

TOPICS IN RELATIONAL GRAMMAR

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0. There is a recent offshoot from transformational grammar known as Relational Grammar (RG). The most fundamental assumption of this theory of grammar is that grammatical relations such as subject and object are not to be defined derivatively in terms of structural configurations (as in the theory of transformational grammar) but rather are considered as primitive syntactic notions, to which syntactic rules can have direct access. In the most well-known (though still unpublished) version of RG proposed by Perlmutter and Postal, it is claimed that the cyclic component of syntax operates exclusively on relational structure. Until all those 'relational' rules have applied, the left-to-right order of elements does not come into play. Syntactic rules are accordingly divided into two distinct categories: those that affect relational organization and those whose effect is to make structural modification. Rules of the former class are further classified with respect to their relational effect. Perlmutter and Postal admit only three members in the set of basic grammatical relations: subject, direct object, and indirect object, which they represent as 1, 2, and 3, respectively. Johnson recognizes a fourth relation, oblique object. In a different version of RG, Keenan and Comrie (1972, 1977) make more fine-grained distinctions among such relations as object of preposition, possessive, and object of comparative particle. These grammatical relations form a relational hierarchy in the above-mentioned order, with subject occupying the highest rank. NPs that bear a grammatical relation are called 'terms'; those that do not are called 'non-terms'. Perlmutter and Postal propose that relation-changing rules (which we shall term as 'transrelational' later in this paper) must increase the rank of the affected NP (Reranking Law). This constraint permits rules to convert terms of a lower grammatical relation into those of a higher relation, or non-terms into terms; such rules are called 'advancement rules'. Other types of rules permitted by the Reranking Law are rules that raise an NP out of a host NP ('ascension rules') and rules that insert dummy elements (e. g. there, it) into the position of a term ('insertion rules'). Whenever a rule creates a new term of grammatical relation, the NP that used to bear that relation in the input is thereby deprived of its termhood (Relational Annihilation Law; RAL). Such ex-terms are called 'chomeurs' and are no longer allowed to come to bear grammatical relations. In the case of ascension (raising) rules, the NP raised out of the host NP will bear the grammatical relation that the host NP used to bear (Relational Succession Law). The remnant of the host NP will automatically lose its termhood and becomes a chomeur. When an advancement rule creates a term on a certain cycle, that term cannot be put en chomage by an application of another advancement rule on the same cycle (Advancee Tenure Law). There are other relational constraints proposed by Perlmutter, Postal, Johnson, and other relational grammarians,

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but the above may suffice for the purpose of illustrating the essentials of the theory of RG. *

It should be clear even from this cursory presentation that RG purports to put a heavy limitation on the expressive power of particular grammars by enriching the universal grammar. And the constraints thus proposed often grant us an account of the restrictions which would otherwise have to be stated ad hoc in particular rules. For example, as has been observed by Berman (1973), the NP in a passive agentive by-phrase cannot be raised by Tough Movement:

- (1) a. It is unpleasant to be kicked by John.
b. *John is unpleasant to be kicked by.

But this restriction does not have to be stated in the statement of Tough Movement, or, for that matter, in the grammar of English, because it automatically follows from the relational constraints quoted above. In RG, Passivization is an advancement rule that converts a former direct object to a derived subject ($2 \rightarrow 1$); this simultaneously demotes the former subject to a chomeur, which is prohibited from coming to bear any grammatical relation whatsoever. Now the RG version of Tough Movement is an ascension rule that raises a non-subject term from a subject complement; the raised NP must come to bear the object relation, due to the Relational Succession Law. Thus the NP in the agentive phrase cannot be tough-moved, since if it were, it would have to bear the subject relation, which it, being a chomeur, cannot. Such sentences as (1b) are excluded in principle, without any ad hoc statements in the grammar of English.

The present paper will discuss a few topics on rule typology and rule interaction as conceived in the framework of RG. We shall in particular address ourselves to two major problems: recognition of a new class of transrelational rules called 'reassessment', and of a new type of rules called 'relatio-structural rules' with an associated ordering principle.

I. Structural Reassessment in RG

In the present section we will propose a new type of relational rule, which we call 'reassessment rule'. A reassessment rule takes a verb and some elements related to it and treats the set of these elements as a single head of relational organization; as a consequence the termhood of some NPs may undergo adjustment. The elements which a reassessment rule combines with a verb to form a single compound verb are confined to those that form a continuous portion with the verb in a dependency representation. We will illustrate these points with discussion of some English passive sentences. The process called variously as 'Predicate Raising' or 'Clause Union' is but a special instance of reassessment rule. We will end this section with some discussion of the problems that arise from the relational adjustment of NPs after Predicate Raising in Japanese.

* The major sources of information about RG that I have benefited from are lecture notes by David Perlmutter (at RILP, 1973), Perlmutter and Postal's Linguistic Institute handouts (1974), and the papers in Cole and Sadock (eds.), *Grammatical Relations, Syntax and Semantics* Vol. 8, New York: Academic Press (1977).

Passive in English

Consider the well-known rule of Passivization in English. The Perlmutter-Postal version of Passivization is an advancement of direct object to subject, with minor morphological modifications (e. g. the chomeur created by the rules is marked with the preposition by-etc.). But this formulation runs into immediate difficulty when we consider pseudo-passives such as (2)-(3) and double passives such as (4).

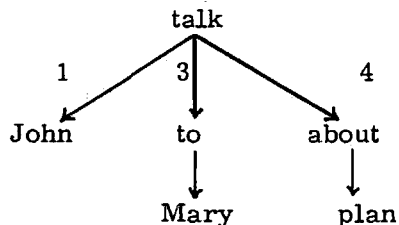
- (2) a. John talked to Mary about the plan.
b. Mary was talked to about the plan.
c. *The plan was talked to Mary about.
- (3) a. John talked about the plan to Mary.
b. *Mary was talked about the plan to.
c. The plan was talked about to Mary.
- (4) a. John took advantage of Mary's innocence.
b. Mary's innocence was taken advantage of by John.
c. Advantage was taken of Mary's innocence by John.
d. ?Advantage of Mary's innocence was taken by John.

