

JAPANESE TOPICALIZATION:
A LEXICALIST DEPENDENCY ANALYSIS¹

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I. INTRODUCTION

This paper presents an analysis of a range of Japanese constructions which include constituents marked with the postposition "wa". The constructions have been studied previously independent of linguistic theories by Mikami (1960), Onoe (1981) and Teramura (1991) among others. These studies present valuable data for more theory-dependent analyses. The theory dependent studies are of two groups: multistratal multi-bar analyses and monostratal one-bar analyses. The former type of analyses, represented by Kuno (1973), Kuroda (1965, 1987), and Saito (1985, 1987) among others, capture topicalization in terms of two operations: wa-attachment and the movement of the item to which the postposition "wa" has been attached. Consequently, the two adjunction sites: the locus of wa-attachment and the destination of the movement became the major issue. The issue remains yet unresolved. These studies offer us an insight on the notion of gaps and its relevance to syntactic analysis.

The monostratal one-bar analyses as represented by Kitagawa (1982) captures the relation between a topic and a lexical gap and attempts to formalize the insights obtained by way of a pragmatic topic binding coupled with his evaluation process applied in the propositional argument structure. Drawing on his basic insight on the relation between a topic and a lexical gap, I will present an alternative analysis. The analysis offered is syntactically anchored, more constrained, and more explicit in formalism. It is based on a case-marking system formulated within a monostratal one-bar dependency grammar of Japanese sentences. It formalizes for the first time linking rules for postposition-marked topicalization.

¹ I am grateful to Dr. Stanley Starosta for his assistance, insightful comments and constructive criticism on this paper.

II. TOPICALIZED SENTENCES IN JAPANESE

In each of the following sentences, the word(s) preceeding the postposition "wa" is a topic:

- (1) Meizin wa sikirini tokei o mita.
Master Tpc constantly watch Acc looked
'The master looked at the watch constantly.'
- (2) Tokyo kara wa isya ga yobareta.
from Tpc doctor Nom summoned
'From Tokyo, the physician was summoned.'
- (3) Kyoo wa zuibun susumimasita.
today Tpc fairly progressed
'Today, (You) made good progress.'
- (4) Kinoo wa Taroo ga hirumesi o tukutta.
yesterday Tpc Nom lunch Acc made
'Yesterday, Taroo made lunch.'
(From: Kitagawa 1982: 192 (38a))
- (5) Zoo wa hana ga nagai.
elephant Tpc trunk Nom long
'Elephants have long trunks; An elephant is such that its trunk is long.'
- (6) Sakana wa tai ga ii.
Fish Tpc red snapper Nom good-is
'Speaking of fish, red snapper is the best.'
(From: Kuno 1973: 250 (18)a)
- (7) Meizin wa Komine ga wakazinisita.
Master Tpc Nom died prematurely
'The master had Komine die prematurely on him.'
- (8) Taroo wa Hanako ga iedesita.
Tpc Nom ran-away-from-home
'Taro had Hanoko ran away from home on him.'
(From: Kitagawa 1982: 175 (3) 'As for Taroo, Hanako ran away from home.')

Among these sentences, (1)-(4) each include a syntactic gap which corresponds to the topicalized word(s):

- 1'. Meizin wa GAP sikirini tokei o mita.
- 2'. Tokyo kara wa isya ga GAP yobareta.
- 3'. Kyoo wa GAP zuibun susumimasita.
- 4'. Kinoo wa GAP Taroo ga hirumesi o tukutta.

Sentences (5) through (8), on the other hand, do not include such a gap. What follows after the postposition wa in (5) through (8) is a complete sentence. The distinction between these two types of topicalized sentences is observed by Kitagawa in terms of two types of targets for his topic binding: anaphoric versus non-anaphoric items (Kitagawa 1982: 186-187). We will take Kitagawa's lexicalist analysis on topic constructions as a point of departure.

III. KITAGAWA'S ANALYSIS

Kitagawa (1982 : 184) assumed that Japanese is not a configurational language, and studied topic

constructions following a model proposed earlier by Hale (1980) and Farmer (1980). Kitagawa defines the topic syntactically as a sister to V. This is indicated in his definition of topic (14a) and (14b), repeated here as (9a) and (9b):

(9a) 'Topic' in Japanese is X'-wa, where X' is [_V];
 (9b) Wa indicates that the immediately preceding X' is outside of the domain of 'evaluation' in terms of the PAS of the nucleus V.

