Selection and Dynamic Categorization:
A Study of Adjectival Nouns and Verbal Nouns

HOSHI, Hiroto
Akita University

Selection and Dynamic Categorization:
A Study of Adjectival Nouns and Verbal Nouns[1]

HOSHI, Hiroto
Akita University

1. Introduction

Hoshi(2019a-b)proposes a 'dynamic categorization' analysis to capture the nature of fuzzy categories, i.e. adjectival nouns (ANs) and verbal nouns (VNs) in Japanese[2], by adopting the central idea of Dynamic Syntax: that is, underspecified syntactic representation gets updated gradually in the course of left to right parsing of a string of words (Kempson et al. 2001, Cann et al 2005, Kempson 2016, 2017; cf. Hawkins 1990, 1994, 2004, 2014, Phillips 1996, Hoshi 2014, etc.). There, I assume two independent parsers, one for morphology and the other for syntax.

In this paper, I try to improve the proposed dynamic categorization analysis by adopting only one parser for morphology and syntax. At the same time, I attempt to reinforce the argument for the significance of the dynamics of language, suggesting that proposed syntactic categorizers trigger selection twice dynamically in the course of left to right processing of a string of words. Thus, the consequence of earlier selection disappears at a later stage of sentence processing.

2. Selection and Dynamic Categorization (cf. Hoshi 2014, 2019a-b)

Under the proposed analysis of ANs and VNs, Hoshi (2019a-b) first proposes that a Japanese adjectival noun like *suki* 'fond/fondness' is fuzzy in that the category of an AN like *suki* is underspecified with respect to [+A] or [+N] in the lexicon, as shown in (1a).

(1) a.　[$_\text{A or N}$ *suki*]
　　b.　[$_\text{V or N}$ *kenkyuu*]

Similarly, as illustrated in (1b), a verbal noun in Japanese is fuzzy, because the category of a VN like *kenkyuu* 'researching' is also not fixed regarding [+V] or [+N] in the lexicon.

To explain the important properties of Japanese ANs, Hoshi (2019a-b) then proposes the following *dynamic categorization* conditions:

(2) a.　Suffixes such as Case markers may *select* the [+N] feature of the projection of an adjectival noun like [$_\text{A or N}$ *suki*] in syntax, and *dynamically turn* the fuzzy AN projection into an unambiguous [+N] projection in the syntactic component.

　　b.　Copulas may *select* the [+A] feature of the projection of an adjectival noun like [$_\text{A or N}$ *suki*] in syntax, and *dynamically turn* the fuzzy AN projection into an unambiguous [+A] projection in the syntactic component.

That is, in the course of left to right parsing of a string of words in the syntactic component, once a Case marker selects the [+N] feature of the projection of an adjectival noun, the Case particle turns the fuzzy category into an unambiguous [+N] category by means of dynamic categorization condition (2a). On the other hand, when a copula like *da* or *na* selects the [+A] feature of the projection of an adjectival noun, the copula then dynamically turns the ambiguous category into an unambiguous [+A] category due to categorization condition (2b).

Furthermore, to capture the parallelism between the two types of fuzzy categories, i.e. Japanese ANs and VNs, Hoshi (2019a-b) proposes (3a-b) (cf. Hoshi 2014).

(3) a.　Suffixes such as Case markers or aspectual nouns such as -[$_\text{AspN}$ *tyuu*][3] 'middle' may *select* the [+N] feature of a verbal noun like [$_\text{V or N}$ *kenkyuu*] in syntax, and *dynamically turn* the

[2]　See Aarts et al. (2004), Fanselow et al. (2006), Aarts (2007), etc. for some issues on fuzzy grammar. For various treatments of ANs and VNs, the reader is referred to Kuno (1973), Martin (1975), Miyagawa (1987), Grimshaw and Mester (1988), Murasugi (1988), Kuroda (1992), Kageyama (1993), Matsumoto (1996), Uehara (1998), Saito and Hoshi (2000), Croft (2001), Ito and Sugioka (2002), Yumoto (2005), Sugioka (2009), among others.