In (2) and (3), either of the two objects of preposition can become a passive subject, provided that it is the first NP after the verb. Since the only visible difference between (2) and (3) is the order of two PP's, this may seem a counter-example to the RG formulation of Passivization and support instead the traditional transformational statement, as argued in Chomsky (1973). In the case of double passives we would have to claim that both 'advantage' (or possibly the entire phrase 'advantage of Mary's innocence'; cf. (4d)) and 'Mary' are direct objects in (4a). And this contradicts our intuition that any grammatical relation should be borne by just one term.*

It seems to me, however, that these problems are circumvented by introducing what I have termed 'reassessment rules', which reassess the relational structure of the input sentence and assign a new relational organization. Consider sentence (2a) by way of example. The relational organization of this sentence can be represented, in terms of a dependency tree, as in Fig. 1.

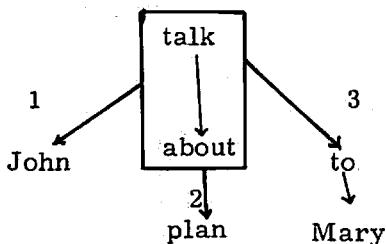
* This is one clause of my 'Functional Uniqueness Principle' (Harada 1975); the other clause states that no term may bear more than one grammatical relation. Johnson's (1977) Unique Dependency Principle corresponds just to the latter clause of the Functional Uniqueness Principle. Let us distinguish these two clauses by calling the former the 'Unique Realization Principle'. Though this principle is intuitively appealing, it might not be universally maintained. Cf. Gary and Keenan (1977).

Fig. 1. The relational organization of sentence (2a): arrows indicate government, and the numerals indicate grammatical relations. Articles and tenses are omitted from this diagram.



We would like to propose that there is a reassessment rule associated with the lexical item talk that reassesses the chunk consisting of 'talk' and the preposition 'about' as a single predicate (call it a 'territory'); this process will automatically convert the former object of preposition 'plan' to a derived direct object, as in Fig. 2.

Fig. 2. The derived relational organization of sentence (2a) after reassessment: the box indicates the 'territory', with respect to which the relations are reorganized.



Now that the chunk 'talk about' has been reassessed as a single territory, it cannot be separated by an intervening element; hence the surface contiguity of 'talk' and 'about'. Notice that this account does not prohibit affixation of tense on 'talk', which does not represent intervention.

The above account can naturally be extended to the case of double passives. The relational structure of (4a) would be represented as in Fig. 3a. The result of reassessment is shown in Fig. 3a.

Fig. 3 a) Relational structure of sentence (4a) prior to reassessment.

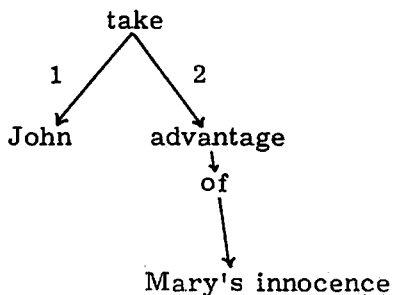
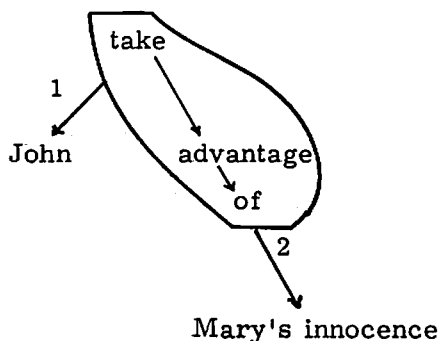


Fig. 3 b) Relational structure of sentence (4a) after reassessment.

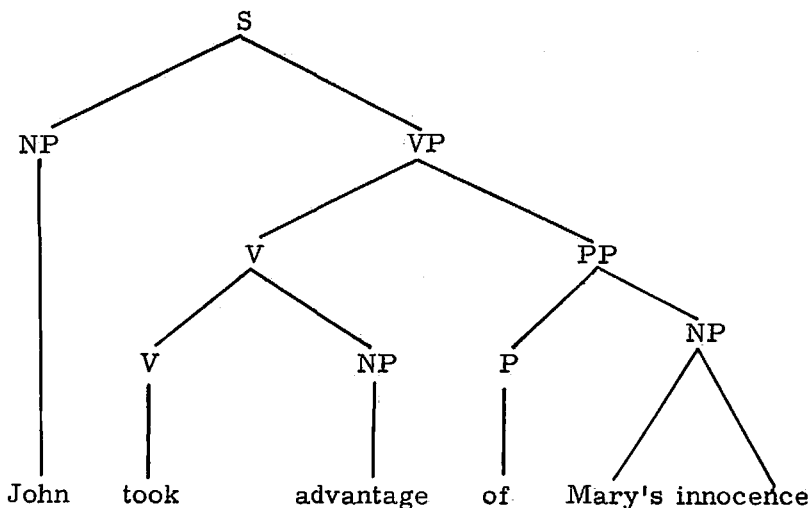


It is only after the reassessment rule has converted the NP 'Mary's innocence' to the direct object of the territory 'take advantage of' that this NP can be promoted to subjecthood by Passivization. Note that this reassessment rule is optional, so that we have two possible inputs to Passivization; but in each case, the effect of Passivization is unique. When reassessment takes place, the derived 'territory' forms a kind of island, and thus the NP 'advantage' cannot be extracted from the structure in Fig. 3b. This account receives support from the following observation as well;

- (5) a. ?It was unfair advantage that John took of Mary.
 b. *It was unfair advantage that Mary was taken of.

Though sentence (5a) is slightly awkward, it is more acceptable than (5b). This contrast can be naturally explained in our framework but not in transformational grammar. In our terms, (5b) is ungrammatical because the NP 'unfair advantage' has been extracted from an island-forming reassessed territory. In the framework of transformational grammar, however, the double passive facts would have to be accounted for by assigning to such sentences as (4a) an underlying structure like Fig. 4 which allows ambiguous proper analyses with respect to Passivization.

Fig. 4. Underlying structure for sentence (4a) as proposed by Bresnan (1972) in the framework of transformational grammar.



Given the standard linear formulation of the Passivization transformation, with the structural description (X, NP, Aux, V(P), NP, Y), this underlying structure does yield double outputs, allowing both 'advantage' and 'Mary's innocence' to be analyzed as the NP immediately after V(P). This account, however, has nothing to offer for the inextractability of the NP 'advantage' after the NP 'Mary's innocence' has been passivized. Hence this account must be supplemented by an ad hoc restriction on clefting to exclude such sentences as (5b). The relational account seems much superior therefore to the transformational account.

