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Japanese morpheme classification using the 4-M model

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Abstract

This paper attempts to classify Japanese morphemes using the 4-M model, which is a refined version of the content vs. system morphemes opposition presented in the Matrix Language Frame (MLF) model. It is a production based model which explains how different morphemes are accessed in different ways in speech production. There are four categories of morphemes in the 4-M model, i.e. content morphemes and three types of system morphemes. The heart of the 4-M model is the fact that system morphemes are activated at two different abstract levels. They are classified as early and late. Content morphemes, along with early system morphemes, are conceptually activated whereas late system morphemes are not. They are structurally assigned. Furthermore, late system morphemes are divided into two types, i.e. bridges and outsiders.

This paper, examining lexical categories and word formation of Japanese, proposes that content morphemes in Japanese include free-standing independent morphemes, discourse markers such as conjunctions and sentence-final particles, and postpositions. The candidates for early system morphemes are derivational suffixes and prefixes as well as verbal suffixes. The candidates for bridges include the genitive case marker *no* and the coordinating particle *to*. The copula could also be considered a bridge system morpheme. Case particles in Japanese could be considered outsider system morphemes like case in other languages.

Keywords: the MLF model, the 4-M model, Japanese morphemes, early system morphemes, late system morphemes

1. Introduction

Based on the understanding that in bilingual speech one of the languages is normally dominant over the other, Myers-Scotton (1993[1997]) formulated the Matrix Language Frame (MLF) model, in which she classified morphemes in complementizer phrases (CP) into two kinds: content morphemes, such as nouns and verbs, and system morphemes, such as inflections and most function words. A major difference between content morphemes and system

morphemes is that most content morphemes either assign or receive thematic roles, while system morphemes do not.

The contact languages play different roles. The language with the dominant role, that is, the one that is used for the system morphemes, is called the matrix language (ML). The embedded language (EL) is the language from which content morphemes are inserted into the ML. The MLF model claims that in mixed ML + EL constituents, only the ML is used to build the frame. That is, the ML determines the morphosyntax of ML + EL constituents. Modified versions of the model have since appeared (Jake & Myers-Scotton, 1997; Myers-Scotton, 2002; Myers-Scotton & Jake, 1995, 2001; etc.), and the definitions of some terms of the MLF model have been elaborated or revised. The model has been tested in many language contact situations with positive results (Bolonyai, 1998; Jake & Myers-Scotton, 1997; etc.)

Extending the MLF model, a new morpheme categorization model called the 4-M model has been proposed (Myers-Scotton, 2002, 2006; Myers-Scotton & Jake, 2000, 2001). There are four categories of morphemes in the 4-M model, i.e. content morphemes and three types of system morphemes. This model is a refined version of the content vs. system morpheme opposition, and explains how different morphemes are accessed in different ways in speech production. The heart of the 4-M model is the fact that system morphemes are activated at two different abstract levels. They are classified as early and late. Furthermore, late system morphemes are divided into two types: bridges and outsiders. The 4-M model has since been applied in explaining many language contact phenomena (e.g. Bolonyai, 2000; Fuller, 2000; Gross, 2000; Schmitt, 2000; Wei, 2000; Türker, 2005). Some investigations have been done on Japanese-English language contact data (Sugimori, 2006; Takagi, 2006b; Namba, 2008; etc.). However, no paper has focused explicitly on classifying Japanese morphemes using the 4-M model. This paper attempts to do so. First I examine the morphology of Japanese, and then provide a detailed description of the theory of the 4-M model. After that, I propose my own classification of Japanese morphemes.

2. Morphological characteristics of Japanese

This section focuses on the morphology of Japanese, i.e. the internal structure of words and the process of word formation. Let us first consider lexical categories.

2.1 Lexical categories

2.1.1 Nouns

Nouns can co-occur with demonstrative words such as *kono* (this) and *sono* (that), as in *kono hana* (this flower) and *sono hon* (that book). They can take noun modifiers, which precede them, and which take the particle *no* (the genitive case particle). For example,

(1) a. *Hanako no hon*

Hanako GEN book (Hanako's book)

b. *kinoo no shinbun*

yesterday GEN newspaper (yesterday's paper)

c. *Tokyo no chizu*

Tokyo GEN map (a map of Tokyo)

d. *Momotaro no hanashi*

Momotaro GEN story (the story about Momotaro)

Hon (book), *shinbun* (newspaper), *chizu* (map), and *hanashi* (story) in these examples are nouns that are modified by a preceding noun. In (1a), the possessive relation is mediated by the genitive case particle *no* between the two nouns. The type of pre-nominal modification mediated by the genitive case particle *no* is not limited to the possessive relation. As the other examples in (1) show, it ranges over a variety of relations between the two nouns.