[3]　Sugioka (2009, p. 92, 27b-d) proposes that the aspectual noun head -[$_\text{AspN}$ *tyuu*] 'middle' can nominalize any part of the projection of a verbal noun through its morphological selection. This insight by Sugioka (2009) is incorporated into dynamic categorization condition (3a).

fuzzy VN projection into an unambiguous [+N] projection in the syntactic component.

b. Verbs such as the light verb *su* 'do' or aspectual nouns such as [AspN *tyuu*] 'middle' may *select* the [+V] feature of the projection of a verbal noun like [V or N *kenkyuu*] in syntax, and *dynamically turn* the fuzzy VN projection into an unambiguous [+V] projection in the syntactic component.

Namely, in the course of left to right processing of words in syntax, once a Case marker selects the [+N] feature of the projection of a verbal noun, the Case marker dynamically turns the underspecified category into an unambiguous [+N] category through condition (3a) (cf. 2a). Once, on the other hand, a verb like the light verb *su* selects the [+V] property of the projection of a VN, it turns the fuzzy category into an unambiguous [+V] category by means of dynamic categorization condition (3b) (cf. 2b).

In short, under the dynamic categorization analysis, adjectival nouns such as *suki* are not simply a [+A] category, are not just a [+N] category, or are not a mixed category of both [+A] and [+N] properties (cf. Martin 1975, Kageyama 1993, Ito and Sugioka 2002, among others). Under the dynamic syntactic analysis, [AN *suki*] 'fond/fondness' is listed as a fuzzy category in the lexicon as in (4a).

(4) a. [A or N *suki*] (= 1a)
    b. [N *suki*]
    c. [A *suki*]

Depending on syntactic environments under the dynamics of language, the adjectival noun *suki* gets updated as noun as in (4b) (see 2a), or gets updated as adjective as in (4c) (see 2b).

In the same way, verbal nouns such as *kenkyuu* 'researching' are not simply a [+V] category, are not just a [+N] category, or are not a dual category of both [+V] and [+N] features (cf. Martin 1975, Kageyama 1993, Ito and Sugioka 2002, Sugioka 2009, among others). Under the dynamic categorization analysis, the verbal noun *kenkyuu* is listed as an underspecified category in the lexicon as in (5a).

(5) a. [V or N *kenkyuu*] (= 1b)
    b. [N *kenkyuu*]
    c. [V *kenkyuu*]

Depending on syntactic contexts, the VN *kenkyuu* is dynamically updated as noun as in (5b) (see 3a), or turned into verb as in (5c) (see 3b).

Given this, let us now consider exactly how the proposed dynamic categorization analysis captures the

nature of ANs and VNs in a uniform way. Consider first the acceptability of (6a-b) below:

(6) a. [ANP anata-no [AN kirei]] -o   ooens -i-masu.[4]
         you –Gen   beauty-Acc support- -Pres
      'We will support your beauty.'

    b. [VNP John-no   nihongo -no [VN kenkyuu]]-ga
           John-Gen Japanese -Gen   research-Nom
      'John's research of Japanese is fantastic.'

      subarasi-i.
      fantastic-Pres

Under the proposed analysis, syntax processes a string of words in (6a), roughly as in (7a-c).

(7) a. ?[AP or NP [NP anata]-?no [A or N kirei]]

    b. ?[AP or NP [NP anata]-?no [A or N kirei]]-o

    c. [NP [NP anata]-no [N kirei]]-o
                    (*dynamic categorization* 2a)

At the initial point of left to right processing of a string of words, the syntactic parser constructs structure (7a). In (7a), the category of the adjectival noun *kirei* is underspecified with respect to [+A] or [+N] (cf. 1a/4a), and thus, the Genitive Case -*no* attached to the NP *anata* is not licensed yet. At the next point of left to right parsing, the Accusative Case marker –*o* first selects the underspecified projection by [A or N *kirei*] (cf. Kageyama 1993, Ito and Sugioka 2002, etc.), and the parser builds the structure in (7b), where the Genitive Case marker –*no* is not yet licensed. As shown in (7c), the Accusative Case marker –*o* then selects the [+N] feature of the projection of the AN *kirei*, and dynamically turns the fuzzy category into the projection of an unambiguous category [+N], due to categorization condition (2a). Consequently, at the processing point of (7c), the Genitive Case –*no* is properly licensed (cf. Saito 1982, among others).