The following observation provides yet another piece of confirmation for the correctness of the relational account. Consider cases where a certain NP has been shifted to the position that immediately follows the main

verb (except for a possible preposition) but has not been subject to relational adjustment. The transformational Passivization rule permits the NP to be subjectivized, and if we do not want it we would have to impose a special restriction on rule ordering. On the other hand, the relational version of Passivization depends on the direct objecthood of the affected NP and is therefore inapplicable in such cases. Now consider the following:

- (6) a. The policeman explained the reason to us.
 b. *The policeman explained to us the reason.
 c. The policeman explained to us that the area was off limit to kids.
- (7) a. *We were explained to that the area was off limit to kids.
 b. The reason was explained to us by the policeman.

The contrast between (6a) and (6b) shows that explain occurs in the underlying context [___ NP to NP], and its occurrence in the environment [___ to NP NP] as in (6c) is due to the application of Complex NP Shift. The contrast between (7a) and (7b) indicates that Passivization cannot apply to the object of to which has been transposed to the position immediately following the main verb by Complex NP Shift. (Cf. (2b) in this respect.) In the transformational framework, this requires an extrinsic ordering statement that Passivization precedes Complex NP Shift. But such a statement is totally unnecessary in the relational account we have developed here. Such sentences as (6c) are derived without modification on relational organization; reassessment of 'explain' and 'to' as a territory is precluded because it would create a violation of the Unique Realization Principle, yielding a double direct object structure. Thus there is no passive corresponding to (6c).*

Predicate Raising as Structural Reassessment

Actually, reassessment rules have been widely recognized outside the grammar of English. In a number of languages, including Japanese (Nakau 1973), French (Kayne 1976), German (Harbert 1977), Uto-Aztecan (Langacker 1974), there is a rule that combines the main verbs of a matrix and a complement clause; such a rule is called 'Predicate Raising' or 'Clause Union'. In Japanese, for example, Predicate Raising applies to such a wide range of constructions as passive, causative, potential, desiderative, ease/difficulty constructions. Figs. 5, 6, and 7 illustrate the effect of this rule in relational terms, considered as a reassessment rule.

* The situation would worsen for the transformational account if one attempted to generalize Complex NP Shift and About Movement (or PP Shift) into a single rule, as Bresnan (1976) did. This would cause an ordering paradox, since the resulting rule, call it the 'Complex Phrase Shift', must apply before Passivization in some cases (cf. (2) and (3)) and after it in the other cases (cf. (6) and (7)). No such paradox will arise in the RG framework. Complex Phrase Shift phenomena are treated in terms of the linearization process that takes place when the relational dependency structure is translated into a linear structure. The ordering Passivization-Complex Phrase Shift, if ever needed, would follow automatically from the assumptions of RG.

Fig. 5 : The effect of reassessment in the derivation of the causative sentence "Taroo ga Ziroo o arukaseta" (Taro made Jiro walk.)

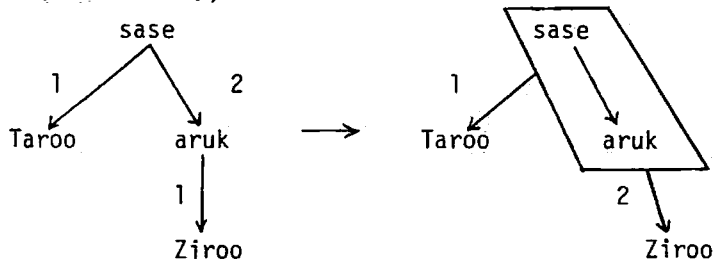


Fig. 6: The effect of reassessment in the derivation of the passive sentence "Taroo ga suri ni saihu o nusumareta" (Taro had his purse stolen by a pickpocket.)

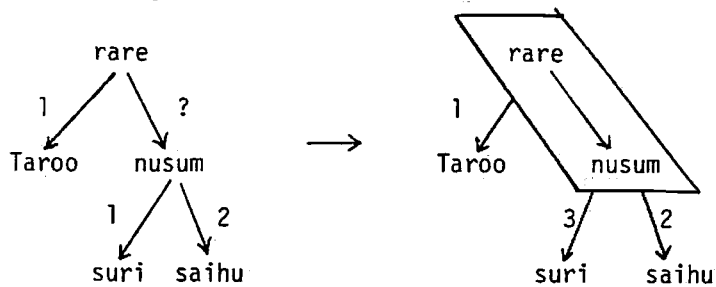
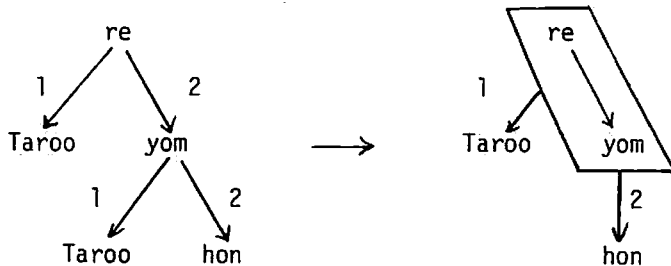


Fig. 7: The effect of reassessment in the derivation of the potential sentence "Taroo ga hon o yomeru" (Taro can read books.)



As is clear from these figures, the reassessment process is accompanied by a number of readjustments in clausal composition, even though the process itself is quite simple.

In traditional transformational framework, such rules have posed some intricate problems. In particular, their formal nature is quite different from usual transformations in that such rules as Predicate Raising do not affect the linear order of the elements to which they apply. In terms of the conventional notation for the statement of rules, they would be represented as follows:

(6) Predicate Raising (obligatory)

$$X - V - V - V \rightarrow 1 - \emptyset - 2+3 - 4$$

One common view (expressed explicitly by Chomsky 1973: footnote 33) is that such rules are not properly rules of syntax but rather belong to the 'readjustment rule' component, which modifies syntactically motivated

structures into phonologically interpretable ones.

But further considerations on the interaction of Predicate Raising and other rules show that this view is untenable. Notice first that the above conception of Predicate Raising entails that this rule will follow all the rules of syntax, since it belongs to a component connecting syntax and phonology, or at least that it will be an end-of-cycle rule (but precedes the Nuclear Stress Rule; cf. Bresnan 1971). This prediction is false, however. There is evidence that Predicate Raising in Japanese is a cyclic rule, feeding another cyclic rule (i. e., Subject Honorification). See Harada 1976: 514-516 for the argument.

(7) Tanaka sensei wa seito ni takusan no hon o o-yom-ase ni nau.

