

A Multi-Modal Combinatory Categorial Grammar Analysis of the -Te Form Complex Predicate in Japanese

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Outline

- Data and problem
- Analysis in Multi-Modal CCG
- Conclusion



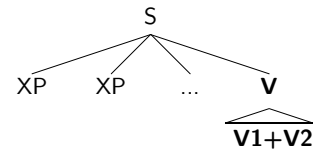
-te form complex predicate in Japanese

- (1) a. **benefactive:**
V-te *morau* ('have somebody V for the benefit of oneself'),
V-te *kureru* ('V for the benefit of the speaker'),
V-te *hosii* ('want somebody to V'), etc.
- b. **modal/aspectual:**
V-te *iru* (progressive),
V-te *oku* (perfect),
V-te *simau* (perfect), etc.
- (2) Mary-wa John-ni piano-o **hii-te morat-ta**.
Mary-TOP John-DAT piano-ACC play-TE BENEF-PAST
'Mary had John play the piano for her.'

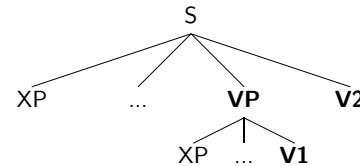


Syntactic structure of the -te form complex predicate?

- (3) a. **complex predicate analysis**



- b. **VP complementation analysis**



The dual nature of the -te form complex predicate

[Shibatani, 1978, McCawley and Momoi, 1986]

| | -te form | CP | VPC |
|--------------------------|----------|----|-----|
| scrambling | ✓ | ✓ | * |
| adverb placement | ✓ | ✓ | * |
| right-node raising | ✓ | ✓ | * |
| postposing | ✓ | ✓ | * |
| cleft | ✓ | ✓ | * |
| coordination | * | ✓ | * |
| focus particle insertion | * | ✓ | * |
| reduplication | * | ✓ | * |

(CP: complex predicate, VPC: VP complementation)

✓: V1 and V2 behave like a lexical unit

*: V1 and V2 do not behave like a lexical unit



Cases where the -te form behaves like complex predicates

- (2) Mary-wa John-ni piano-o **hii-te morat-ta**.
Mary-TOP John-DAT piano-ACC play BENEF-PAST
'Mary had John play the piano for her.'
- (4) a. Mary-wa *piano-o* John-ni **hii-te morat-ta**.
b. *Mary-wa piano-o **hii-te John-ni morat-ta**. (scrambling)
- (5) a. Mary-wa piano-o *yukkuri* John-ni **hii-te morat-ta**.
Mary-TOP piano-ACC slowly John-DAT play-TE BENEF-PAST
'Mary had John play the piano slowly for her.'
- b. *Mary-wa John-ni piano-o **hii-te murini morat-ta**.
Mary-TOP John-DAT piano-ACC play forcibly BENEF-PAST
intended: 'Mary forcibly had John play the piano for her.'
(adverb placement)



Cases where the -te form behaves like complex predicates (cont.)

- (6) a. Mary-wa [John-ni piano-o], [Bill-ni gitaa-o]
Mary-TOP John-DAT piano-ACC Bill-DAT guitar-ACC
hii-te morat-ta.
play-TE BENEFPAST
'Mary had John play the piano and Bill play the guitar for me.'
- b. *Mary-wa [John-ni piano-o **hii-te**], [Bill-ni
Mary-TOP John-DAT piano-ACC play Bill-DAT
huruuto-o **hui-te**] **morat-ta.**
flute-ACC play BENEFPAST
intended: 'Mary had John play the piano and Bill play the flute for her.'

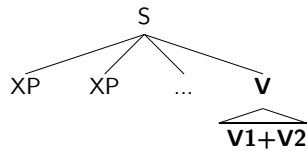
(RNR)

Cases where the -te form behaves like VP complementation

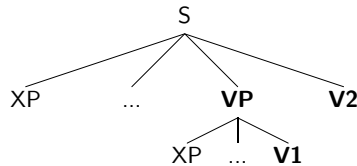
- (7) Mary-wa John-ni [[piano-o **hii-te**] [huruuto-o **hui-te**]]
Mary-TOP John-DAT piano-ACC play flute-ACC play
morat-ta.
BENEFPAST
'Mary had John play the piano and play the flute for her.'
(embedded VP coordination)
- (8) Mary-wa John-ni piano-o **hii-te sae morat-ta.**
Mary-TOP John-DAT piano-ACC play even BENEFPAST
'Mary asked John even the favor of playing the piano for her.'
(focus particle insertion)
- (9) Kimi-ni Tookyoo-ni **it-te hosii** koto wa **hosii** ga, ...
you-DAT Tokyo-LOC go want want but
'I certainly do want you to go to Tokyo, but ...' (reduplication)

Syntactic structure of the -te form complex predicate?

- (3) a. complex predicate analysis



- b. VP complementation analysis



Basic idea of the proposed analysis

Descriptively, V1 and V2 of the -te form complex predicate are put together in a way that is

- **tighter** than the way in which ordinary arguments are combined with the head, but
- **looser** than the way in which elements are combined in the lexicon.