Similarly, syntax parses from left to right a string of words in (6b) as follows:

(8) a. ?[VP or NP [NP John]-?no [NP nihongo] -?no
         [V or N kenkyuu]]

    b. ?[VP or NP [NP John]-?no [NP nihongo] -?no
         [V or N kenkyuu]]-ga

    c. [NP [NP John]-no [NP nihongo] -no
         [N kenkyuu]]-ga (*dynamic categorization* 3a)

At the initial point of left to right parsing, syntax forms structure (8a). In (8a), both the external argument *John*

---

and the internal argument *nihongo* are marked by the Genitive Case marker *–no*. The two Genitive Case markers are not licensed at this stage yet, because they are not contained within the projection of an unambiguous [+N] projection (see 1b/5a; cf. 7a). At the next point of left to right processing of a string of words, as shown in (8b), the Nominative Case marker *–ga* first selects the fuzzy projection by [$_{V \text{ or } N}$ *kenkyuu*] (cf. Kageyama 1993, Ito and Sugioka 2002, etc.), where *–no* is not yet licensed properly. However, the Nominative Case marker *–ga* then selects the [+N] feature of the projection of the verbal noun *kenkyuu*, and dynamically turns it into an unambiguous [+N] category as illustrated in (8c), due to categorization condition (3a) (cf. 7c). Consequently, the two Genitive Case markers are successfully licensed at the parsing stage of (8c). The proposed analysis thus accounts for the nominal property of both an AN and a VN by means of dynamic categorization by Case markers in a uniform way (see 7c and 8c).

Let us examine next how the dynamic categorization analysis captures uniformly the adjectival property of an AN and the verbal property of a VN. Consider the examples in (9a-b).

(9) a.　boku-ga　gengogaku-ga　[$_{AN}$ suki]-da.
　　　I　-Nom linguistics –Nom　fond –Cop
　　　'I like linguistics.'

 b.　John-ga　nihongo -o　[$_{VN}$ kenkyuu]　-si -ta.
　　　John-Nom　Japanese-Acc　researching-do-Pst
　　　'John studied Japanese.'

Syntax processes a string of words in (9a) from left to right, basically as shown in (10a-c).

(10)a.　?[$_{AP \text{ or } NP}$ [$_{NP}$ boku]-?ga [$_{A' \text{ or } N'}$ [$_{NP}$ gengogaku] -?ga [$_{A \text{ or } N}$ suki]]]

 b.　?[$_{VP}$ [$_{AP \text{ or } NP}$ [$_{NP}$ boku]-?ga [$_{A' \text{ or } N'}$ [$_{NP}$ gengogaku] -?ga [$_{A \text{ or } N}$ suki]]] [$_V$ da]]

 c.　[$_{VP}$ [$_{AP}$ [$_{NP}$ boku]-ga [$_{A'}$ [$_{NP}$ gengogaku]-ga [$_A$ suki]]] [$_V$ da]]
　　　　　　(*dynamic categorization* 2b)

At the initial point of left to right parsing, syntax constructs structure (10a), where the two Nominative Case markers attached to [$_{NP}$ *boku*] and [$_{NP}$ *gengogaku*] are not licensed yet. This is because the two Nominative Case markers are within the projection of an ambiguous category, the adjectival noun [$_{A \text{ or } N}$ *suki*] (see 1a/4a). Then, the syntactic parser builds structure (10b) by means of initial selection by the copula *da* (cf. Kageyama 1993, Ito and Sugioka 2002, etc.). As illustrated in (10c), however, the copula [$_V$ *da*] then selects the [+A] feature of the projection of [$_{A \text{ or } N}$ *suki*],

dynamically turning it into an unambiguous [+A] category, [$_{AP \text{ .....}}$ *suki*] (see categorization condition 2b). As a result, the two Nominative Case markers are properly licensed in (10c), as desired (Fukui 1986, among others).

