy came to school and another boy came to school.

Putting these rather fantastic conceptualizations aside, Conjunction Reduction by Chomsky that we cited in (24) clearly was formulated in such a way that the sentence in (27, b) is to be derived from (27, a) and the sentence in (27, d) is to be derived from (27, c).[8]

(27) a. John hated Susan and Mary hated Susan.
b. John and Mary hated Susan.
c. John loved Mary and John hated Susan.
d. John loved Mary and hated Susan.

[8] If we assume natural stress patterns, the meaning of (a) or (c) is rather different from that of (b) or (d). However, transformations in transformational grammars are relations among two structural descriptions or representations of sentences and not a relation between two 'surface' sentences. If Conjunction Reduction is to be formulated as a transformational operation, it did not constitute a problem that 'sentences' in (a) and (b), or (c) and (d) would have slightly different interpretations, respectively.

In retrospect, we can see that there were three articulated and unarticulated motivations behind these treatments of non-sentential coordination within transformational approaches to syntax.[9]

First, since classical transformational grammar dealt with clause-internal dependencies such as equi, raising, passivization and so on by transformations, Conjunction Reduction had to be postulated in order to account for the following sort of sentences.

(28) a. John loves Mary and is loved by Jane.
b. John tried to kill Mary and was killed by Susan.

In a phrase-structure-based account of English, these clause-internal dependencies are dealt with by lexical rules in the lexicon. Therefore, these sentences simply involve coordination of VPs; thus no need for Conjunction Reduction. However, in a transformational analysis of English syntax, there would be no VP that correspond to the passive conjunct at the level of deep structure. Therefore, coordination of VP at the level of deep structure by a phrase structure rule does not help in accounting for these sentences. Thus, Conjunction Reduction becomes necessary that applies later than passivization and other transformations that deal with these kinds of clause-internal dependencies.

Second, in early transformational grammars, rule schemata were not fully utilized and it has sometimes been argued that having one rule for coordination for each syntactic category is redundant and less desirable than having one rule for sentence coordination and another transformational rule for Conjunction Reduction. In more recent versions of transformational grammars, however, especially after the introduction of x-bar convention, rule schemata are more readily utilized and coordination of NPs, VPs and so on has been proposed even in transformational frameworks, although some version of Conjunction Reduction had to be assumed to account for cases discussed in the previous paragraph.

Last but not the most understood problem with transformational account of coordination is that semantic representation for coordination of non-sentential categories were not very well treated. One could almost argue that the worst thing about transformational account of non-sentential coordination was the lack of explicit formulation of the semantics of these constructions. As long as we stick to the coordination of sentences, however, things do not become so messy, and this was one of the reasons that only coordination of sentences was thought to be a valid candidate for a phrase structure rule in the base component of transformational grammar.[10]

Gazdar gave a very impressive account of semantics for non-sentential coordination in a Montagovian approach to English syntax in [3]. As long as we take some sort of logical expressions as 'semantic representations' of linguistic expressions, therefore, this does not pose a very serious problem for phrase-structure-based description of syntax and semantic of English coordination.[11]

All in all, something along the line in (29) is all we want in a phrase-structure-grammar account of coordination in English.

(29) M → M1 M2 where M1 = M2 = M

A problem with (29) is that we do not really want the two conjuncts to really unify in every feature specification that it takes. Especially, we have to give a rather explicit statement on how terminal symbols such as *and* or *or* are to be distributed. Also, if we encode information regarding linguistic expressions such as spellings or phonological representations and semantics of the expressions involved as part of the feature system, the way we do in JPSG, we can only get rather trivial and non-natural kind of coordination, such as *John and John* or *loves Mary and loves Mary.*[12]

Therefore, it is obviously necessary to relax some of the unification requirements in (29) as suggested in (30).[13]

(30) M → M1 M2 where M1 = M2 = M
(modulo tsf, spell, sem)

3.2 Non-constituent Coordination in English

Typical examples of non-sentential coordination in English include the sentences in (31), (32) and (33). An interesting thing about these constructions is that we find 'fragmentary' elements either preceding or following the conjunction. Especially interesting cases are those examples in which we find elements that obviously do not form constituent in either of the conjuncts.[14]

In traditional transformational grammars, some or other versions of Conjunction Reduction was thought to be responsible for a major part of these constructions.