The category PAS is taken from Farmer's 'propositional argument structure'. The PAS "supplies the information regarding the argument requirements of a given verb", with each argument position corresponding "to a thematic relation" (Farmer 1980: 88, quoted in Kitagawa 1982: 183). Kitagawa further assumes that the parsing strategy for topic structure assignment is called for at the pragmatic level, following Dik's suggestion that assignment of topic function operates on the output of the assignment of syntactic and semantic function (Kitagawa 1982: 184). Based on these assumptions, Kitagawa proposes that the structure of a topic construction is in accordance with the schema (10), with the accompanying well-formedness condition (11):

(10) [Top X'-wa] [Pred X'* V] (=Kitagawa's (15))

(11) Topic Binding

The Topic X' must be bound pragmatically to an X' which is in the domain of Predication (Pred)
 (=Kitagawa's (16))

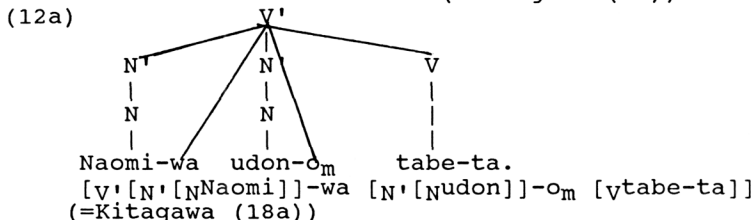
Kitagawa's formulation of the Predication or Pred in (10) follows Hale's formulation for the Japanese instantiation of endocentric X-bar schema, X' --> X'* X. Hale's schema asserts that each phrasal category has a single level of structure and that each is nucleus-final. Therefore, in (10) Kitagawa assumes that the nucleus, or head, which is represented as V may be preceded by any number of complements (including none). Hale interprets the symbol X in the schema as a node-marker, devoid of categorial content but associated with an exponent indicating the level of structure (zero for the terminal, or lexical, level and one bar for the phrasal level) (Hale 1980 : 185). Categorial content is given to the terminal and phrasal nodes by lexical insertion. The categorial features associated with lexical items (inserted at the terminal nodes, (X)) are projected to the phrasal level (X'), so that after lexical insertion, V is dominated by V', N by N', P by P', and so on (Hale 1980: 186).

Topic Binding (11) as a process of pragmatic evaluation is achieved in terms of co-indexing at the level of topic structure assignment (9a). According to

Kitagawa, this evaluation then insures that the topic X' is linked to an X' that is semantically anchored in the PAS of the nucleus V. This framework of analysis will enable each specific analysis of topic constructions to be presented as a triplet composed of: (1) the surface string of overt arguments with semantic evaluation completed in terms of the PAS; (ii) the PAS with evaluation completed; and (iii) the topic structure assignment with pragmatic evaluation completed by means of Topic Binding.

Let us examine Kitagawa's 'topic binding' using his analysis of example (17), repeated here as (12). In the following I have constructed trees for his (18a) and (18c) under (12a) and (12c). His (18b) is repeated here as (12b).

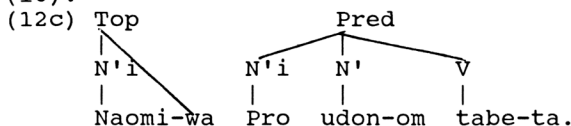
- (12) Naomi-wa udon-o tabe-ta.
 top noodle-acc eat-past
 'Naomi ate udon noodles.' (=Kitagawa (17))



The subscript 'm' attached to the accusative marker 'o' in (12c) shows that O argument in the propositional argument structure, (12b), is evaluated by the overt NP 'udon-o', or 'noodle-acc'.

(12b) PAS: (GA O_m tabe-) (=Kitagawa (18b))

The subscript 'm' attached to O-argument in propositional argument structure (12b) indicates that the semantic evaluation was completed for this argument. The GA-argument in the same propositional argument structure remains unevaluated, since 'wa' in 'Naomi-wa' indicates that Naomi is outside of the domain of semantic evaluation, as specified in the definition of the topic as a sister to V by Kitagawa in (10).