Similarly, syntax processes a string of words in (9b) as follows.

(11)a.　?[$_{VP \text{ or } NP}$ [$_{NP}$ John]-?ga [$_{V' \text{ or } N'}$ [$_{NP}$ nihongo]-?o [$_{V \text{ or } N}$ kenkyuu]]]

 b.　?[$_{VP}$ [$_{VP \text{ or } NP}$ [$_{NP}$ John]-?ga [$_{V' \text{ or } N'}$ [$_{NP}$ nihongo] -?o [$_{V \text{ or } N}$ kenkyuu]]] [$_V$ si]]

 c.　[$_{VP}$ [$_{VP}$ [$_{NP}$ John]-ga [$_{V'}$ [$_{NP}$ nihongo] -o [$_V$ kenkyuu]]] [$_V$ si]]
　　　　　　(*dynamic categorization* 3b)

As shown in (11a), at the initial point of left to right parsing, neither the Nominative Case marker *–ga* nor the Accusative Case marker *–o* is licensed. This is so, because those Case markers are contained within the projection of the fuzzy category [$_{V \text{ or } N}$ *kenkyuu*] (see 1b/5a). Then, the light verb [$_V$ *si*] first selects the underspecified projection by [$_{V \text{ or } N}$ *kenkyuu*] as in (11b) (cf. Kageyama 1993, Ito and Sugioka 2002, etc.), where neither *–ga* nor *–o* is properly licensed yet. However, the light verb [$_V$ *si*] then selects the [+V] feature of the projection of the ambiguous category [$_{V \text{ or } N}$ *kenkyuu*], and dynamically turns it into an unambiguous [+V] category (see categorization condition 3b). As a result, both the Nominative Case and the Accusative Case in (11c) are properly licensed within the VP. In this way, the proposed dynamic syntactic analysis also captures uniformly the [+A] property of an adjectival noun and the [+V] property of a verbal noun (see 10c and 11c; cf. 7c and 8c).

Furthermore, the dynamic categorization analysis accounts for the unacceptability of (12a) and (12b) in a uniform manner.

(12)a.　*John-ga [$_{ANP}$ gengogaku-no [$_{AN}$ suki]]-da.
　　　John-Nom　linguistics -Gen　fond -Cop
　　　'John likes linguistics.' (cf. Kuroda 1978)

 b.　*John-ga　[$_{VNP}$ nihongo -no [$_{VN}$ kenkyuu]]
　　　John-Nom　Japanese-Gen　research
　　　'John studied Japanese.'

　　　si -ta. (cf. Kageyama 1993)
　　　do-Pst

The syntactic component necessarily fails to parse a string of words in (12a). Consider (13a-c).

(13)a.　?[$_{AP \text{ or } NP}$ [$_{NP}$ John]-?ga [$_{A' \text{ or } N'}$ [$_{NP}$ gengogaku] -?no [$_{A \text{ or } N}$ suki]]]

b. ?[VP [AP or NP [NP John]-?ga [A' or N'
[NP gengogaku]-?no [A or N suki]]] [V da]]

c. *[VP [AP [NP John]-ga [A' [NP gengogaku]-*no
[A suki]]] [V da]]

(*dynamic categorization* 2b)

At the initial point of left to right processing, the syntactic parser constructs representation (13a), where neither the Nominative Case –*ga* nor the Genitive marker –*no* is licensed. This is because those two Case particles are contained within the fuzzy, underspecified projection [AP or NP *suki*]. Then, the copula [V *da*] first selects the underspecified projection by the [AN *suki*], and the parser builds the structure in (13b) (cf. Kageyama 1993, Ito and Sugioka 2002, etc.). As shown in (13c), at the final stage, the copula *da* then selects the [+A] feature of the projection of the adjectival noun, dynamically turning it into the projection of an unambiguous [+A] category, due to categorization condition (2b). Here, it thus turns out that there is no possibility that the Genitive Case marker –*no* attached to [NP *gengogaku*] is immediately dominated by a [+N] projection, and (12b) is correctly ruled out under the proposed analysis.