A noun can be linked by the coordinating particle *to* (and), as in *otoko to onna* (man and woman) and *Jon to Mearii* (John and Mary). Unlike English 'and', the coordinating particle *to* can combine only nouns, so it can not be used to join adjectives, as in **ookii to ii* (big and good), or to join verbs, as in **iku to miru* (go and see).

Japanese nouns are associated with a conjugational paradigm, which is realized by the accompanying copula *da*, illustrated below with the noun *hon* (book).

(2) a. non-past   *hon da*   (it is a book)

b. non-past NEG   *hon ja-nai*   (it's not a book)

c. past   *hon dat-ta*   (it was a book)

d. past NEG   *hon ja-nakat-ta*   (it wasn't a book)

e. tentative   *hon daroo*   (it is probably a book)

2.1.2 Verbs

Verbs are most readily identified by the various inflectional endings that can be placed on them. For example, the non-past tense ending *-(r)u* is attached exclusively to verbal roots. The

following are some examples.

(3)   a. *tabe-ru* (eat)   b. *yom-u* (read)   c. *mi-ru* (look at)

d. *nom-u* (drink)   e. *kae-ru* (return)   f. *oyog-u* (swim)

Verbs in Japanese do not indicate number, gender, or person, although present, past, and conditional times are marked on them. They inflect in the manner shown in (4)[1].

(4)			
a. Present (or non-past)	*tabe-ru*	*hanas-u*	(eat, speak)
b. Perfect (or past)	*tabe-ta*	*hanas-ita*	(ate, spoke)
c. Imperative	*tabe-ro/ tabe-yo*	*hanas-e*	(Eat! Speak!)
d. Cohortative	*tabe-yoo*	*hanas-oo*	(Let's eat, Let's speak.)
e. Continuative	*tabe*	*hanas-i*	(eating, speaking)
f. Gerundive	*tabe-te*	*hanas-ite*	(eat-and, speak-and)
g. Conditional	*tabe-reba*	*hanas-eba*	(if ... eat, speak)
h. Perfect conditional	*tabe-tara*	*hanas-itara*	(if...have eaten, spoken)
i. Perfect suppositional	*tabe-taroo*	*hanas-itaroo*	((I suppose)...)

(Kuno, 1973: 28)

Shibatani (1990) points out that one of the major issues in Japanese verb inflection is the distinction between inflectional endings and auxiliaries (as well as particles). Though never explicitly formulated, according to traditional grammar Japanese verbal morphology involves the following composition of elements:

(5)   Root + Inflectional ending ｜ (+ Auxiliary) ｜ (+ Particle)

Stem   (Shibatani, 1990: 224)

In this analysis, the inflectional endings are considered to be stem-forming elements, and the auxiliaries and particles attach to the verbal stems, never directly to the verb root. Auxiliaries attached to a stem also inflect and form more complex stems to which other auxiliaries may further attach, as in the following example.

(6)   *aruk-a* + *se*   + *ta*   + *node*   'because (I) made X walk,'

walk   + CAU + PAST + because (V root - ending + aux + aux + conjunctive particle)

V stem + Auxiliaries   + Particle

In (6), *aruk-a* is the verbal form, to which two auxiliaries *se* and *ta* are suffixed, and then, the conjunctive particle *node* (because) is attached.

In its verbal morphology, Japanese may use a string of suffixes. Given the varieties of morphemes existing in Japanese, the relative order among morphemes plays a crucial role in forming words when more than one suffix is sequenced. The order of these verbal suffixes is

generally fixed. The following is the typical order:

    (7) V stem-causative-passive-aspect-desiderative-NEG-tense   (Shibatani, 1990: 307)

Not all the possibilities are used in each expression, of course, but the following illustrates some of the lengthy but fairly commonly observed forms.