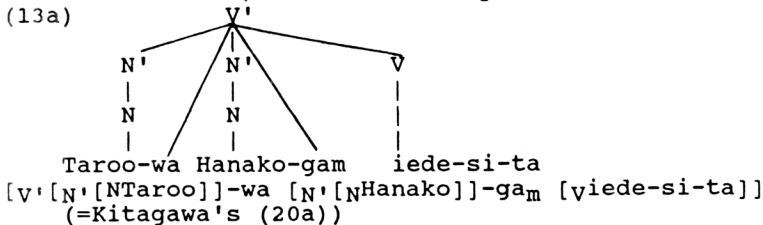
[Top [N' i Naomi] -wa] [Pred [N' i Pro] [N' udon] -o [v tabe-ta]]
 (=Kitagawa (18c))

The pairing (12a) and (12b) show that the O argument position in the PAS is evaluated by the overt NP udon-o 'noodle-acc', while the GA argument position remains

unevaluated. Hence, the unevaluated GA argument in the pairing (12a) and (12b) is interpreted as a pronoun, as specified by Farmer (p. 205). Kitagawa assumes that at the level of topic structure assignment, this presumed pronoun (with null phonetic matrix) may have its representation, Pro, to participate in the operation required for the satisfaction of Topic Binding: as presented by the subscript *i* on N's in (12c).

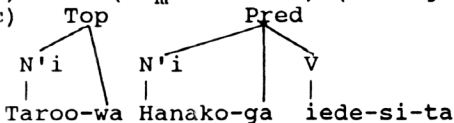
For topicalized sentence without a gap such as (8), repeated here as (13), his analysis goes as follows:

- (13) Taroo-wa Hanako-ga iede-sita
 top nom leave-home-do-past
 'As for Taro, Hanako ran away from home.'



The tree (13a) is constructed on Kitagawa's (20a) where the subscript 'm' attached to the nominative marker 'ga' indicates that the semantic evaluation is completed for this argument in the propositional argument structure (13b) below.

- (13b) PAS: (GA_m iede-si-) (=Kitagawa's (20b))
 (13c)



The tree (13c) is constructed on Kitagawa's (20c), the topic structure assignment with pragmatic evaluation completed by means of Topic Binding:

- [Top [N'i [Taroo]]-wa] [Pred [N'i [Hanako]]-ga] [viede-si-ta]] (=Kitagawa's (20c))

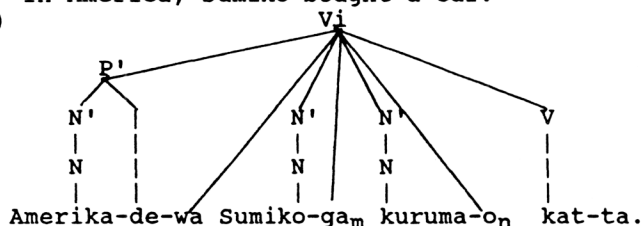
Kitagawa claims that the pairing of (13a) and (13b) shows that the semantic evaluation is complete with an unevaluated overt NP Taroo left over. The subscripts 'm' for the nominative postposition "ga" in the pair indicate this. The sentence will be deemed unacceptable unless this semantically unevaluated overt argument Taroo is 'evaluated' pragmatically at the level of topic structure assignment. Topic binding, as shown in (13c), is thus the only way for this particular sentence to be judged well-formed. With topic Binding connecting Taroo and Hanako, what (13c) says is that Taro's and Hanako's identities are

somewhat closely related to each other. Kitagawa justifies the coindexing identified by the letter 'i' after the nodes dominating Taroo and Hanako in (13c) as 'intrinsic connection' based on a pragmatic linking operation based on the real world knowledge of the speech act participants (Kitagawa 1981: 186).

Topicalization of postpositional phrase as in (2) will be analyzed following Kitagawa's formulation on a similar sentence, his (33) presented here as (14):

- (14) Amerika-de-wa Sumiko-ga kuruma-o kat-ta.
 at-top nom car-acc buy-past
 'In America, Sumiko bought a car.'