Exactly in the same way, the syntactic parser necessarily fails to parse example (12b). Examine now (14a-c).

(14)a. ?[VP or NP [NP John]-?ga [V' or N' [NP nihongo]
-?no [V or N kenkyuu]]]

b. ?[VP [VP or NP [NP John]-?ga [V' or N' [NP nihongo]
-?no [V or N kenkyuu]]] [V si]]

c. *[VP [VP [NP John]-ga [V' [NP nihongo]-*no
[V kenkyuu]]] [V si]]

(*dynamic categorization* 3b)

Given a string of words in (12b), syntax first forms the underspecified representation in (14a), where the Nominative Case –*ga* and the Genitive Case –*no* within the fuzzy projection of [V or N *kenkyuu*] are not yet licensed. At the next point of left to right parsing, as shown in (14b), the light verb [V *si*] first selects the fuzzy projection by the VN *kenkyuu* (cf. Kageyama 1993, Ito and Sugioka 2002, Sugioka 2009, among others). Finally, the light verb *si* then selects the [+V] feature of the projection of the verbal noun, dynamically turning it into the projection of an unambiguous [+V] category because of condition (3b). Here as well, it thus turns out that there is no possibility that the Genitive Case marked NP, *nihongo-no*, is immediately dominated by the projection of a [+N] category. Hence, syntactic representation (14c) is also ruled out correctly, as

desired.

Finally, let us examine the examples in (15a-c).[5]

(15)a. [ANP kirei] [V na] ko
        beautiful Cop girl
        'a girl who is beautiful'

b. *[NP gakusei] [V na] ko
        student   Cop girl
        'a person who is a student'

c. *[AP utukusi] [V na] ko
        beautiful Cop girl
        'a girl who is beautiful' (cf. Kageyama 1993, etc.)

As illustrated in (15b-c), one type of copula verb in Japanese, *na*, cannot take either a noun phrase like [NP *gakusei*] or an adjective phrase like [AP *utukusi*]. Hence, both (15b) and (15c) are unacceptable. On the other hand, as shown in (15a), the copula verb *na* is allowed to select an adjectival noun phrase like [ANP *kirei*]. The data in (15a-c) thus constitute a valuable piece of evidence that an adjectival noun like [AN *kirei*] is distinct from a noun like [N *gakusei*] or an adjective like [A *utukusi*] (cf. Martin 1975, Kageyama 1993, Ito and Sugioka 2002, among others).

With this in mind, consider how the proposed syntactic categorization analysis accounts for the well-formedness of (15a) below:

(16)a. [VP [AP or NP kirei] [V na]]

b. [VP [AP kirei] [V na]]

(*dynamic categorization* 2b)

As in (16a), at the initial point of processing of a string of words in (15a), the copula –*na* first selects the underspecified category, i.e. the adjectival noun [A or N *kirei*] (cf. Kageyama 1993, Ito and Sugioka 2002, etc.), and constructs the [+V] projection. At the subsequent point of the parsing, as shown in (16b), the copula verb *na* then selects the [+A] feature of the AN, and dynamically turns the fuzzy category into an unambiguous [+A] projection, [AP *kirei*], due to categorization condition (2b).