    (8) a. *tabe-sase -rare   -na -i*

          eat -CAU-POTEN-NEG-PRES   'cannot make X eat'

        b. *tabe-sase -rare -taku -na -i*

          eat -CAU-PASS-DES-NEG-PRES   'do not want to be made to eat'

        c. *aruka-se   -te i   -ta -i*

          walk -CAU-PROG-DES-PRES   'want to continue to make X walk'

        d. *aruka-se   -rare -te i   -taku -nakat-ta*

          walk -CAU-PASS-PROG-DES-NEG-PAST

          'did not want to continue to be made to walk'

In this way, if we analyze Japanese verbs morphologically, various auxiliary suffixes can be identified.

2.1.3 Adjectives

    Adjectives are traditionally analyzed as having a similar type of conjugational forms as verbs, functioning both attributively and as predicates (Loveday, 1996). They can constitute predicates without being accompanied by copulas. As is shown in (9), they inflect in a manner similar to verbs.

(9)	a. Present (non-past)	*aka-i*	(is red)
	b. Perfect (past)	*aka-kat-ta*	(was read)
	c. Suppositional	*aka-kar-oo*	(I suppose .... is red)
	d. Continuative	*aka-ku*	(in a red manner)
	e. Gerundive	*aka-ku-te*	(is red and)
	f. Conditional	*aka-ke-reba*	(if ... is red)
	g. Perfect conditional	*aka-kat-tara*	(if it was (has been) red)
	h. Perfect suppositional	*aka-kat-taroo*	(I suppose ... was red)

                                                                 (Kuno, 1973:28)

    In addition to the major lexical categories of nouns, verbs and adjectives, as well as such minor categories as demonstratives, adverbs and conjunctions, Japanese has two unique lexical categories, namely adjectival nouns and verbal nouns. Let us turn to these two categories.

2.1.4 Adjectival nouns

Adjectival nouns[2] are characterized by their dual behaviour as both adjectives and nouns. They are like adjectives in that they modify the nouns that follow them, and also they can be modified by a degree adverb like *totemo* (very), as adjectives can, a property which regular nouns do not have. This is demonstrated by the following examples.

(10) *kirei-na kami*   *totemo kirei-na kami*   (adjectival nominal attribute)

       pretty paper   very pretty paper

       (pretty paper)   (very pretty paper)

In (10), *kirei* (pretty) is an adjectival noun. It is adjectival in syntax, and *-na* is added to it when it modifies the following noun.

Adjectival nouns also share certain characteristics with nouns: they do not inflect, and they take the copula when they are used as predicates. For example,

(11) a. *Ano hito   wa   gakusei da.*   (nominal predicate)

         that person TOP student copula

         (That person is a student.)

      b. *Ano hito   wa   kirei   da.*   (adjectival nominal predicate)

         that person TOP pretty copula

         (That person is pretty.)

In these examples, *gakusei* (student) is a noun, and *kirei* (pretty) is an adjectival noun. Unlike adjectival nouns, adjectives inflect, and can constitute predicates without taking copulas. For example,

      c. *Ano hito   wa   utsukushi-i.*   (adjectival predicate)

         that person TOP beautiful-PRES

         (That person is beautiful.)

      d. *Ano hito   wa   utsukushi-katta.*   (adjectival predicate)

         that person TOP beautiful-PAST

         (That person was beautiful.)

      e. *Kono hon   wa   atarashi-i.*   (adjectival predicate)

         this book TOP new-PRES

         (This book is new.)

      f. *Kono hon   wa   atarashi-ku-te omoshiro -i.*   (adjectival predicate)

         this book TOP new   and   interesting-PRES

         (This book is new and interesting.)

In these examples, *utsukushi-katta* and *atarashi-ku-te* are inflected forms of *utsukushi-i* (beautiful) and *atarashi-i* (new), respectively.

Adjectival nouns take the conjugation paradigm of nouns, together with the copula, rather than that of adjectives. In this sense, they are called nouns. However, adjectival nouns differ from regular nouns in that they cannot directly take case particles such as the nominative marker *ga* or the accusative *o*. Therefore, **kirei ga* (pretty NOM) and **kirei o* (pretty ACC) are not possible. Also, while regular nouns can be modified by demonstrative words, such as *kono* (this) and *sono* (that), as well as by other nouns, adjectival nouns cannot. As has already been seen in (10), when an adjectival noun modifies a noun, *-na* is added to establish the modification relation, but this modification relation is expressed by the genitive case particle *no* when a noun modifies another noun, as in *Hanako no hon* (Hanako GEN book, Hanako's book). Thus, the *na* ending indicates that the word preceding it is an adjectival noun.