'Professor Tanaka has his students read a lot of books.'

Thus, if Predicate Raising were a readjustment rule at all, it would have to be a very early readjustment rule. But this is simply counterintuitive.

There are more interesting instances of rule interaction involving Predicate Raising. In Japanese there is a rule that marks certain occurrences of embedded subject with the indirect object marker *ni* (Kuno's Agentive *ni*-Attachment). This rule is confined to a very limited set of constructions, including causatives, passives, desideratives, ease/difficulty constructions, etc.; that is, to a proper subset of the set of constructions to which Predicate Raising is obligatorily applied. It can also be observed that the rule of Equi NP Deletion, which is usually optional in Japanese, is nevertheless obligatorily applied just in case the sentence undergoes Predicate Raising.

In an earlier paper (Harada 1975) I attempted to account for such rule interactions by means of an initially plausible putative universal principle of relational uniqueness (see the footnote on p.). This principle states that one grammatical relation of a given predicate must be represented by just a single NP and conversely one NP may bear at most one grammatical relation. Assuming this principle the Agentive *ni*-Attachment can be totally eliminated from the grammar of Japanese, so the argument went, because its effect can be entirely realized by a universal principle for the adjustment of relational conflict arising from the application of Predicate Raising. That is, application of Predicate Raising sometimes results in derived structures with two subjects (of the derived conflated predicate). RAL cannot be invoked here because neither subject has taken over the grammatical relation from other NPs. It was thus proposed that there is an adjustment principle, dubbed the Invader Demotion Principle (IDP), that demotes the former subject of the lower clause to indirect object of the derived clause.

This line of consideration seems basically correct, though, of course, there are problems that remain to be settled. Some of them will be discussed immediately below. Note that the Functional Uniqueness Principle provides a natural account of the double-*o* constraint phenomena which was observed in Harada (1973); see Harada (1975) for details. Moreover, some such demoting principles as IDP are needed in any event, in order to account for the relational adjustment in a wide range of facts.

We would like to address ourselves to the problems with the above account. Consider first the fact that Japanese has sentences with double subjects such as the following:

- (8) a. Taroo ga se ga takai. 'Taro is tall.'
 b. Inaka no hoo ga kuuki ga kirei da. 'The air is cleaner in the country.'
 c. Yosiko ga kodomo ga sinde simatta. 'Yoshiko's child has died.'

The syntactic derivation of such constructions is quite diverse. Some of them are considered to derive from a source like the following, from which they are derived by a transformation called Subjectivization (Kuno 1973):

- (9) a. Taroo no se ga takai. 'Taro's stature is high.'
 b. Inaka no hoo no kuuku ga kirei da. 'The air in the country is cleaner.'
 c. Yosiko no kodomo ga sinde simatta. 'Yoshiko's child has died.'

Let us assume that (9) is the correct source for (8). We shall call the rule involved in the derivation of (8) from (9) the 'Possessive Extraction' rather than Subjectivization to avoid the implication that the process necessarily involves creation of a new subject. Whether this is really the case is the question which we would like to consider below.

There are several possible interpretations of Possessive Extraction in RG. One interpretation is that Possessive Extraction does create a new subject, i. e., is an ascension rule. If this is the case we would expect the initial ga-phrase in (8) to function as derived subject but the second ga-phrase not to function as subject (since it must be a chomeur). Another interpretation is that the rule is a mere movement rule and has nothing to do with grammatical relations. If this is correct, it must be the case that the second ga-phrase behaves as a subject but not the first ga-phrase. Now observe the following sentences:

- (10) a. Dare mo Toookyoo o kuuki ga kirei da to wa omowanai.
 'Nobody considers Tokyo to have clean air.'
 b. Minna wa Taroo o se ga takai to omotta.
 'Taro struck everybody as being tall.'
 (11) Yosiko_i wa kodomo_j ga zibun_i no inai aida ni kuruma ni hanerarete sinde simatta.
 'Yoshiko's child was killed by a car when she was absent.'

The sentences in (10) show that the initial ga-phrase in (8a) and (8b) can be made an object through Subject Raising (Kuno 1976). Sentence (11) demonstrates that the initial ga-phrase in (8c) can be the antecedent of a reflexive pronoun. Since these two properties are sufficient conditions for subjecthood, we can safely conclude that the initial ga-phrase in (8) is a subject.

On the other hand it is very hard, if not impossible, to find relevant facts concerning the subjecthood of the second ga-phrase. One probably relevant example involves Quantifier Float:

- (12) Yosiko ga kodomo ga sannin sinde simatta.
 'Yoshiko's three children have died.'

As is well-known, floating quantifiers in Japanese are semantically

associated only with subject or direct object. At first glance the above example might provide evidence that the second ga-phrase functions as surface subject, since the quantifier is semantically associated with it. But notice that this is so only when one makes a further assumption that the interpretation of the floating quantifier takes place postcyclically. If the interpretation is given cyclically, or the sentence is derived through a syntactic rule of Quantifier Float, then sentences like (12) simply provide evidence for the subjecthood at the stage of a derivation at which the relevant rule is applied. Thus we may perfectly well derive sentence (12) by first applying Quantifier Float and then (the ascension version of) Possessive Extraction.

It seems, then, that the double subject constructions in Japanese, as exemplified by (8), do not constitute real counterevidence to the FUP analysis. Possessive Extraction does indeed create a new subject, and is to be classified as an ascension rule in the RG rule typology.

Let us consider a different topic. It can easily be seen that the relation-adjusting principle IDP is stated in a rather ad hoc manner. In particular, why the principle happens to choose an 'indirect object' (rather than some other grammatical relation) as the asylum for ex-subjects demoted by this principle, remains totally unaccounted for. A more general principle would provide a motivation for the choice.

Suppose that we have the following principle, which has in fact been implicitly assumed in the literature: whenever there arises a relational conflict (of the sort beyond the remedy by RAL), the (ex-) subject of the originally lower clause is demoted to the highest vacant position in the relational hierarchy. Let us call this the 'Sliding Principle'.

The Sliding Principle predicts that when reassessment takes place, complement subject becomes a direct object if the complement sentence is intransitive and an indirect object if the complement sentence is transitive. This is in perfect accordance with the facts from such languages as French, where we have the following paradigms:

- (13) a. Je la ferai venir. 'I will make her come.' (la=accusative)
 b. Je lui ferai lire ce livre. 'I will make her read this book.'
 (lui = dative)

But the Sliding Principle runs into immediate difficulty when it is applied to Japanese. The underlying embedded subject, regardless of whether the embedded sentence is transitive or intransitive, is realized as an indirect object.