Notice now that the example in (15a) and that in (15c) are similar in a significant respect. That is, the representation in (15c) and that in (16b) are identical in that the copula –*na* selects a [+A] projection in both of those two structures. Nonetheless, under the proposed dynamic categorization analysis, there is a crucial difference between (15a) and (15c): for (15a), there is a parsing stage, i.e. (16a), where the copula *na* can select successfully the ambiguous category [AP or NP *kirei*], satisfying its initial selectional requirement. For (15c),

on the other hand, there is no such processing stage where *na* can select an AN. Namely, *kirei* is an underspecified, [+A] or [+N] category, first (see 16a), and is then dynamically turned into an unambiguous [+A] category (see 16b). However, the adjective [A *utukusi*] can never be an adjectival noun at any parsing stage (see 15c).

Similarly, as in (17a),

(17)a. [VP or NP kenkyuu] [V si]-ta.
            researching do-Pst
         'Somebody studied something.'

  b. *[NP tyoosyoku] [V si] -ta.
          breakfast   do -Pst
       'Somebody had breakfast.'

  c. *[VP tabe] [V si] -ta.
          eat   do -Pst
       'Somebody ate.'   (cf. Kageyama 1993, etc.)

the light verb [V *si*] can select a fuzzy [+V] or [+N] projection like [VP or NP *kenkyuu*]. As shown in (17b-c), however, the light verb cannot select an NP like [NP *tyoosyoku*] or a VP like [VP *tabe*]. The data in (17a-c) thus show that a verbal noun like [VN *benkyoo*] is a unique category which is different from either a noun like [N *tyoosyoku*] or a verb like [V *tabe*] (cf. Martin 1975, Kageyama 1993, Ito and Sugioka 2002, among others).

Under the dynamic categorization analysis, the syntactic parser processes a string of words in (17a) as follows:

(18)a. [VP [VP or NP kenkyuu] [V si]]

  b. [VP [VP kenkyuu] [V si]]
                          (*dynamic categorization* 3b)

As in (18a), at the initial point of processing, the light verb [V *si*] first selects the underspecified [+V] or [+N] projection, [VP or NP *kenkyuu*], satisfying its initial selectional requirement (cf. Kageyama 1993, Ito and Sugioka 2002, Sugioka 2009, etc.). As shown in (18b), at the next stage, the light verb then selects the [+V] feature of the verbal noun, and dynamically turns it into the unambiguous projection [VP *kenkyuu*] by means of categorization condition (3b).

(17a) and (17c) thus turn out as well to have an important similarity: in (17c), the light verb [V *si*] selects the [+V] projection, [VP tabe]; in (18b) for (17a), the light verb selects the [+V] projection, [VP *kenkyuu*], in the same way. Exactly like (15a) and (15c), however, there is a crucial difference between (17a) and (17c). That is, for (17a), there is a processing stage, i.e. (18a), where the light verb [V *si*] can successfully select the underspecified projection [VP or NP *kenkyuu*]; but for

(17c), there is no such parsing stage where the verb [V *tabe*] can be a verbal noun. Recall that a verbal noun like [VN *kenkyuu*] is a category underspecified for [+V] or [+N] at the initial point of sentence processing, but can be later turned into a [+V] category by means of dynamic categorization condition (3b). On the other hand, a verb is always a verb, and it can never be a verbal noun, i.e. an underspecified, [+V] or [+N] category, at any point of a parsing process.

Therefore, under the proposed syntactic categorization analysis, it is indeed the dynamics of language that is the key to differentiate the adjectival noun [A or N *kirei*] in (15a) from the adjective [A *utukusi*] in (15c), and that is also the key to distinguish the verbal noun [V or N *kenkyuu*] in (17a) from the verb [V *tabe*] in (17c).

3. Conclusion

In this paper, I have argued that in the lexicon, an adjectival noun like [AN *suki*] is underspecified with respect to [+A] or [+N] as in (19a); a verbal noun like [VN *kenkyuu*] is also an underspecified category for [+V] or [+N] as in (19b).

(19)a. [A or N *suki*]
  b. [V or N *kenkyuu*]

Under the dynamics of language processing, categorization condition (2a) turns the fuzzy category [A or N *suki*] into an unambiguous noun as in (20a); condition (3a) turns [V or N *kenkyuu*] into an unambiguous noun as in (20b).