2.1.5 Verbal nouns

The term verbal noun[3] (VN) indicates that these words have a dual status as both verb and noun. Verbal nouns are identified by their ability to take *suru* (do) when used as finite verbs, as in *kenkyuu-suru* (do study) and *ryokoo-suru* (do travel). The verb *suru* by itself is a full-fledged verb, but when it is combined with a verbal noun, its own meaning is hardly retained. Rather, the meaning of the compound verb consisting of a verbal noun and *suru* is based mainly on the meaning of the verbal noun. The primary role of *suru* is, then, to carry the verbal inflection, such as non-past, past, and so on.

Verbal nouns are like other nouns in that they can function as subject or object, taking the case particles *ga* or *o* respectively:

(12) a. *Kenkyuu ga   hitsuyoo   da.*   b. *kenkyuu o   hajimeru*

      Study   NOM necessary copula   study   ACC begin

      (Studying is necessary.)   (begin studying)

This nominal nature of verbal nouns yields analytic syntactic expressions alongside compound verbal expressions. This situation is schematized in (13).

(13) *kenkyuu-suru → kenkyuu o   suru*

      study -do   study   ACC do

      (VN)   → (N)   (V)

2.1.6 Postpositional particles

Japanese lacks prepositions. All case relations and other functional relations that would be represented in English by prepositions, subordinating conjunctions, and coordinating conjunctions are expressed in Japanese by particles that are postpositional (not suffixes). There are some seventy postpositional particles (Kuno, 1973), but there are no prepositional particles in Japanese. This characteristic is shared by Japanese with many other SOV languages, which has led Greenberg (1963) to hypothesize the following as a language universal: with overwhelmingly greater than chance frequency, languages with normal SOV order are postpositional.

Grammatical relations in a sentence are expressed by postpositional particles called case-marking particles, which include the nominative (NOM) *ga*, the accusative (ACC) *o*, the dative (DAT) *ni*, and the genitive (GEN) *no*, etc. The following sentences illustrate this:

(14) a. *Ojiisan   ga   Momotaro ni   ken   o   yatta.*
        grandfather NOM   DAT   sword ACC   gave
        (Grandfather gave Momotaro a sword.)

 b. *Cinderella ga   kin   no   basha de oshiro ni itta.*
                NOM   gold   GEN   coach by palace to went
        (Cinderella went to the palace in a golden coach.)

The nominative case marker *ga* normally indicates that the accompanying noun is the subject of the sentence. The accusative case marker *o* marks the noun that immediately precedes it as the direct object. The dative case marker *ni* is primarily associated with verbs of giving, and together with a noun, it signals the recipient. The genitive case marker *no* is used to establish a modification relation with the following noun. Case-marking particles do not bear specific semantic content. Their roles are more functionally determined within a sentence in that they indicate the fact that the accompanying noun functions as subject, object, and so forth in a sentence (Tsujimura, 2007).

Other postpositional particles include *de* (at), *e* (to), *to* (with), *made* (until), and *kara* (from), as the following examples show:

(15) a. *uchi de*   (*de*: locative, instrumental)   b. *eki   e*   (*e*: allative)
        house at   'at home'   station to 'to the station'
 c. *tomodachi to*   (*to*: comitative)   d. *goji   made*   (*made*: terminative)
        friend   with 'with a friend'   5 o'clock until 'until 5 o'clock'
 e. *gakkoo kara*   (*kara*: ablative)
        school from   'from school'

These particles cannot stand by themselves and always attach to a noun in order to form a meaningful unit. If a postpositional particle were stranded by itself in a phrase or sentence, there is no way we could interpret it. Tsujimura (2007) categorizes these particles as 'postpositions', which are distinguished from case-marking particles[4].

A quoted sentence is marked by the quotative particle (QUO) *to*, or its phonological variation *tte*. *Tte* is more often used for quotation in spoken/informal Japanese. An example is shown below.

(16) *Oojisama ga   "Boku to   odotte-kudasai" to   iimashita.*
     prince   NOM   me   with   please dance   QUO   said
     'The prince said, "Please dance with me".'