Multi-Modal Combinatory Categorical Grammar

- recognizes different **modes** of syntactic composition.
 - The dual nature of the -te form can be captured by assigning a distinct mode of composition.
 - **Key idea:** The mode for -te form complex predicate formation has an **intermediate** degree of flexibility.
- places much less importance on hierarchical structure than in phrase structure-based theories.
 - Avoids the problem for phrase structure-based accounts.

Multi-Modal Combinatory Categorical Grammar (MMCCG)

[Baldrige, 2002]

- Properties inherited from CCG:
 - type-driven lexicalism
 - flexibility of constituency
 - enables accounts of nonconstituent coordination, traceless extraction, etc.
 - without modality, overgenerates grossly
- **Innovation:** incorporation of '**modal control**' from Type-Logical Grammar [Moortgat, 1996, Oehrle, 1998]
 - enables **systematic control** of the flexibility
 - solves the problem of overgeneration of earlier CCG

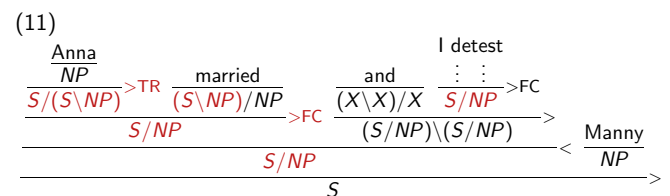
Flexible constituency for non-constituent coordination

[Dowty, 1988]

Type-Raising: $A \vdash B / (B \setminus A)$

Function Composition: $A/B \ B/C \vdash A/C$

- (10) [Anna married] and [I detest] Manny. (right-node raising)



Slash modalities for controlling flexibility

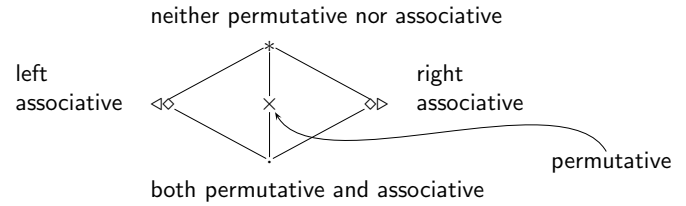
(13) *player_i that [_t; shoots] and [he misses]
(coordinate structure constraint) [Baldrige, 2002, 97]

(14)

$$\frac{\text{that}}{(N \setminus N) / (S \setminus NP)} \frac{\text{shoots}}{S \setminus NP} \frac{\text{and}}{(X \setminus *X) / *X} \frac{\text{he misses}}{NP \ S \setminus NP} \frac{}{S} <$$

$$\frac{}{S \setminus *S} > \text{*** } <FC \text{***}$$


Hierarchy of modes



Combinatory rules with modalities

- (15) Function Application
 - a. $A / *B \ B \vdash A$
 - b. $B \ A \setminus *B \vdash A$
- (16) Function Composition
 - a. $A / \diamond B \ B / \diamond C \vdash A / \diamond C$
 - b. $B \setminus \diamond C \ A \setminus \diamond B \vdash A \setminus \diamond C$
- (17) Type-Raising
 - a. $A \vdash B / i (B \setminus i A)$
 - b. $A \vdash B \setminus i (B / i A)$
- (18) Permutation
 - a. $A / \times B / \times C \$ \vdash A / \times C / \times B \$$
 - b. $A \setminus \times B \setminus \times C \$ \vdash A \setminus \times C \setminus \times B \$$



Lexical entries

- (19) a. Mary-ga: NP_n
 - b. John-ni: NP_d
 - c. piano-o: NP_a
 - d. morat-ta: $S \setminus NP_n \setminus NP_d \setminus \diamond VP$ (V2 of complex predicate)
 - e. yon-de: $VP \setminus NP_a$ (V1 of complex predicate)
- (/ and \ are the abbreviations for / . and \ .)



Scrambling (1)

(4a) Mary-wa *piano-o* John-ni **hii-te morat-ta**.
Mary-TOP piano-ACC John-DAT play BENEf-PAST
'Mary had John play the piano for her.'

(20)

$$\frac{\text{Mary-ga}}{NP_n} \frac{\text{piano-o}}{NP_a} \frac{\text{John-ni}}{NP_d} \frac{\text{hii-te}}{VP \setminus NP_a} \frac{\text{morat-ta}}{S \setminus NP_n \setminus NP_d \setminus \diamond VP} <$$

$$\frac{}{S} <$$


Scrambling (2)

(4b) *Mary-wa piano-o **hii-te John-ni morat-ta**.
Mary-TOP piano-ACC play John-DAT BENEf-PAST
intended: 'Mary had John play the piano for her.'

(21)

$$\frac{\text{John-ni}}{NP_d} \frac{\text{piano-o}}{NP_a} \frac{\text{hii-te}}{VP \setminus NP_a} \frac{\text{morat-ta}}{S \setminus NP_n \setminus NP_d \setminus \diamond VP} <$$

$$\frac{}{S} <$$