[9] A brief discussion of these and related issues, including relevance of non-sentential coordination and non-constituent coordination with respect to non-transformational approaches to syntax, can be found in [7].

[10] The greatest problem with transformational approaches to non-sentential coordination was that they did not take semantic difficulties inherent in these approaches quite seriously. See [7] for a brief discussion of this point.

[11] Gazdar stated his theory in terms of a model theoretic semantics for English. Very roughly, his strategy for dealing with semantics of coordination of non-sentential categories was to formulate the semantics in such a way that the semantics of coordination of a given category would be reduced to the semantics of coordination of the category 'one-higher up', so that ultimately, it reduces to the semantics of sentential coordination. Put in this informal manner, this might sound just the reverse of Chomskian Conjunction Reduction, but the point is, Gazdar presented his analysis based on a phrase-structure-based description of English grammar, with rigorous compositional semantics a la Montague.

[12] Expressions such as *John and John* could have a reasonable semantic content; for instance, in cases where there are two distinct persons with the same name *John*. However, even this cannot be allowed in the formulation given here.

[13] There are several remaining issues, such as how we should describe the fact that it is difficult to come up with coordination of determiners or complementizers. On the other hand, these could be a pragmatic problem.

[14] A fuller account of these constructions in English can be found in [13].

In general, Conjunction Reduction is formulated in such a way that the transformational operation deletes the left-most element in the right conjunct under identity with the counterpart in the left conjunct.[15]

Sentences as in (31) are thought to be typical examples of Conjunction Reduction or Left Periphery Ellipsis.

(31) Conjunction Reduction / Left Periphery Ellipsis

a. Did John leave or Mary arrive?
b. John gave the book to Mary and the record to Jane.

If we assume that *Mary arrive* form a constituent in (31, a), this is another example of coordination of like categories and the construction could be accounted for by postulating a general phrase structure rule for coordinating like constituents as shown earlier. However, if we assume the constituent structure for inverted auxiliaries as discussed in [12], this case also must be accounted for by some mechanism for handling non-constituent coordination.

In cases like Right Node Raising as shown in (32, a) and Gapping as shown in (33), however, we find conjuncts that involve elements that do not form constituents in any sense of the term. In this sense, these are often cited as typical examples of non-constituent coordination.

(32) Right Node Raising

a. Mark hated, and Peter detested, the obnoxious girl from New York.
b. Mark hated the obnoxious girl from New York and Peter detested the obnoxious girl from New York.

In (32), the right-most element of the sentence is 'shared' by the two conjuncts. The left conjunct *Mark hated* does not form a constituent in itself, but forms a discontinuous constituent with the left most element of the sentence *the obnoxious girl from New York.* In traditional transformational accounts, an underlying form such as (32, b) was assumed, along with a transformation that 'moves' the shared element 'across-the-board' to the right.

(33) Gapping

a. John ate eels and Mary raw fish.
b. John tried to eat eels and Mary raw fish.
c. John would have liked to try eating eels and Mary raw fish.

In this construction, the 'center' of the right conjunct is 'deleted' under identity with the preceding conjunct. In cases like (33, b) or (33, c), the 'deleted' element is not a constituent. The problem for us with respect to this construction is to determine which elements are to remain, and how to get the semantics of the whole sentence.

[15]Some argued for a more general Conjunction Reduction. Some of those who are against those unrestricted formulations of Conjunction Reduction had to admit certain elliptical process and called this Left Periphery Ellipsis

These constructions that involve reduced coordination present some problems to declarative approaches to syntax such as JPSG, where regularities are expressed in terms of constraints that hold among feature specifications of syntactic categories involved in a local phrase structure. The problem with reduced coordination is simply that we find non-constituents in these constructions. Although earlier expositions of JPSG, as can be found in [6], [8] or [10] did not give a straightforward answer to these questions, these constructions could be accounted for rather neatly within the general framework.

Some of the examples in (31) could be accounted for by assuming coordination of relevant syntactic categories. More difficult issues is how to deal with constructions such as (32) or (33), where elements that do not form constituents are involved. However, in the case of English, we can come up with the following sort of explanations, since 'reduction' or 'deletion' is, in some pretheoretic sense, structure dependent, even in 'non-constituent coordination'.