(14a)



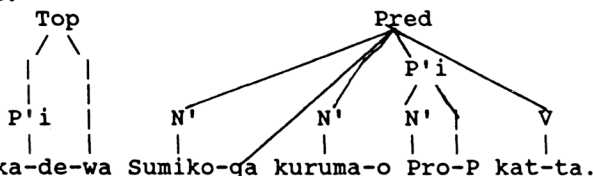
The tree (14a) is constructed on Kitagawa's (34a):

[v' [p' [N' [N Amerika]] -de] -wa [N' [N Sumiko]] -ga_m [N' [N kuruma]] -on [v kat-ta]]

(14b) PAS: (GA_m O_n DE kaw-) (=Kitagawa's (34b))

"DE" in the propositional argument structure refers to a postposition which marks the location where an action takes place.

(14c)



The tree is constructed from Kitagawa's (34c):
 [Top [p'i [Amerika-de] -wa] [Pred [N' Sumiko] -ga [N' kuruma] o [p'i [N' Pro] -P] [v kat-ta]]

There is a change of the category symbol for 'Amerika' in (14a) and (14c). In the (14a) it is an N', while in (14c) it is given the status of a P'. Kitagawa assumes that in topic binding, nominative and accusative P's are understood as N's, or nominative and accusative postpositions are invisible to topic binding while other postpositions such as 'de' in 'Amerika-de' are never invisible to topic-binding (Kitagawa 1981: 191). In (14c) a semantically unevaluated argument is projected as Pro. (14c) is identical to topicalization of NP, such as (12), except that the topicalized item X'-de, is identified as P'.

Aside from some reservations about whether this particular P' should be included in the PAS as proposed here, Kitagawa's Topic Binding operation, by way of pragmatic evaluation on syntactic and semantic output, seems to be plausible so far.

However, the Topic Binding operation proposed by Kitagawa falls short on sentences which include an adverbial gap, such as (3) and (4). This is due to the fact that Farmer's PAS reflects essentially strict subcategorization features of a verb expressed in terms of case array characteristics, and thus does not include elements which would not appear as sisters of the verb in an X' analysis. Recognizing this fact, Kitagawa must somehow provide a way to incorporate a Pro even when the PAS, (15b), itself precludes this. Sentence (4) is repeated here as (15):

(15) Kinoo-wa Taroo-ga hirumesi-o tukut-ta.
 top nom lunch-acc made-past

'Yesterday, Taroo fixed lunch.'

(15a) [v'[_X'Kinoo] [_N'[_NTaroo]-ga_m [_N'[_Nhirumesi]]-o_n [vtukut-ta]] (=Kitagawa's (39a))

(15b) PAS: (GA_m O_n tukur-) (=Kitagawa's (39b))

In (15a) and (15c), the subscripts 'm' and 'n' indicate that the semantic evaluation is completed. Since there is no unevaluated argument position left in (15b), Kitagawa cannot project Pro here. Notice also that PAS as formulated in (15b) excludes all elements which do not appear as a sister to the verb, 'tukur-', e.g. temporal adverbial, 'kinoo' in (15a). Nonetheless, Kitagawa must obtain (15c) in order to complete his topic binding:

(15c) [Top[_X'ikinoo]-wa] [Pred[_X'iPro] [_N'Taroo]-ga
 [_N'hirumesi]-o [vtukut-ta]] (=Kitagawa's (39c))

At this point, Kitagawa has no alternative but to stipulate a lengthy convention (41), in order to obtain (15c) which allows the Predication to include Pro which replaces adverbials by way of identity established by 'i' for the category X'. Kitagawa's convention (41) goes as follows: "If, along with a sentence P

containing a topic phrase A-wa, there exists a well-formed sentence P' with the following properties:

- (i) A-wa in P corresponds to A' in P';
 - (ii) A' is neither 'topic' (i.e., not immediately followed by wa) nor is it semantically evaluated in terms of the PAS associated with P'; and
 - (iii) P' is identical to P in all other respects,
- then, at the level of topic structure assignment, the presence of Pro may be assumed in the Predication of P, corresponding to A' of P'."

In the remainder of this paper, I will present an alternative analysis which is basically similar to

Kitagawa's in concept, but more direct, constrained, and explicit. The analysis is based on a lexicon-driven case-marking system formulated within the lexibase version of dependency grammar.² It is based on the general system of dependency grammar linking rules presented in Starosta's lecture on Formosan languages at Chulalongkorn University in June 1990 (Starosta 1990). This paper formalizes for the first time linking rules for postposition-marked topicalization.