- (14) a. Boku wa kawaii onnanoko ni oozei kite hosii.
 'I want a lot of cute girls to come.'
 b. Taroo wa kodomo ni hutari sinareta.
 'Taro had two children die (on him).'

In view of the generality of the Sliding Principle, and the generality of the occurrence of ni on underlying subject, it seems worth pursuing the possibility of resolving the conflict. One approach that comes to my mind which appears sufficiently viable is to allow a variable factor in the relational hierarchy that may vary, within a limited range, from language to

language. Specifically, I would like to propose that the relation 'indirect object' is one such variable, and its position in the relational hierarchy is subject to variation across language. In particular, the relational hierarchy in Japanese puts it between subject and direct object.

(15) Relational Hierarchy for Japanese

subject > indirect object > direct object > non-term

Given these revisions, we can dispense with the ad hoc IDP and retain the more general Sliding Principle. It goes without saying that much empirical study is needed to prove that indirect object is a variable in the relational hierarchy, but the facts about Japanese and a few languages that I know are consistent with this approach.

2. Rule Types and Rule Ordering in RG

Universal Principles of Rule Ordering

There has been a considerable interest in the exploration of the possibility of predicting the known cases of rule ordering by means of universal principles, thereby eliminating extrinsic ordering statements from particular grammars. This line of investigation seems basically sound, though it does not seem feasible to do away with all instances of extrinsic ordering. If it can be shown that most of the rule ordering statements are deducible from universal principles, this will give use a fairly solid basis on which to explain the following fact about language acquisition: children learning the same language come to make up an almost identical rule system, including rule ordering, in a short span of time, even though it seems highly unlikely that the linguistic data available to them contain all the crucial examples needed to establish the correct ordering of rules. Children do not have to learn the ordering of rules independently from the content of those rules; once he acquires a rule, universal grammar automatically specifies the position of that rule in the system.

There are two directions in which such an investigation can proceed. One direction is represented by the studies that have been made under the influence of Andreas Koutsoudas. They are more or less concerned with predicting the relative ordering of rules from the ways in which they interact, e. g. whether the given set of rules can enter into a feeding relation or not. While such studies are of course important, we will not be concerned with them here because they are not directly relevant to topics to which RG is addressed.

The other approach is to categorize syntactic rules from a functional point of view and to assign each such category a fixed place in the rule system. This is equivalent to dividing the syntactic component into sub-components, each consisting of rules of a distinct formal nature. The recent proposal by Chomsky and Lasnik (in press) that deletion transformations follow all other transformations can be interpreted as an instance of this approach.

This latter is also the approach taken by RG. Perlmutter and Postal (1974) draw a distinction between the class of rules which change the termhood of NPs and the class of rules that do not, and propose an isomorphic relation between this categorization and the cyclicity of the rule.

(1) Cyclicity Law

- (a) Rules that change the termhood of NPs are cyclic.
- (b) Rules that do not change the termhood of NPs are postcyclic.

This law correctly predicts the cyclicity of such rules as Passive, Dative Shift, Subject Raising, Object Raising, There Insertion, Extraposition, and Equi; and it also correctly predicts the postcyclicity of such "root" transformations as Topicalization, Cleft Formation, Adverb Preposing, and VP Preposing.*

A Proposed Ordering Principle

Here I would like to take up a case in which Cyclicity Law makes the wrong prediction and propose an additional ordering principle which remedies this defect. Consider such rules as Reflexivization, Number Agreement, Case Marking, and Subject Honorification. These rules do not alter the termhood of NPs, even though they all require reference to grammatical relations. The Cyclicity Law as formulated in (1) above predicts that they are postcyclic, but this prediction is incorrect. There are considerable arguments that the above rules are cyclic; Reflexivization is among the classic examples of cyclic rules; the cyclicity of Number Agreement in English is argued in Harada (1974), from which a paradigm example is quoted below; Case Marking is also shown to be cyclic in Kuroda (1965) and Kuno (1973); and for the cyclicity of Subject Honorification, see the argument in Harada (1976). There is, however, one aspect of the prediction by the Cyclicity Law that seems correct and must be somehow captured in an adequate account of rule ordering; rules of the above-mentioned type do not seem to precede rules that alter the termhood, within the same cyclic domain.

Let us then state this generalization as a separate ordering principle. But before doing so, let us introduce some terminology to simplify our exposition. Suppose we classify the syntactic rules into the following three categories, on the basis of their relation to relational information:

(2) a. Transrelational rules:

rules that assign a grammatical relation to a different term than it was assigned to in the input structure

b. Relatio-structural rules:

rules that refer to grammatical relations but do not change the term arrangement

c. Trans-structural rules:

rules whose effect is to change the linear arrangement of constituents by movement, deletion, addition, or substitution.

* There are of course controversial cases. For example, Cyclicity Law predicts Wh-movement to be postcyclic, because it simply reorders a wh-phrase to the sentence-initial ("complementizer") position. There are however, arguments that Wh-movement is cyclic. Cf. Bresnan (1971), Chomsky (1973). The latter contains a suggestion that the rule may, after all, be postcyclic.

Given this trichotomy we can formulate the following ordering principle:

- (3) Relatio-structural rules are ordered after all the transrelational rules in the cycle; in order words, they apply cycle-finally.

By the nature of this hypothesis we cannot 'prove' its correctness; all we can do is to motivate it by showing that it serves to eliminate otherwise required extrinsic ordering statements. Specifically, we will show that Reflexivization, Number Agreement (in English), Case Marking (in Japanese), and Subject Honorification all follow such typical transrelational rules as Passivization.

Reflexivization in English and Japanese

Consider first Reflexivization in English and Japanese. There is a dispute over whether Reflexivization is a syntactic rule or an interpretive rule, but the choice is irrelevant to the present discussion. Whichever turns out to be the case, the rule is subject to a condition that the antecedent of the reflexive pronoun must be a term of grammatical relation. In English, all three terms (subject, direct object, and indirect object) are possible antecedents; in Japanese, only the subject is.

Now observe the following:

- (4) a. Bill spoke to Sue about himself.
b. Bill spoke to Sue about herself.
c. *Sue was spoken to ___ by Bill about himself.
d. Sue was spoken to ___ by Bill about herself.
- (5) a. Taroo ga Hanako o zibun no heya de kanbyoo-sita.
'Taro nursed Hanako in his room.'
b. Hanako ga Taroo ni zibun no heya de kanbyoo-sareta.
'Hanako was nursed by Taro in her room.'