As a first approximation for a phrase-structure-based account of right node raising as exemplified by the sentence in (32, a), something like the following is conceivable.[16]

In JPSG, left dislocation such as relativization, *wh*-question and topicalization are dealt with by making reference to feature called slash that takes list of categories as its value.[17]

In addition to this feature slash that would propagate information concerning the distribution of gaps for left dislocation, we will introduce a new feature r-slash that would carry information concerning gaps for right dislocation. Thus, the left conjunct, the right conjunct, and the right-most element in (32, a) would be assigned the following sort of feature specifications.

(34) a. Mark hated = v[past, 3s, r-slash $\langle n[] \rangle$]
b. Peter detested = v[past, 3s, r-slash $\langle n[] \rangle$]
c. the obnoxious girl from New York = n[]

A phrase structure rule for canceling gap propagation, that is symmetrical to topicalization must be postulated.

(35) M → H D where M = H (modulo r-slash),
r-slash(H) = D,
r-slash(M) = $\langle\,\rangle$

This rule for right topicalization and a general rule for coordination in (30) would be sufficient for treating constructions that involve right node raising, although there remain several descriptive problems that has to be considered.[18]

Gapping, as exemplified by the sentences in (33), is known to occur among utterances made by two speakers and is related to double *wh*-question and double focus construction. Sag *et al.* (in [13] pp.156-164) and independently Harada (in [7]) proposed to treat the right

[16]This treatment of right node raising is basically a reformulation of the treatment by Gazdar in [4].

[17]See [8] for details.

[18]See the discussion in [2] for restrictions on right node raising.

conjunct in those constructions as concatenations of 'saturated maximal projections' rather than a 'sentence' with its middle part deleted. This would be sanctioned by a phrase structure rule that would expand a tensed sentence with two additional maximal projections of lexical categories.[19]

(36) M → H and D1 D2 where pos(H) = v,
tense(H) = fin,
subcat(H) = ⟨ ⟩,
subcat(D1) = ⟨ ⟩,
subcat(D2) = ⟨ ⟩

In transformational account of syntax where clause-internal dependencies were described in terms of transformations, sentences of the form in (31) could be generated only by assuming transformations such as Conjunction Reduction, because the 'underlying structures were such that coordination of like categories cannot account for these constructions.

On the other hand, phrase-structure-based account of English syntax, where clause-internal dependencies are accounted for in terms of lexical rules rather than transformations, as given in GPSG or HPSG, makes it possible to deal with these examples by simply assuming a very general rule for coordinating like categories, as given in (30). Those non-constituent coordination that cannot be fully accounted for by (30) are to be dealt with by Right Node Raising and Gapping

More intriguing examples are reported in the literature, but in very general terms, we have a good hope of accounting for the major part of these constructions from phrase structure point of view.

On the other hand, with respect to Japanese, we find examples that seem to force us to employ elliptical mechanisms that are somewhat reminiscent of Conjunction Reduction that has been proposed for non-constituent coordination in English.

4 Reduced Juxtaposition in Japanese

In Japanese, we find examples that fairly well seem to correspond to non-constituent coordination in English. For instance, the sentence in (ex1) is similar to right node raising in the sense that the right-most element of the sentence is 'shared' by the left conjunct and the right conjunct, and it is similar to gapping in the sense that one 'transitive verb' takese two pairs of 'subject-object' combination.[20]

(37) Taro-wa Hanako-ni, Ziro-wa Megumi-ni,
Taro-SBJ Hanako-IOB Ziro-SBJ Megumi-IOB
hana-o okutta
flower-OBJ sent

In the case of relatively simple sentences as shown in (37), it could be possible to deal with them by extending the way we suggested for English, but the sentence in (38) poses a rather serious problem for such approaches.

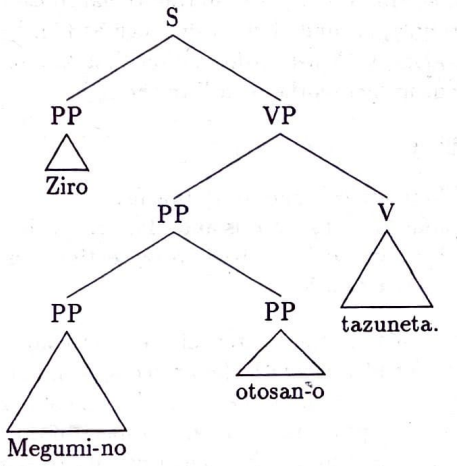
(38) Taro-wa Hanako-no, Ziro-wa Megumi-no,
Taro-SBJ Hanako-POSS Ziro-SBJ Megumi-POSS
otosan-o tazuneta.
father-OBJ visited

An interesting fact about the Japanese sentence in (38) is that none of the left remnant, the right remnant and the right-periphery form constituents in any sense of the term, whereas in the case of English, either the element that remain, or the element that is deleted is in general a maximal projection of lexical categories or concatenation of these maximal projections.