IV. A LEXICALIST DEPENDENCY ANALYSIS

A. Case marking in Japanese

In a lexibase analysis, there are five case relations ('thematic relations') in the Japanese language: PAT, AGT, COR, LOC and MNS. Since Japanese is an accusative language, the AGT of transitive verbs and PAT of intransitive verbs are grammatical subjects. A grammatical subject in Japanese is a NP marked by the [+Nom] case form, which is realized by the postposition 'ga'. The 'direct object', the PAT of transitive verbs, is marked by the [+Acc] case form, which is realized by the postposition 'o'. COR is represented typically by the postposition 'ni', LOC by 'kara', 'ni' and 'de' among others, and MNS by 'de'. As can be seen from this sketch of the case-marking system, Japanese does not observe biuniqueness between case relations and case-marking postpositions. The topic marking postposition 'wa' differs from the others just mentioned in that as a modal postposition, it does not mark the presence of case relations.³

B. Regent and Dependents

A dependency representation is a network of directed dependency relations between pairs of words, where one of the words in each pair is the dominant member of the relation, the regent, and the other is subordinate, the dependent. In determining the pairwise dependency relations that hold between individual words in a sentence, we distinguish between dependents which are complements and dependents which are adjuncts: the former subcategorize their regents while the latter do not. We label such dependency relations in the contextual features marked on the regent, the lexical head of the construction.

C. Semantic Interpretation by index copying

2 For information on lexibase, see Starosta 1990 and 1988, Starosta and Springer 1986 and references cited here.

3 For a near complete localistic analysis of Japanese postpositions, see Lee 1989.

The formal establishment of dependency links and the semantic interpretation of the resulting dependency representations are accomplished by index copying, which is implemented by two types of rules: Linking Rules and Chaining Rules. The linking rules apply between words and their immediate dependents. The chaining rules, on the other hand, apply between words in different dependency domains. Examples of linking rules relevant to our analysis are given below:

LR-1-0a. Structural linking (exocentric)

```

|?[+Wci]| --> [n[+Wci]] / |+Wci |
|+Wcj |      |nnindex|

```

This rule says a word of class WCj which requires a dependent of word class Wci takes on the index n of a neighboring word of class Wci, thereby establishing an exocentric dependency link between the two.

LR-1-0b. Structural linking (endocentric)

```

|?([+Wci])| --> [n([+Wci])] / |+Wci |
|+Wcj |      |nnindex|

```

This rule says a word of class WCj which allows a dependent of word class Wci takes on the index n of a neighboring word of class Wci, thereby establishing an endocentric dependency link between the two.

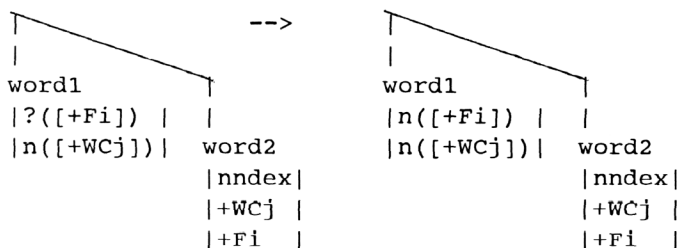
LR-1-1. General valency linking (complements)

```

|?[+Fi] | --> [n[+Fi]] / |+Fi |
|n[+Wcj]|      |nnindex|
|?[+Fi] | --> [n[+Fi]] / |+Fi |
|n([+Wcj])|      |nnindex|

```

These rules say that a word which requires a dependent bearing the feature [+Fi] takes on the index n of a neighboring word of word class WCj bearing the feature [+Fi], thereby associating a grammatical function label 'Fi' with the dependency link obtaining between the two words. The same information can be shown in a binary dependency tree as follows:



Variations follow:

LR-1-2. General adjunct linking

```

|?([+Fi])| --> [n([+Fi])] / |+Fi |
|n([+Wcj])|      |nnindex|

```

This rule is a variation referring to adjuncts.

LR-2. Case form linking

$$[?[+CFi]] \rightarrow [n[+CFi]] / \begin{array}{l} | +CFi | \\ | nindex | \end{array}$$

This rule is a variation referring to case forms.