(20)a. [N *suki*]
  b. [N *kenkyuu*]

On the other hand, depending on dynamic, syntactic environments, categorization condition (2b) turns the underspecified category [A or N *suki*] into the adjective [A *suki*] as in (21a); condition (3b) turns the fuzzy category [V or N *kenkyuu*] into the verb [V *kenkyuu*] as in (21b).

(21)a. [A *suki*]
  b. [V *kenkyuu*]

If the proposal is correct, it thus cannot be the case that i) [AN *suki*] is just a noun; ii) [AN *suki*] is simply an adjective; iii) [AN *suki*] is a mixed category of [+N] and [+A] features; or iv) [AN *suki*] is three way ambiguous among (19a), (20a) an (21a). Similarly, it is not the case that i) [VN *kenkyuu*] is simply a noun; ii) [VN *kenkyuu*] is just a verb; iii) [VN *kenkyuu*] is a dual category of [+N] and [+V] features; or iv) [VN *kenkyuu*] is three way ambiguous among (19b), (20b), and (21b).

Here, I have also attempted to clarify the nature of two step selection triggered by dynamic categorizers. That is, I have tried to show that dynamic categorizers

such as Japanese Case markers or the light verb [v *si*] initially select an underspecified category like an AN or a VN (see 7b, 8b, 10b, 11b, 13b, 14b, 16a, and 18a), and then, select an unambiguous feature like [+N], [+A] or [+V] for dynamic categorization (see 7c, 8c, 10c, 11c, 13c, 14c, 16b and 18b). Such syntactic categorizers thus trigger selection twice dynamically in the course of left to right processing of a string of words. The result of earlier selection thus vanishes at a later stage of sentence processing. This consequence, I believe, is natural, given the dynamic nature of language (cf. Kempson et al. 2001, Cann et al. 2005, Kempson 2016, Kempson 2017, among others).

References

Aarts, B., D. Denison, E. Keizer, and G. Popova (2004) *Fuzzy Grammar: A Reader*, Oxford University Press.

Aarts, B. (2007) *Syntactic Gradience: The Nature of Grammatical Indeterminacy*, Oxford University Press.

Cann, R., R. Kempson, and L. Marten (2005) *The Dynamics of Language: An Introduction*, Syntax and Semantics volume 35, Elsevier/Academic Press.

Chomsky, N. (1965) *Aspects of the Theory of Syntax*, MIT Press.

Chomsky, N. (1981) *Lectures on Government and Binding*, Foris, Dordrecht.

Chomsky, N. (1986) *Knowledge of Language: Its Nature, Origin, and Use*, Praeger, New York.

Chomsky, N. (1995) *The Minimalist Program*, MIT Press.

Croft, W. (2001) *Radical Construction Grammar: Syntactic Theory in Typological Perspective*, Oxford University Press.

Culicover, P. and R. Jackendoff (2005) *Simpler Syntax*, Oxford University Press.

Fanselow, G. C. Féry, R. Vogel, and M. Schlesewsky (2006) *Gradience in Grammar:Generative Perspectives*, Oxford University Press.

Fukui, N. (1986) *A Theory of Category Projection and its Application*, PhD dissertation, MIT.

Grimshaw, J. and A. Mester (1988) 'Light Verbs and θ-marking,' *Linguistic Inquiry* 19, 205-232.

Hawkins, J. A. (1990) 'A Parsing Theory of Word Order Universals,' *Linguistic Inquiry* 21, 223-61.

Hawkins, J. A. (1994) *A Performance Theory of Order and Constituency*, Cambridge University Press.

Hawkins, J. A. (2004) *Efficiency and Complexity in Grammars*, Oxford University Press.

Hawkins, J. A. (2014) *Cross-linguistic Variation and Efficiency*, Oxford University Press.