Pretheoretically, English is more structure dependent than Japanese even in cases where this kind of ellipsis takes place. In Japanese, on the other hand, we see sentences that seem more like the English counterparts as shown in (37), but in the case of (38), the elliptical process occurs in such a way that it does not respect constituent structure of the sentence involved. This could be seen from the fact that the constituent structure of (39) is roughly as shown in (40).[21]

(39) Ziro-wa Megumi-no otosan-o tazuneta.

(40)



[19]This is essentially a reformulation of (116) in [13] (pp.161).

(116) V^2[CONJ α] → α, X^{2+} where $\alpha \in$ {*and, but, nor, or*}.

With respect to semantic interpretation of this construction, they state as follows;

> The semantic interpretation for structures admitted by (116) may be given by the rule informally stated in (119):
>
> (119) The interpretation of an elliptical construction is obtained by uniformly substituting its immediate constituents into some immediately preceding structure, and computing the interpretation of the results.

[20]'Head-sharing' might be the correct way to think about this situation.

[21]Here, the case-marking postposition *o* is attached to *otosan* rather than *Megumi-no otosan*, just to simplify our graphic representation.

As can be seen clearly in (40), none of *Taro-wa Hanako-no*, *Ziro-wa Megumi-no* and *otosan-o tazuneta* in (38) form constituent in the relevant sense of the term. Therefore, it is rather difficult to utilize the approach we employed in accounting for right-node-raising or gapping in English.

If our pretheoretic understanding that Japanese show lower dependency on constituent structures even in cases of ellipsis in juxtaposition, it would become necessary to postulate a two-stage description of Japanese grammar. First, we would have a completely phrase-structure-based description of Japanese, where the kind of elliptical process that we are concerned with here is not taken into account. Second, we would postulate an elliptical process which applies to the string of Japanese words, disregarding the constituent structures involved.[22]

Assuming the kind of phrase structure based description of Japanese syntax and semantics as explicated in [10], we could formulate the following sort of elliptical rule. (41) is the syntactic part of the rule, which states what sort of strings of words are accepted as Japanese sentences with possible ellipsis.

(41) [RULE FOR REDUCED JUXTAPOSITION IN JAPANESE]
$X + Y + Z$ is a sentence in Japanese
if
both $X + Z$ and $Y + Z$ are sentences in Japanese,
where X, Y, Z are strings of Japanese words, and '+' designates concatenation.

The semantic rule in (42) states how one can get the semantic representation or the meaning of the sentence obtained by (41).

(42) [SEMANTICS FOR REDUCED JUXTAPOSITION IN JAPANESE]
$[\![X + Y + Z]\!] = [\![X + Z]\!] \wedge [\![Y + Z]\!]$
if
$X+Y+Z, X+Z, Y+Z$ are all sentences in Japanese,
where $[\![W]\!]$ is the semantics of W.

The way (41) and (42) are stated, they also account for cases like (43) where ellipsis occurs within an embedded clause, along with cases where ellipsis occurs in the main clause as in (37) or (38). [23]

(43) Saburo-wa Taro-ga Hanako-ni, Ziro-ga
Saburo-SBJ Taro-SBJ Hanako-IOB Ziro-SBJ
Megumi-ni hana-o okutta to itta.
Megumi-IOB flower-OBJ sent COMP said

At first glance, the syntactic rule for ellipsis in (41) seem rather similar to Conjunction Reduction proposed by Chomsky (24), repeated here in (44). However, there are a couple of important differences between the two.

(44) If S1 and S2 are grammatical sentences, and S1 differs from S2 only in that X appears in S1 where Y appears in S2 (i.e., S1 = ... X ... and S2 = ... Y ...), and X and Y are constituents of the same type in S1 and S2, respectively, then S3 is a sentence, where S3 is the result of replacing X by X + and + Y in S1 (i.e., S3 = ... X + and + Y ...).