LR-3. $\begin{array}{l} | n[+CFi] | \\ | ?[+CRj] | \end{array} \rightarrow \begin{array}{l} [m[+CRj]] \\ | m[+N] | \end{array} / \begin{array}{l} | +P | \\ | nindex | \end{array}$

This rule is a variation referring to case relation, which obtains an index from the lower PP. LR-3' is an instantiation of his schema:

LR-3'. Intransitive subject marking

$$\begin{array}{l} | ?[PAT] | \\ | n[+Nom] | \\ | -trns | \end{array} \rightarrow \begin{array}{l} [m[+PAT]] \\ | m[+N] | \\ | nindex | \end{array} / \begin{array}{l} | +P | \\ | nindex | \end{array}$$

LR-4. $\begin{array}{l} | +P | \\ | m[+P] | \\ | ?[+N] | \end{array} \rightarrow [n[+N]] / \begin{array}{l} | +P | \\ | n[+N] | \\ | mindex | \end{array}$

This rule shows that the noun index in a [+P] matrix is obtained from the lower PP.

LR-5. $\begin{array}{l} | q[+CRj] | \\ | ?[+CFi] | \end{array} \rightarrow [m[+CFi]] / \begin{array}{l} | +P | \\ | q[+N] | \\ | m[+P] | \end{array}$

This rule is a variation referring to case form, which gets a postposition index from a lower PP.

LR-6. Transitive actor linking

$$\begin{array}{l} | ?[+actr] | \\ | n[+AGT] | \end{array} \rightarrow [n[+actr]]$$

LR-7. Intransitive actor linking

$$\begin{array}{l} | ?[+actr] | \\ | n[+PAT] | \\ | -trns | \end{array} \rightarrow [n[+actr]]$$

LR-8. A-subject marking

$$\begin{array}{l} | ?[+Nom] | \\ | n[+actr] | \\ | n[+Nom] | \\ | ?[+actr] | \end{array} \rightarrow \begin{array}{l} [n[+Nom]] \\ [n[+actr]] \end{array}$$

LR-9. Acc marking

$$\begin{array}{l} | +trns | \\ | ?[+PAT] | \\ | n[+Acc] | \end{array} \rightarrow \begin{array}{l} [m[+PAT]] \\ | m[+N] | \\ | nindex | \end{array} / \begin{array}{l} | +P | \\ | nindex | \end{array}$$

LR-10a Operator case relation linking (Complements)

$$\begin{array}{l} | n([+prtr]) | \\ | ?[+CRi] | \end{array} \rightarrow [n[+CRi]]$$

LR-10b Operator case relation linking (Adjuncts)

$$\begin{array}{l} | n([+prtr]) | \\ | ?([+CRi]) | \end{array} \rightarrow [n[+CRi]]$$

LR-10c Operator adverbial linking

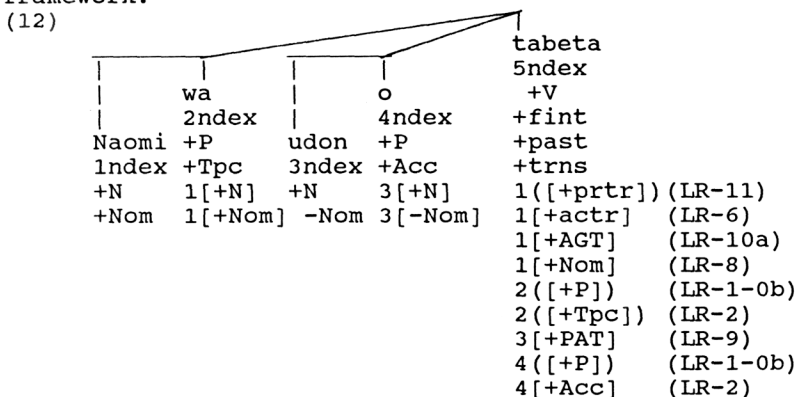
$$\begin{array}{l} | n([+prtr]) | \\ | ?([+ADV]) | \end{array} \rightarrow [n[+CRi]]$$

LR-11. Operator topic linking

|?([+prtr])| --> [n([+prtr]) / |+P |
 |q[+Tpc] | |n[+N]|
 |qndex|

V. Analysis of topicalized sentences

I will illustrate the operation of the linking rules LR-1-0a through LR-11 in the analyses of case-marking and topicalization presented here by giving detailed derivations for sentences 12-15 in the present framework:



'Naomi ate udon-noodle.'