In either case the underlying subject is prevented from serving as the antecedent if the sentence has been passivized. This follows automatically from the relational constraints on Reflexivization, providing that Reflexivization is stipulated to follow Passivization; the latter would then put the underlying subject en chomage and exclude it from the set of possible antecedents. But this ordering is exactly what is predicted by the principle in (3).

Equi as a Relatio-structural Rule

A similar restriction was observed by Perlmutter (lecture in Tokyo, 1973) concerning the ordering relation between Equi and Passivization.

- (6) a. Bill spoke to Sue about ___ protecting himself.
b. Bill spoke to Sue about ___ protecting herself.
c. *Sue was spoken to by Bill about ___ protecting himself.
d. Sue was spoken to by Bill about ___ protecting herself.

As in the case of Reflexivization, the controller of Equi is confined to terms by a universal principle in the framework of RG; given this restriction the

ungrammaticality of the version of (6b) in which the agent phrase controls Equi will follow if Equi is ordered after Passive. The prior application of Passive put the former subject en chomage and the ex-subject therefore cannot be a possible controller. It would be nice if we could subsume this case under the general principle (3). It is quite tempting to claim that Equi is actually a relatio-structural rule (though Perlmutter and Postal consider it to be a rule affecting termhood).

Number Agreement in English

Consider next the rules of Number Agreement (NA) in English. Here too, we have evidence that the rule is a cyclic relatio-structural rule that must follow the relevant transrelational rules. As I have already discussed this topic in some detail in Harada (1974), I will just give a brief outline of the arguments here. The cyclicity of NA is shown by the following paradigm:

- (7) a. Growling lions are dangerous and flying planes is fun.
 b. Growling lions and flying planes are dangerous and is fun, respectively.
 c. *Growling lions and flying planes are dangerous and are fun, respectively.
- (8) a. John loves smoking and Mary hates it.
 b. *John and Mary loves smoking and hates it, respectively.
 c. John and Mary love smoking and hate it, respectively.

(7) shows that NA must apply before the respectively-transformation (which I identify with Conjunction Reduction), and (8) shows that the latter rule must precede the former. Since this fits the pattern of well-known "sandwich argument", we can conclude that both rules are cyclic; in fact it is obvious that NA must follow Conjunction Reduction within the same cycle.

The following examples show that NA in fact applies to the output of Passivization, Subject Raising, Tough Movement, Conjunct Movement, and Quantifier Float.

- (9) a. You have/*has been ordered by the doctor to take aspirins.
 b. The Mets are/*is unlikely to win the pennant this year.
 c. You were/*was hard to find.
 d. Localistic theory is/*are similar to case grammar.
 e. The boys each bring/*brings a gift to the party.

On the other hand, the following examples indicate that NA must be ordered before such rules as Wh-movement (both in questions and in relative clauses), Subject-Auxiliary Inversion, and Sluicing.

- (10) a. Which argument do you suppose provides/*provide the strongest support for the triple trace theory?
 b. The information which you assume is/*are in the Encyclopedia of Linguistics is actually contained in the Encyclopedia of Philosophy.

- c. Neither do/*does they want to repeat the same error.
- d. It's obvious that some of the assumptions of the theory are wrong, but which assumptions isn't/*aren't clear.

In other words, NA must be constrained in such a way as to follow all the transrelational rules with which it interacts but precede all the trans-structural rules with which it interacts. But this is precisely what is predicted by the ordering principle (3).

Case Marking In Japanese

Let us turn our attention to Case Marking in Japanese. This rule (or possibly, set of rules) is clearly a relatio-structural rule, since its function is to assign morphological material (rather than change grammatical relations) on the basis of relational information. The question then is whether the rule must be constrained to follow all the relevant transrelational rules in the cycle.

Kuno (1973) discusses what might appear at first glance an outright counterexample to the prediction by the principle (3); namely, he argues that one of his case marking rules, Indirect Object Marking, must precede Passivization (his Pure Passive Formation). Since this ordering, if correct, would lead to a disastrous consequence for our proposal, let us examine Kuno's argument in considerable detail.

Kuno assumes the following ordered set of transformations:

(11) a. Indirect Object Marking

Attach ni to the second of three unmarked NP's.

[See below for Kuno's definition of "unmarked NP".]

b. Pure Passive Formation [= our Passivization]

Place the direct object or dative object NP in subject position, and place the original subject NP after it with ni (yotte) attached.

c. Subject Marking

Attach ga to the subject NP. [Where "subject NP" is defined as the first unmarked NP in a clause.]

d. Object Marking

If the matrix verb is [-stative], attach o to the first unmarked nonsubject NP to the left of the verb. If the matrix verb is [+stative], attach ga to the first unmarked nonsubject NP to the left of the verb. In the latter case, the transformation is optional if the object is already followed by o.

e. Ga/O Deletion

Delete ga and o if they are followed by some other particle.

Kuno's definition of "unmarked NP" is as follows:

- (12) An NP is unmarked if it is not followed by any particle or if it is followed by o or ga.

It should then be clear that, although Kuno speaks of such relationally-looking notions as 'subject', 'object', and 'indirect object', he actually uses them as mere mnemonic names for the first, last, and middle 'unmarked' NP, respectively. Hence in Kuno's system, Indirect Object Marking must be applied before Passivization reorders the three NPs in structures like the following.

(13) [John]_{NP} [Mary]_{NP} [kunsyoo]_{NP} atae-ta.

Passivization may reorder either the second or last NP. Consider the latter case first. If Indirect Object Marking has not been applied, the movement of the last NP to the initial position will have the effect of converting the indirect object to a direct object:

(14) Kunsyoo John-ni Mary atae-rare-ta. (from (13))

To this structure Indirect Object Marking does not apply; later case marking rules will then apply to yield an ungrammatical output:

(15) *Kunsyoo ga John ni Mary o atae-rare-ta.