First of all, (44) is a transformational rule that applies to a structure to produce another structure, both of which are posited presumably between deep structure and surface structure, whereas (41) applies to a string of words to see whether a given string of words is acceptable or not. Also, (44) is utilized for explaining coordination of noun phrases and verb phrases within a sentence, whereas (41) is used strictly for accounting for reduced juxtaposition in Japanese. Third, variables like X or Y in (44) are assumed to be constituents, whereas variables in (41) are strings of words.

Our problem here are, except for the fact that rules in (41) and (42) are stated too informally, these elliptical rules seem to be a little too general and too permissive, in the sense that they would over-generate a lot of stuff that are not very good as Japanese sentences. One might also question whether postulation of these elliptical rules are compatible with our basic underlying assumption of phrase-structure-based approach to grammar description, that is, regularities in syntax are to be stated in terms of constraints that hold among feature specifications of categories that are involved in a local phrase structure. Postulation of an elliptical rule might seem to be introducing a 'transformational apparatus' into our description of grammar. However, our rule is stated in a purely declarative way, dictating that such and such strings of words are deemed acceptable if such and such strings of words are. Although the rule does not refer to any local structure, and therefore is not a phrase-structure-based account of the problem in the literal sense of the term, this is quite compatible with our underlying assumption, that is, description of grammar is given in a declarative form, stating constraints that must be satisfied for a given expression to be acceptable in a given sentence.

One important issue to be pursued in this connection is to see the details of conditions under which ellipsis is possible. Especially, it would be nice if we could find any further syntactic conditions on its applications. In (41), X or Y are assumed to range over strings of words, but this might seem to be a little to permissive. If we were able to restrict these variables, say as ranging over strings of PPs, we might be able to employ the analysis we utilized for gapping as in (36). However, this line of reasoning does not work out well, because we have examples as follows.

(45) Taro-wa Hanako-ni ni-hon, Megumi-ni
Taro-SBJ Hanako-IOB two-CLSF Megumi-IOB
san-hon-no bara-o okutta.
three-CLSF-ADN rose-OBJ sent

[22] This two-way distinction of grammar description might correspond to the distinction between a *basic grammar* and an *extended grammar* in categorial grammar. (See [2], especially p.154)

[23] If we have a rule where ellipsis occurs in the periphery, we might have to claim that the rule applies 'cyclically' or that 'periphery' is defined on the basis of syntactic structures of the sentence involved.

CLSF is intended for shorthand for 'noun-classifier'. In Japanese, expressions for cardinality of nouns are formed by adjoining numerals, like *iti* (one), *ni* (two), *san* (three), *si* (four), and so on with classifiers that are determined according to the noun, such as *hon* for *bara* (rose) or *ki* (tree), *nin* for *gakusei* (student) or *zyokyaku* (passenger), *mai* for *binsen* (letter paper) or *sen'en'satu* (a thousand yen bill) and so on. These numeral classifier combination can precede nouns when they are adjoined to general adnominal forming postposition *no* or immediately follow nouns. Thus, Japanese expressions for *two roses* would either be *ni-hon-no bara* or *bara-ni-hon.*[24]

Quantifier and numeral-classifier combinations easily form constructions of the type under consideration. It might be the case that 'contrast' that reduced juxtaposition presuppose are easily obtained with these elements. However, 'chopping' of postpositions is not restricted to these cases. A more simple example that shows that we cannot restrict the variables to be strings of PPs rather than words is sentences like (46).

(46) Taro-wa Hanako, Ziro-wa Megumi-ni bara-o
Taro-SBJ Hanako, Ziro-SBJ Megumi-IOB rose-OBJ
okutta.
sent

These examples clearly show that we cannot restrict the application of juxtaposition reduction in such a way that postpositional phrases remain intact.

On the other hand, 'chopping' of verbal elements seems impossible, although this might simply be a reflection of the difficulty of constructing reasonable contrast with respect to verbal elements. The example in (47) is possible only with the reading in (48, a) and not with that in (48, b).

(47) Taro-wa hon-o yomi bara-o okutte
Taro-SBJ book-OBJ read rose-OBJ sent
moratta.
BENEFACTIVE

(48) a. Taro read a book and had a rose sent.
b. Taro had a book read and a rose sent.