1-2 5 3-4

In (12), [+actr] stands for the macrorole 'actor', which is defined as the PAT of an intransitive verb [+V,-trns] or the AGT of a transitive verb [+V,+trns]. The each word is given a distinctive index and words will be referred to by indices. The pairwise dependency relations are observed in word pairs 1/2 and 3/4 among others. For these two pairs we can apply LR-1-0a which establishes the dependency by copying the index 1 to the features [?(+N)] in 2 as well as by copying the index 3 to the features [?(+N)] in 4. For the same two pairs, by way of LR-1-1, we copy the index 1 to the feature [?(+Nom)] in 2, and the index 3 to the feature [?(+Nom)] in 4. Similarly a pairwise dependency is observed in pairs 2/5 and 4/5. This is noted by indices 2 and 4 copied to the relevant contextual features in 5. The index 2 is copied to [?(+Tpc)] by LR-2 and to [?(+P)] by LR-1-0b. The same two linking rules apply to the two contextual features [?(+Acc)] and [?(+P)], copying the index 4 to these features. We now invoke LR-11, which enable us to copy the index on [+N] in the matrix of postposition 'wa' to the adjunct feature, [?(+prtr)] in the matrix of the regent. This leaves the AGT unindexed, since there is no external [+Nom] dependent for the verb to link to. However,

mediated by the copied index on the adjunct operator [1([+prtr])], we can invoke LR-10a and supply the so far unindexed [?(+AGT)] with the index 1. This copied index on [+AGT], in turn, enables us to copy the same index to [+actr] by way of LR-6. The index copied to [+actr] will serve as an input for LR-8 and complete the process of index copying by assigning the same index, 1, to the feature [?(+Nom)]. Since no obligatory contextual features are left unindexed in the sentence, the sentence is accepted as well-formed.

This example demonstrates how we can capture Kitagawa's basic insight about the relation between a topic and a lexical gap within the framework of a constrained and formal dependency analysis.

(13)

				iedesita
				5index
				+V
				+fint
				+past
				-trns
				1([+prtr]) (LR-11)
				2([+P]) (LR-1-0b)
				2([+Tpc]) (LR-2)
				3[+actr] (LR-7)
				3[+PAT] (LR-3')
				4[+Nom] (LR-2)
				4([+P]) (LR-1-0b)
	wa		ga	
	2index		4index	
Taroo	+P	Hanako	+P	
1index	+Tpc	3index	+Nom	
+N	1[+N]	+N	3[+N]	
-Nom	1[-Nom]	+Nom	3[+Nom]	

'Taroo had Hanako ran away from home.'

1-2 3-4 5

In (13) the pairwise dependency for 1/2 and 3/4 is noted by the index 1 copied to the feature [?(+N)] in 1 and the index 3 copied to the same feature in 4 by LR-1-0a, as well as by the index 1 copied to the feature [?(+Nom)] in 2 and by the index 3 copied to the feature [?(+Nom)] in 4 by LR-1-1. The pairwise dependency between 2/5 is noted by LR-1-0b on the contextual feature [?(+P)] and by LR-2 on [?(+Tpc)]. These rules copy the indices 2 to the two features in the matrix of the regent. The rules LR-1-0b and LR-2 also establish the pairwise dependency between 4/5, copying the index 4 to the features [?(+P)] and [?(+Nom)]. The [?(+prtr)] adjunct feature in the regent copies the index 1 by way of LR-11. LR-3' establishes the link between case form [+Nom] and case relation [+PAT]: by referring to the matrix 4, the index on [+N] in this matrix, namely 3, is copied to the [+PAT]. This copied index on [+PAT] enables us to copy the same index to [+actr] by LR-7. The index copying for the regent is completed, and the well-formedness of the sentence is insured.

In (13) the adjunct feature ([+prtr]) is not linked to any case relation, indicating that the association between the topic and the rest of the sentence is not syntactic, but pragmatic, as concluded by Kitagawa. A full and adequate account of topic constructions, 5-8, will involve pragmatically-based interpretation of the unlinked operator.