Therefore, argues Kuno, Indirect Object Marking must apply before Passivization. The derivation would appear as follows:

- (16) a. John Mary kunsyoo atae-ta. (= (13); underlying structure)
 b. John Mary-ni kunsyoo atae-ta. (by Indirect Object Marking)
 c. Kunsyoo John-ni Mary-ni atae-rare-ta. (Passivization on last NP)
 d. Kunsyoo-ga John-ni Mary-ni atae-rare-ta. (by Subject Marking)

It can be easily seen from this review that Kuno's argument for the ordering of Indirect Object Marking before Passivization essentially depends on his assumption that grammatical relations are positionally defined in conjunction with the quite dubious notion of 'unmarked NP'. In the framework of RG, however, the application of Passivization on the last NP in (13) does not have any such fortuitous side effect as converting an indirect object to a direct object, since grammatical relations are given in underlying structure and are preserved through a derivation unless altered by rules or principles. Thus, such sentences as (15) never arise from the underlying structure (13) in RG, and there is therefore no motivation for the ordering of Indirect Object Marking before Passivization in this framework.

It should also be pointed out that Kuno's ordering is not only unnecessary but also leads to unmotivated complexities in the grammar. To see this, we need only consider the other derivation from (13) in which Passivization is applied, this time to the indirect object. The initial lines of this derivation are identical to (16a, b). But a host of otherwise unmotivated additions are required to continue this derivation up to the target surface structure, which is (17).

(17) Mary ga John ni kunsyoo o atae-rare-ta.

'Mary was given a medal by John.'

Consider the structure in (16b). Passivization is permitted to apply to this structure to put the NP "Mary-ni" in the sentence-initial position, yielding (18).

(18) Mary-ni John-ni kunsyoo atae-rare-ta.

Since Kuno defines 'subject' as the first unmarked NP in a clause, and since NPs marked with ni are not considered 'unmarked', application of Subject Marking will result only in the structure (19) and never in the desired structure (17).

(19) ?Mary ni John ni kunsyoo ga atae-rare-ta.

One way to cope with this problem is to stipulate that NPs with the particle ni are considered 'unmarked'. This will allow the assignment of ga to the NP "Mary" in (18) to produce (20):

(20) Mary-ni-ga John-ni kunsyoo atae-rare-ta.

But this modification, quite ad hoc in itself, must be supplemented by yet another ad hoc extension of the grammar. Note that the particle ni that appears in front of ga must be somehow erased, but there is no independently motivated rule to delete ni in this environment. In general, ni does not delete in front of other particles:

(21) a. Taroo wa Hanako ni wa purezento o yatta.

'To Hanako, Taro gave a present.'

b. *Taroo wa Hanako wa purezento o yatta.

(22) a. Taroo wa keisatu ni wa hontoo no koto o itta.

'To the police, Taro told the truth. ;

b. *Taroo wa keisatu wa hontoo no koto o itta.

As such, if one postulates a rule that deletes ni in front of ga in (20), the rule will be quite unique.

These considerations thus indicate, quite contrary to Kuno's contention, that the rule of Indirect Object Marking must follow Passivization. If we accept this ordering then none of the ad hoc extensions mentioned above are needed. But this is exactly the ordering required by our ordering principle (3) above. We can thus conclude that the case marking phenomena in Japanese do not present counterevidence for our proposal but rather support it.

Subject Honorification

Let us finally look briefly at Subject Honorification. In the first section of this paper we have already given an example that shows this rule applies to the output of Predicate Raising, which we argued is a transrelational rule. The example is repeated here for convenience.

(23) Tanaka sensei wa seito ni takusan no hon o o-yom-ase ni naru.

'Prof. Tanaka has his students read a lot of books.'

The following examples show that Subject Honorification is applied to the output of Passivization:

(24) a. Yamada sensei wa sono monooto ni o-nayamas-are ni natta.

'Prof. Yamada was annoyed by that noise.'

- (24) b. Yamada sensei wa Sibuya de yakuza ni o-nagur-are ni natta.
'Prof. Yamada was clobbered by rogues in Shibuya.'

Compare also the following minimal pair:

- (25) a. Yamada sensei wa Taroo o o-home ni natta.
'Professor Yamada spoke highly of Taro.'
b. *Taroo wa Yamada sensei no o-home ni nar-are-ta.
'Taro was spoken highly of by Professor Yamada.'

The latter sentence indicates that Passivization must somehow be constrained so as not to apply to the output of Subject Honorification. But such a restriction is simply an automatic consequence of the ordering principle (3). Thus Subject Honorification falls neatly within our rule system.

Concluding Remarks

We have attempted to show that the ordering principle (3) makes the correct prediction about the ordering relations that exist between the known instances of relatio-structural rules and the transrelational rules. Although this is in no way sufficient for the demonstration that that principle is correct, it seems that we have succeeded in motivating further investigation of the validity of that principle.

It should be emphasized that the ordering principle (3), if correct, would greatly reduce the burden on language-learning children. Specifically, the principle gets rid of the necessity of looking for the crucial examples that linguists print in their textbooks to establish an ordering between a given pair of rules. If the ordering principle (3) is psychologically real, it will tell the language-learning child the correct order in which to apply the rules which he is going to internalize.

Appendix I

In the first section of this paper I argued that English has a set of re-assessment rules, which do not change dependency relations but alter the grammatical relations by reassessing the predicate territory with which the grammatical relations are established, and discussed some passive facts to motivate those rules. In the present appendix, I will discuss one well-known puzzling fact about Tough Movement sentences and suggest that re-assessment may be involved here too as a key to the explanation.

Consider the following sentences.

- (1) a. Sonatas are easy to play ___ on this violin.
b. This violin is easy to play sonatas on ___.

There are basically two theories concerning the derivation of such sentences. One theory takes these sentences to derive from the same source, which also underlie the following:

- (2) To play sonatas on this violin is easy.

The other theory regards the subject in (1) to originate in underlying structure; thus according to this theory the two sentences in (1) are derived from two distinct underlying structures, but the difference lies solely in the choice of the underlying matrix subject.

Now consider the following additional sentences:

- (3) a. What violin are these sonatas easy to play on?
b. *What sonatas is this violin easy to play on?

Mysteriously, (3b) is ungrammatical. The ungrammaticality of such sentences as (3b) has defied account in traditional frameworks, and a recent proposal by Chomsky (to appear) is likewise ad hoc. He proposes that the sentences in (1) are derived from the following structures.

- (4) a. Sonatas are easy [_S COMP PRO to play which] on this violin
b. This violin is easy [_S COMP PRO to play sonatas on which]

Chomsky argues that the facts in (3) automatically ensue given these structures, by virtue of the wh-island constraint, which prohibits extraction of two wh-phrases from the same clause. But the structure in (4a) is not given any independent motivation at all.