[24]Here, we disregard the question of floated quantification. In Japanese, quantifiers in general and numeral-classifier combinations in particular can 'modify' a noun phrase even when they are positioned slightly away from the noun phrase they modify. Thus, schematically, we have the configurations of the following sorts:

NP internal constructions:
(i) ni-hon-no bara-o
(ii) bara ni-hon-o

Floated Quantification constructions:
(i) ... ni-hon bara-o ...
(ii) ... ni-hon ... bara-o ...
(iii) ... bara-o ni-hon ...
(iv) ... bara-o ... ni-hon ...

There are subtle problems regarding the relative positioning of nouns and numeral-classifier combinations. (See [11] for some discussions and proposals on this point.) Note, however, that 'no' appears only when the numeral-classifier combination immediately precedes the noun inside the noun phrase in question.

This point is further verified by the fact that the sentence in (49) is possible only with the reading in (50, a) and not with that in (ex2, b).

(49) Taro-wa Hanako-ni hon-o yomi
Taro-SBJ Hanako-IOB book-OBJ read
Megumi-ni bara-o okutte moratta.
Megumi-IOB rose-OBJ sent BENEFACTIVE

(50) a. Taro read a book for Hanako and had Megumi send a rose for him.
b. Taro had Hanako read a book for him and Megumi send a rose for him.

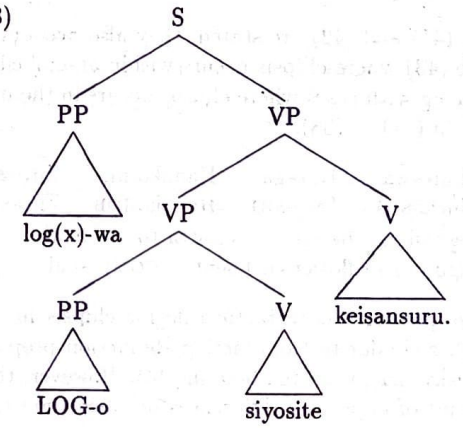
In fact, a rather unexpectedly wide range of reduction seems possible. For example, the sentence in (51) sounds a little bit 'artificial', but it is not exactly unacceptable.

(51) Taro-wa Hanako-ga ronbun-o, Ziro-wa
Taro-SBJ Hanako-SBJ paper-OBJ Ziro-SBJ
Megumi-ga hyoron-o kakaseta otoko-o
Megumi-SBJ review-OBJ write-made man-OBJ
mituketa.
found

Also, a sentence like (52) was found in a naturally occurring context.[25]

(52) kokode log(x)-wa taisu
here log(x)-TOP logarithmic
kansu LOG (tanseido zissukei)-o
function LOG (single precision real number)-OBJ
e-wa sisu
e-TOP exponential
kansu EXP (tanseido zissukei)-o
function EXP (single precision real number)-OBJ
siyosite keisansuru.
utilize calculate

(53)



In the face of these examples, it seems that stating syntactic conditions under which ellipsis is allowed seems a rather difficult task.

[25]Bill Poser: personal communication.

5 Further Implications of Reduced Juxtaposition

If we allow unrestricted application of the rules for reduced juxtaposition in (41), we could argue that (54, c) is formed from (54, a) and (54, b) through 'juxtaposition reduction'.[26]

(54)

a. Taro-ga izimeta.
Taro-SBJ teased

b. Hanako-o izimeta.
Hanako-OBJ teased

c. Taro-ga Hanako-o izimeta.
Taro-SBJ Hanako-OBJ teased

There are two options to be considered in this connection. One is to restrict application of juxtaposition reduction to cases where some sort of 'likeness' of elements or 'parallelism of structure' among conjuncts is involved. However, this structural 'parallelism' is known to be difficult to characterize syntactically. The other is to formulate semantic representations in a Davidsonian approach, so that the rule not only accounts for reduced juxtaposition in Japanese but also to a fairly wide range of syntactic phenomena in Japanese. Especially, since we have to give information regarding subcategorization of each verb in the lexicon, this information will quite naturally induce the sentences in (54, a) and (54, b). Given juxtaposition reduction, since the ordering of (54, a) and (54, b) is just an accident, the reverse order does not involve any problem, which means that sentence like (55) is also possible along with that in (54, c)