Another important particle is the topic marker (TOP) *wa*, which singles out an accompanying noun as the topic of the sentence. According to Kuno (1973), Japanese is one of the relatively few languages of the world that have a built-in mechanism for specifying the theme or topic of the sentence. For example,

(17) a. *Obaasan   wa   itsumo kawa ni sentaku   ni   itte   ojiisan   wa ...*
     grandmother TOP always river to washing for went grandfather TOP
     'Speaking of grandmother, (she) always went to river for washing, and
     speaking of grandfather, (he) ....'
    b. *Momotaro wa   chikaramochi da.*
            TOP   strong   copula
     'As for Momotaro, (he) is strong.'

Not all Japanese particles are used to represent case relationships, or to represent the functions that are carried out in English by prepositions and conjunctions. There are also particles called sentence-final particles (*yo, ne, ka*, etc). In spoken Japanese, sentences seldom end with a bare verb form (Martin, 1975). Sentences often end with sentence-final particles and tag-like auxiliary forms, which have primarily a pragmatic function (Nishimura, 1997). Kuno (1973) suggests that sentence-final particles reveal the speaker's attitude toward the content of the sentence. According to Maynard (1988), they add a personal dimension to the speaker's statement, expressing the speaker's involvement in the conversation. Although they are similar to the English tag, 'you know', there are many more Japanese sentence-final particles and their meanings are more diverse. For instance,

(18) a. *Kore wa kabocha desu **yo***.

'This is a pumpkin, I'm telling you.'

b. *Kore wa kabocha desu **ne***.

'This is a pumpkin, don't you think?'

c. *Sore wa sugoi **naa***.

'It is great, I'm very impressed.'

Yo signifies the authoritativeness of the speaker concerning what the sentence says; the speaker might sound as if he is imposing his opinion on the listener. *Ne*, by asking for confirmation or agreement from the hearer, brings the speaker and the listener closer. Syntactically, it would be easy to add Japanese sentence-final particles to the end of English sentences such as the following[5]:

d. This is a lovely dress, *ne*.

'This is a lovely dress, don't you think?'

The sentence-final particle *ne* is frequently used by children. They tend to append it to every single utterance, as a soft confirmatory tag. The habitual use of *ne* is a feature of children's speech regardless of sex. (Some examples are given in Takagi (2000).)

2.2 Affixation

A very common process of word formation is affixation, which includes prefixation and suffixation. Japanese has a large number of suffixes which, as stated by Williams (1981), perform a category-changing function. One example is the suffixation of the noun-forming derivational morpheme[6] *-te* (agentive), e.g., *kak-u* 'write' → *kak-i-te* 'writer'. This suffix is affixed to verbal stems and changes verbs to nouns. Similarly, the suffix *-sa* is added to adjectival roots and changes them into nouns, e.g., *utsukushi-i* (beautiful) → *utsukushi-sa* (beauty).

Adjectival nouns are like adjectives in that they can also be nominalized by the derivational morpheme *-sa*, which cannot be attached to regular nouns. For example:

(19) *kirei-sa*   'prettiness'   (< adjectival noun)

    *gakusei-sa 'student-ness' (noun)

There is one derivational suffix that derives adjectives from nouns, namely, *-rashii*. Thus, nouns such as *gakusei* (student) yield adjectives such as *gakusei-rashii* (student-like). Once a noun, e.g. *gakusei*, is made into an adjective by the suffixation of *-rashii*, it can then be nominalized by *-sa* like other adjectives: *gakusei-rashi-sa* (student-like-ness).

An example of a prefix is the derivational morpheme *su-* (bare). In (20), the morpheme *su-*

is prefixed to nouns:

    (20) a. *ashi*   'leg'   →   *su-ashi*   'bare leg'

         b. *hada*   'skin'   →   *su-hada*   'bare skin'

         c. *te*   'hand'   →   *su-de*   'bare hand'

         d. *kao*   'face'   →   *su-gao*   'bare face'

The *su-* prefix does not change the category of the word to which it is attached, but rather its meaning. That is, the morpheme *su-* supplies the base noun with the meaning of bareness.