These facts, however, receive a natural explanation in the framework of RG. To be more precise, I should say that if such sentences as (1b) are generable at all, then such sentences as (3b) are automatically blocked in the framework of RG. This may sound paradoxical to the reader who is aware of the fact that such sentences as (1b) are themselves problematic in the framework of RG. But I will demonstrate that the solution to this problem in terms of reassessment will also provide a solution to the ungrammaticality of (4b).

The RG version of Tough Movement is an ascension rule that raises a direct object of a subject complement to the matrix subject. Thus, from the underlying structure of the form (2), we can raise "sonatas" to matrix subject, placing all the rest of the subject complement after the predicate "is easy". In order to generate (1b), however, we must first convert the NP

"this violin" into a direct object; otherwise it cannot be raised by Tough Movement. To do so, we would have to have a reassessment rule that reassesses the chunk "play sonatas on" as a single predicate territory, so that the NP "this violin" is then redefined as the direct object of the territory "play sonatas on".

Once this reassessment is made, however, there is no possibility of extracting an element from the territory that arose through reassessment, because the derived territory forms an island. Hence we cannot derive (3b), since this would involve extraction of an NP from the reassessed territory.

Note in passing that the relevant reassessment rule cannot simply incorporate "on" into the verb "play". If this had been the case, there would have to be an accompanying change in surface word order. Lack of such a change in word order argues against this possibility, and in fact such a possibility is excluded in principle in the framework of RG. Suppose that reassessment just incorporated "on" into "play". Then the derived relational structure would involve a violation of the Functional Uniqueness Principle, because it would contain two direct objects, "sonatas" and "this violin", for the same verb "play on".

Thus in the framework of RG, derivation of (1b) involves reassessment of the chunk "play sonatas on" as a single predicate territory, and this automatically excludes the possibility of later extraction of elements out of this territory. On the other hand, (1a) is generated without involving reassessment, and therefore extraction of the NP in the prepositional phrase is freely permitted.

Appendix II: Counter Equi, Predicate Raising, and Object Honorification
in Japanese — A rejoinder to Shibatani (1975-76)

1. In Japanese, Equi NP Deletion is applied not only in the usual way in which the complement subject is deleted under identity with a matrix NP ("straight" Equi) but also in the opposite way, deleting the matrix NP instead of the complement subject ("counter Equi). The existence of the latter mode of application has been shown with respect to two constructions: tokoro-complement sentences (Harada 1973) and transitive o-causatives (Kuroda 1965; see also Harada 1973). I have argued (Harada 1973) that Equi is a "peeking" rule and decides its mode of application considering the effect on surface structure: it applies in the straight fashion except in cases where that leads to a violation of the Double-O Constraint (DOC). Thus, Equi applies to the structure in (1) in the Counter Equi fashion, since the application of the Straight Equi results in a violation of DOC (2b).

(1) Kyoozyu-ga gakusei-o [_S gakusei-ni ronbun -o kak-] sase-ta

(2) a. Kyoozyu ga gakusei ni ronbun o kak-ase-ta.

'The professor made the students write a paper.'

b. *Kyoozyu ga gakusei o ronbun o kak-ase-ta.

See Harada (1973) for details of the derivation.

2. An objection has recently been raised to this contention by Shibatani (1975-76), who argues that such an analysis makes a false prediction about Object Honorification. He observes that Object Honorification can be triggered by an indirect object (as in (3a)) and an o-causee (as in (3c)), but never by a ni-causee of an intransitive causative (as in (3b)):

(3) a. Boku wa sensei ni hon o o-mise si-ta.

'I showed the teacher the book.'

b. *Boku wa sensei ni o-mat-ase si-ta.

'I had the teacher wait.'

c. Boku wa sensei o o-mat-ase si-ta.

'I made the teacher wait.'

Shibatani generalizes this into the following condition on Object Honorification:

(4) [The] NP that triggers [O]bject [H]onorification must be underlyingly an object. (Shibatani 1975-76: 162)

He argues that given (4), the Counter Equi analysis of transitive o-causatives makes a false prediction that such sentences do not undergo Object Honorification because "in the Counter Equi analysis the surface causee is derived from subject position of the complement sentence" (163). He points out that the following sentences are perfectly all right.

(5) a. Boku wa sensei ni kutu o o-hak-ase si-ta.

(Lit.) 'I caused the teacher to wear the shoes.'

(5) b. Boku wa sensei ni iken o o-kik-ase si-ta.

(Lit.) 'I caused the teacher to hear the opinion.'

Shibatani concludes that the Counter Equi analysis is wrong, and proposes an alternative analysis, called the 'o-ni analysis', in which the surface form (2a) is derived through an ungrammatical intermediate form (2b) by a particle adjustment transformation that changes the particle o to ni when it precedes another o-phrase.

3. If we examine Shibatani's arguments more closely, however, it will immediately become apparent that he makes some assumptions about rule ordering that he does not justify, and this has led him to the conclusions which in fact do not follow from his observations.

This is most clearly demonstrated by a consideration of the ordering relation between Counter Equi and Object Honorification. Shibatani assumes that Counter Equi precedes Object Honorification, which is obvious from the following quotation:

(6) [The no-phrase in (5a) and (5b)] is not an underlying object, as the underlying object in the matrix sentence is deleted by Counter Equi. Thus, in the Counter Equi analysis, [the ni-phrase in (5a) and (5b)] fails to trigger Object Honorification. (163)

But no justification is offered for this ordering. In fact, there is evidence to the contrary. If Counter Equi applied before Object Honorification, the latter rule would never be applicable to tokoro-complement sentences, for exactly the same reason that it fails to apply in the derivation of transitive o-causatives. This is not the case, however.

(7) Taroo wa sensei ga obore-soo ni natta tokoro o o-tasuke si-ta.

'Taro saved the professor when he was about to be drowned.'

In order to account for such sentences as (7), we must apply Object Honorification before Counter Equi. Notice, however, that given this ordering there is no way to prevent Object Honorification from applying to the structures in (1), even if the condition (4) is imposed on this rule. Thus, sentences like (5) are perfectly generable in the Counter Equi analysis. This shows that the Counter Equi analysis and the counteranalysis Shibatani proposes are mere notational variants as far as sentences like (5) are concerned, and if so, the Counter Equi analysis is to be preferred because it dispenses with an ad hoc rule of o-ni conversion.

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