(55) Hanako-o Taro-ga izimeta.
Hanako-OBJ Taro-SBJ teased

In this view, rules in (41) and (42) are no longer limited to reduced juxtaposition but should be regarded as the most basic rule for Japanese sentences. One possible problem of this approach is that (58) is quite awkward and probably unacceptable while (56) and (57) are all right. Presumably, this has to be given a semantic or pragmatic account.[27]

(56) Taro-ga hasiru.
Taro-SBJ run

(57) Miti-o Ziro-ga hasiru.
Miti-OBJ Ziro-SBJ run

(58) * Taro-ga miti-o Ziro-ga hasiru.
Taro-SBJ road-OBJ Ziro-SBJ run

However, we must also note that sentence like (59) is possible.

(59) Taro-ga, sono yoko-o Ziro-ga, hasitteiru.
Taro-SBJ the side-OBJ Ziro-SBJ is-running

Whatever pragmatic account that deals with this must be able to make it clear why the agent and patient relation in the sentences in (60) and (61) are understood the way they are.

(60) Taro-ga Hanako-o, Ziro-ga Megumi-o
Taro-SBJ Hanako-OBJ Ziro-SBJ Megumi-OBJ
izimeta.
teased

(61) Hazimeni Taro-ga Hanako-o, sorekara Ziro-ga
first Taro-SBJ Hanako-OBJ next Ziro-SBJ
Megumi-o, saigoni Saburo-ga Naomi-o
Megumi-OBJ last Saburo-SBJ Naomi-OBJ
izimeta.
teased

In either case, these should be given a pragmatic account along with the interpretation of *respectively* in English as shown in (62), and sloppy coordination in Japanese as shown in (63).

(62) Peter and Mark love Mary and Jennie, respectively.

(63) Taro-wa terebi-ya razio-o mi-tari
Taro-SBJ television-CONJ radio-OBJ see-CONJ
kii-tari suru.
listen-to-CONJ do

6 Conclusion

We have seen in this paper that reduced juxtaposition in Japanese could not be neatly accounted for without postulating some elliptical process that operates on an independently sanctioned sentences to form a new and elliptical construction. This ellipsis could operates in such a way that it chops off in between a noun phrase and a postposition, but it would not operate in such a way that a verb-auxiliary combination is split apart. In order to incorporate such an elliptical process into a phrase-structure-based declarative description of Japanese grammar, we postulated rules as given in (41) and (42). However, we have to stress that this is something completely different from 'transformational operations'. The analysis proposed here basically assumes a phrase-structure-based description of Japanese syntax and semantics. String-based operation for ellipsis is introduced only in connection with reduction or ellipsis that is triggered by juxtaposition of identical strings of elements. We saw that a wider application of these rules is conceivable from a slightly different point of view of the Japanese grammar.

In the case of non-constituent coordination in English, apart from the GPSG-based treatment by Sag *et al.*, categorial grammar provides quite an interesting view of the situation. Dowty deals with a similar set of non-constituent coordination through type-raising and functional composition. (See [2].) That treatment is similar

[26] This point was brought to my attention by Syun Tutiya.

[27] Bill Poser and Hiroyuki Suzuki (personal communication) have pointed out these problems.

to the one proposed here in the sense that constituency is paid lesser attention than in previous analyses of related constructions. Also, the two layer description of Japanese grammar proposed informally in this paper, the 'core' without ellipsis and the 'extention' with ellipsis, might, in some abstract sense, correspond to the distinction Dowty suggests between the 'basic grammar' and the 'extended grammar'.

A number of interesting consequences might result if we pursue the possibility suggested with respect to the 'drastic' interpretation of juxtaposition reduction. Also, we have to note that JPSG and other phrase-structure-based grammar formalisms do not make use of such structure dependent relations as c-command in the description of syntactic regularities, which in turn suggest that such notions as phrase structure configuration could be totally dispensed with in the description of syntactic regularities that are found in natural languages. In fact, many of the statements in JPSG could be thought of simply as specifying relations between strings of words and syntactic characterizations corresponding to them rather than relations among syntactic categories. In such a view, reduced juxtaposition as proposed here is simply a natural extension of the declarative description of Japanese grammar that has been advanced in the general framework of JPSG.

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