    Some Japanese prefixes derived from Chinese often can change nouns to adjectival nouns. The following are some examples:

    (21) a. *chuui*   'attention'   →   ***fu**-chuui*   'careless'

         b. *jyooshiki* 'common sense'   →   ***hi**-jyooshiki* 'senseless'

         c. *shinkei*   'nerve'   →   ***mu**-shinkei*   'insensitive'

The prefixes *fu-, hi-, mu-* are all of Chinese origin, and they add a negative meaning to the base form. Note that *na* is used with adjectival nouns to establish a modification relation with the following noun. In contrast, when a prenominal modifier is a noun, the modification relation is mediated by the genitive case particle *no*, as is seen in (22).

    (22) <u>noun</u>   <u>adjectival noun</u>

         a. *chuui*   ***-no***   *kotoba*   ⇒   *fu-chuui*   ***-na*** *hito*

            attention-GEN   word   careless   person

            (words for attention)   (careless person)

         b. *jyooshiki* ***-no***   *koto*   ⇒   *hi-jyooshiki*-***na***   *hito*

            common sense-GEN matter   lacking-in-common-sense   person

            (matters of common sense)   (a person lacking in common sense)

         c. *shinkei-**no***   *byooki*   ⇒   *mu-shinkei-**na*** *hito*

            nerve-GEN illness   insensitive   person

            (illness of the nerves)   (an insensitive person)

The fact that the prefixed nouns take *na*, rather than *no*, to mediate a modification relation with the following nouns in (22) shows that these prefixed words, *fu-chuui* 'careless', *hi-jyooshiki* 'senseless', and *mu-shinkei* 'insensitive', are adjectival nouns.

3. The 4-M model

This section focuses on the 4-M model. The major premise of the 4-M model is the Differential Access Hypothesis[7]. While the MLF model emphasizes the content vs. system morpheme opposition, the 4-M model adds the distinction between early and late system morphemes. The model is especially concerned with viewing morphemes in terms of how they are activated in a model of language production. Content morphemes, along with early system morphemes, are specifically characterized as conceptually activated. This means that a speaker's pre-linguistic intentions activate them. This activation happens at the first level of language production called the mental lexicon (lemma) level. The overall model is derived from that in Levelt (1989).

3.1 Conceptually activated morphemes: content morphemes and early system morphemes

Content morphemes are activated at the lemma[8] level and assign or receive a thematic role. They are 'directly elected' by the semantic/pragmatic feature bundle, mapping conceptual structure on to the lemma. Early system morphemes are also activated at the lemma level, but they do not assign or receive thematic roles. Such morphemes are 'indirectly elected' because content morphemes 'point to' them (cf. Bock & Levelt, 1994). They are called 'early' because of the hypothesis about their early activation in the language production process. Early system morphemes flesh out the meaning of the lemmas of the content morphemes that elect them.

Formally, early system morphemes are realized inside the maximal projection of the content morpheme that elects them. Their forms depend on the content morpheme with which they occur. Examples of early system morphemes include plural markings (-*s* plural suffix in English), determiners (e.g. the definite article *the* and the indefinite articles *a, an* in English), and satellite prepositions (also called verb particles) in phrasal verbs. Examples of these can be found in the following sentences.

(23) Bora chewed up the new toy.

(24) Stella prefers the food of Mexico.

In these sentences, *Bora, chew, new, toy, prefer, food* and *Mexico* are all content morphemes. Some of these content morphemes indirectly elect early system morphemes. In (23), *chew* indirectly elects *up*; that is *chew up* conveys a different meaning than simply *chew* does. Also, *toy* indirectly elects *the*. That is, *the* adds definiteness to *toy* (Myers-Scotton & Jake, 2000).

Together, content morphemes and early system morphemes express the bundle of semantic

and pragmatic features that satisfy the speaker's intentions. In (24), for example, the same semantic/pragmatic feature bundle activates both *the* and *food*. This conceptual link between content and early system morphemes means that the EL early system morphemes have more potential for appearing in bilingual clauses framed by the ML than do the other EL system morphemes. (We see examples of this in Takagi (2006a, b).) In opposition to content and early system morphemes, late system morphemes are not conceptually activated, but are structurally assigned and not accessed until later when a larger constituent is constructed.