Hoshi, H. (2014) 'Case, Tense and Light Verb Constructions: A Dynamic Property of Language,' in Kishimoto, H. and Y. Yumoto (eds.), *Hukuzatu-zyutugo-kenkyuu-no Genzai*, Hituzi Syobo.

Hoshi, H. (2019a) 'Dynamic Categorization of Adjectival Nouns and Verbal Nouns: A Study of Fuzzy Categories,' *Memoirs of Faculty of Education and Human Studies*, Akita University, 77-84.

Hoshi, H. (2019b) 'Fuzzy Categories and Dynamic Categorization,' *Annual Research Report on General Education*, Akita University, 29-43.

Ito, T. and Y. Sugioka (2002) *Go-no Sikumi-to Gokeisei* [Structure of Words and Word Formation], Kenkyusha.

Kageyama, T. (1993) *Bunpoo-to Gokeisei* [Grammar and Word Formation], Hituzi Syobo.

Kempson, R., W. Meyer-Viol, and D. Gabbay (2001) *Dynamic Syntax: The Flow of Language Understanding*, Blackwell Publishers.

Kempson, R. (2016) 'Syntax as the Dynamics of Language Understanding,' in K. Allan (ed.), The Routledge Handbook of Linguistics, Routledge.

Kempson, R. (2017) 'Shifting Concepts of Language: Meeting the Challenge of Modelling Interactive Syntax, in E. Weigand (ed.), *The Routledge Handbook of Language and Dialogue*, Routledge.

Kishimoto, H. and Y. Yumoto (2014) *Hukuzatu-zyutugo-kenkyuu-no Genzai*, Hituzi Syobo.

Kuno, S. (1973) *The Structure of the Japanese Language*, MIT Press.

Kuroda, S.-Y. (1978) 'Case-marking, Canonical Sentence Patterns and Counter Equi in Japanese, in Hinds, J. and Irwin Howard (eds.), *Problems in Japanese Syntax and Semantics*, Kaitakusha, Tokyo.

Kuroda, S.-Y. (1992) *Japanese Syntax and Semantics*, Kluwer Academic Publishers.

Martin, S. (1975) *A Reference Grammar of Japanese*, Yale University Press.

Matsumoto, Y. (1996) Complex Predicates in Japanese: A Syntactic and Semantic Study of the Notion 'Word,' Kurosio Publishers.

Miyagawa, S. (1987) 'Lexical Categories in Japanese,' *Lingua* 73, 29-51.

Murasugi, K. (1988) 'Adjectives, Nominal Adjectives and Adjectival Nouns in Japanese: Their Lexical and Syntactic Status,' General Examination Paper, University of Connecticut.

Phillips, C. (1996) *Order and Structure*, PhD dissertation, MIT.

Saito, M. (1982) 'Case Marking in Japanese,' ms., MIT.

Saito, M. (1985) *Some Asymmetries in Japanese and their Theoretical Implications*, PhD dissertation, MIT.

Saito, M. and H. Hoshi (2000) 'The Japanese Light Verb Construction and the Minimalist Program,' in Martin, R., D. Michaels and J. Uriagereka (eds.), *Step by Step: Essays on Minimalist Syntax in Honor of Howard Lasnik*, MIT Press.

Sugioka, Y. (2009) '"-*Tyuu*"-no Tagisei: Zikan-o Arawasu Setuzi-o Meguru Koosatu,' in Yumoto, Y. and H. Kishimoto (eds.), *Goi-no Imi-to Bunpoo*, Kurosio Publishers.

Uehara, S. (1998) *Syntactic Categories in Japanese: A Cognitive and Typological Introduction*, Kurosio Publishers.

Yumoto, Y. (2005) *Fukugoo-doosi・Hasei-doosi-no Imi-to Toogo:Module-keitairon-kara Mita Nichieigo-no Doosi-keisei*, Hituzi Syobo.

Yumoto, Y. and H. Kishimoto (2009) *Goi-no Imi-to Bunpoo*, Kurosio Publishers.