The sentence (14) belongs to the same class as sentence (2), which will be analyzed below:

(2)

					yobareta
					6ndex
		wa		ga	+V
		3ndex		5ndex	+fint
	kara	+P	isya	+P	+lctn
	2ndex	+Tpc	4ndex	+Nom	+past
Tokyoo	+P	1[+N]	+N	4[+N]	-trns
1ndex	+lctn	2[+P]	+Nom	4[+Nom]	
+N	1[+N]				1([+prtr]) (LR-11)
-Nom	1[-Nom]				1[+LOC] (LR-10a)
					2[+lctn] (LR-5)
					3([+P]) (LR-1-0b)
					3([+Tpc]) (LR-2)
					4[+actr] (LR-7)
					4[+PAT] (LR-3')
					5([+P]) (LR-1-0b)
					5[+Nom] (LR-2)

'From Tokyo, the physician was summoned.'

2-3 1 4-5 6

The pairwise dependencies are established as follows: between 1 and 2 by LR-1-0a and LR-1-1, copying the index 1 to two features in 2. In 3, the index 2 is copied to the feature [? [+P]] by way of LR-1-0a; while LR-4 applied to the same matrix, 3, will copy the index 1 to the feature [? [+N]]. The pairwise dependency is established between 4 and 5 by LR-1-0a and LR-1-1, copying the index 4 to the features [? [+N]] and [? [+Nom]] respectively in the matrix of the nominative postposition. In the matrix of the regent, by way of LR-2 the index 5 is copied to the feature [? [+Nom]]. The same index is copied to the feature [? [+PAT]] by way of LR-3'. The index 3 is copied to the two contextual features: [? ([+P])] by way of LR-1-0b and [? ([+Tpc])] by way of LR-2. The application of LR-11 copies the 1 to the adjunct feature [? ([+prtr])] . This leaves the feature [? [+LOC]] still unindexed. Invoking LR-10a allows an unindexed case relation to copy the same index from the adjunct operator. This allows us to assign the index 1 to the feature [? [+LOC]]. Since [+LOC] is indexed with 1, we can apply LR-5, which copies the index 2 to the feature [? [+lctn]].

(15)

					tukutta.
					7ndex
					+V
					+fint
					+past
					+trns
					1([+Adv])(LR-10c)
					1([+prtr])(LR-11)
					2([+P])(LR-1-0b)
					2([+Tpc])(LR-2)
					3[+actr](LR-8)
					3[+AGT](LR-6)
					4([+P])(LR-1-0b)
					4[+Nom](LR-2)
					5[+PAT](LR-9)
					6([+P])(LR-1-0b)
					6[+Acc](LR-2)

'Yesterday, Taroo made lunch.'

1-2 3-4 7 5-6

This sentence has an adverbial which is an adjunct. It does not subcategorize verbs; hence the parentheses in the feature $[?([+Adv])]$ in the matrix of the regent verb. This shows that the adjunct feature $[?([+prtr])]$ is workable for linking adjuncts as well as complements.

VI. CONCLUSION

The proposed analysis treats topicalization as an 'operator' dependency relation. The index of the phrasal cohead of the 'wa'-marked constituents is copied to the operator contextual feature in the matrix of the head verb. This index is copied further to some unsatisfied contextual feature in the same matrix, thereby formally marking the association between the 'wa'-constituent and the argument structure of the head verb.

The analysis offered here is similar in general approach to the one proposed by Kitagawa, but is formally more well-defined and simpler and more general. Since we use the contextual features already established, there is no added cost to the grammar. Moreover, most of the linking rules presented here, LR-1-0a, LR-1-0b, LR-1-1, LR-1-2, LR-2, LR-3, and LR-6 through 8, LR-10a, LR-10b, and LR-10c have been motivated crosslinguistically. Other linking rules presented here are independently needed to explain other grammatical phenomena such as postposition stacking (LR-4 and LR-5), intransitive subject marking (LR-3') and Acc marking (LR-9).

The analysis offered here does not provide answers to topicalizations which requires pragmatic

antecedents, e.g. Shinbun o yomitai hito wa koko ni arimasu "As for people who want to read newspaper, here (it) is", but rather consigns such phenomena to a pragmatic analysis.⁴ Because of its constraints, the theory itself draws the line between topicalization which is strictly grammatical and topicalization which requires additional pragmatically conditioned mechanisms.

VII. REFERENCES

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4 Onoe 1981 lists several examples under 'senko' (Onoe 1981: 115). The example cited here, originally found in Mikami (Mikami 1976 (8th ed.) : 82).

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