3.2 Structurally assigned morphemes: late system morphemes

Late system morphemes are neither activated at the lemma level, nor do they receive/assign thematic roles. They are called 'late' because the model claims that they are not activated until a later production level, at a second abstract level that is called formulator[9]. The late system morphemes are activated to indicate relationships within the clause; they are the cement that holds the clause together (Myers-Scotton, 2006). Instead of conveying essential conceptual structure, these late system morphemes are crucial in building the larger syntactic units because they indicate relationships in the mapping of conceptual structure on to phrasal structures (Myers-Scotton, 2002).

One type of late system morpheme is called a 'bridge'. As the name implies, bridge system morphemes provide bridges; they occur between phrases that make up a larger constituent. The best example of a bridge is the associative or possessive element that occurs between a possessor noun and the element that is possessed, which is found in many languages. Thus, in English *of* is a bridge, as in *the roof of the house*. The possessive *'s* in English is also a bridge morpheme as in *John's book*. A bridge morpheme depends on the well-formedness conditions of a specific constituent in order for it to appear. That is, the constituent is not well-formed without the bridge morpheme (Myers-Scotton, 2006).

The other type of late system morpheme is called an 'outsider'. Outsider system morphemes also meet well-formedness conditions. But outsiders differ from bridges in that the presence and form of an outsider depends on information that is outside the element with which it occurs and therefore outside its immediate phrase, and usually outside its immediate constituent (Myers-Scotton, 2006). The clearest example of an outsider morpheme in English is the element that shows subject-verb agreement in the verb. The form of the agreement marker depends on the subject. Thus, in (24), the third person singular - *s* is an outsider late system morpheme. This outsider must look outside of its placement (outside the VP) for information

about its form (whether it is *prefer* or *prefers*); that is, subject-verb agreement.

Outsiders differ from bridges in that, with bridges, it is the particular syntactic construction that tells us that a bridge morpheme must be used, and which one. But with outsiders, it is information outside the construction in which it appears that matters, not the syntax of the construction itself. That is, different outsider morphemes may appear in a particular construction, and which one appears depends on the outside information that calls it (Myers-Scotton, 2006).

4. Japanese morpheme classification in the 4-M model

This section attempts to classify Japanese morphemes based on the 4-M model. Free-standing independent morphemes could be considered content morphemes. They have an independent meaning or concept in themselves. Lexical categories of content morphemes include nouns, verbs, adjectives, adjectival nouns, adverbs, pronouns and discourse markers such as conjunctions and sentence-final particles. Note that in the MFL model, discourse markers such as *therefore, so, but,* are considered content morphemes at the discourse level. Myers-Scotton (2006) states that they do not assign thematic roles within the clause but they assign discourse-level thematic roles. She also refers to the fact that they frequently come from the EL in code-switching (CS). Sentence-final particles are not independent morphemes but, as discourse markers, they could be best considered content morphemes, because it is the speaker's intention to convey a certain message or attitude that results in their appearance. It is often shown that sentence-final particles are used with specific pragmatic functions (e.g. Takahashi, 1983; Nishimura, 1997; Patschke *et al*, 1999). Such morphemes could be considered conceptually activated. Similarly, the topic marker *wa* seems to be content morphemes because it is the speaker's intention to single out an accompanying noun as the topic of the sentence[10]. Furthermore, most prepositions are considered content morphemes in the MLF model (Myers-Scotton, 1993 [1997], 2006). Postpositions, which are the Japanese counterpart of prepositions in English, could also be content morphemes because they have their own content even though they are not independent morphemes. This analysis needs further consideration.

The candidates for early system morphemes are derivational suffixes (e.g. *-te, -sa,*) and prefixes (e.g. *su-, fu-, mu-, hi-*) (see 2.2). They add conceptual information to their heads (nouns). The suffix *su-*, for example, supplies the base noun with the meaning of bareness. The prefixes *fu-, hi-, mu-* add a negative meaning to the base noun. Such morphemes are indirectly

selected by the content morphemes which point to them. In the case of *fu-chuui* (careless), for example, the content morpheme *chuui* indirectly selects the early system morpheme *fu*. Other candidates for early system morphemes include verbal suffixes such as the causative *-(sa)se*, the passive *-(ra)re* and the desiderative *-tai* along with the past tense *-ta/da*, and the negative *-nai*. The addition of such morphemes conveys a different meaning from that of the verb on its own. They add content to their heads (verbs).

The candidates for bridge late system morphemes are the genitive case marker *no* and the coordinating particle *to* as in *Hanako no hon* (Hanako's book) and *otoko to onna* (man and woman. The copula (including its inflected forms) is another candidate for a bridge system morpheme as in *kirei na hito* (pretty person). These particles, along with the copula and its inflected forms, serve as bridges in that they integrate morphemes into larger constituents. The constituents are not well-formed without the bridge morphemes.

As stated earlier, the difference between bridges and outsiders is that bridges depend on well-formedness conditions that apply to the constituent in which they occur; they do not depend on anything else. Outsiders, however, do; their form depends on information outside the phrase in which they occur. Also bridges are invariant (i.e. a single allomorph of the morpheme) but outsiders are members of a paradigm (i.e. more than one allomorph of a morpheme). For example, in German, information from verbs or prepositions indicates the case marking that should appear on relevant parts in a noun phrase, notably determiners and adjectives. This makes the case markers outsiders—because they look outside the constituent in which they appear for information about their form. Similarly, case-marking particles (*ga, o, ni*) in Japanese depend on information outside the phrase in which they appear. For example, in *hon o yomu* (book ACC read,) the verb *yomu* (read) determines that the accusative case marker *o* should appear in the noun phrase, and in *Jon ni au* (John DAT meet), it is the verb *au* (meet) that requires the dative case marker *ni*. In *kare ga ki-ta* (he NOM come PAST), it is probably the past tense *ta* that calls for the nominative case marking. They are all information outside the relevant noun phrases. Thus, case particles in Japanese could also be considered outsider system morphemes like case in other languages such as German and Russian.

5. Conclusion

In this paper, I have attempted to classify Japanese morphemes using the 4-M model, which is a production-based model. The theory is based on the fact that system morphemes are

activated at two different abstract levels.

The distinction between conceptually activated morphemes and structurally assigned morphemes seems significant. Like content morphemes, early system morphemes are activated at the lemma level, whereas late system morphemes are not. Early system morphemes are selected or 'pointed to' by the lemma supporting the content morpheme at the conceptual level. Given the fact that the early system morpheme is activated with the content morpheme that supports it, the bond of indirect election between content morphemes and early system morphemes is hard to break. This would explain why some EL system morphemes are involved in single word CS[11]. They are early system morphemes.

The MLF model claims that all syntactically relevant system morphemes must come from the ML. 'Syntactically relevant' system morphemes are what the 4-M model calls 'late' system morphemes. In Japanese, it is case particles that are syntactically relevant (Takagi, 2006b). These particles were identified to be outsider system morphemes in the present classification.

For more complete classification, further investigation of the Japanese language is necessary in terms of language production. Also, the classification of Japanese morphemes presented in this paper needs to be tested with various language contact data, such as CS, L1/L2 acquisition and attrition.

Notes

1) Many proposals about the verb inflection of Japanese have been made by both Japanese and non-Japanese scholars. The details have been examined in Shibatani (1990). It should be noted that the notion of inflection in the case of Japanese is separated clearly from that of inflectional (or fusional) morphology. Morphologically, Japanese inflection assumes the form of agglutination of the Turkish type rather than the inflectional morphology of the Latin type (Shibatani, 1990).

2) In traditional Japanese grammar, this category is called *keiyoo-dooshi* (adjectival verb). Contrary to what the traditional term seems to suggest, members of this category are really more like nouns than verbs. Many grammarians refer to this category as nominal adjectives (e.g., Kuno, 1973), but I use the term adjectival nouns following Martin (1975), since these, unlike regular adjectives, take the copula *da*.

3) It is quite possible to analyze them as a sub-class of nouns. However, this paper treats verbal nouns as constituting an independent category, because when they occur with the dummy verb *suru* (do), the verbal noun with *suru* is regarded as a verb.

4) Tsujimura (2007) explains that postpositions, in general, bear an inherent meaning, whereas case-

marking particles do not. However, traditional Japanese grammar treats these particles as *kaku-joshi* (case-marking particles). This paper employs the distinction between postpositions and case-marking particles.

5) This type of code-switching (CS) is called 'tag-switching'.

6) Derivational morphemes are bound morphemes that may change the meaning and/or the category of the word to which they are attached (Tsujimura, 2007).

7) The hypothesis is this: relevant information in lemmas supporting surface-level morphemes does not all become salient at the same level of language production. Information supporting content morphemes and early system morphemes is salient in the mental lexicon, but information about late system morphemes does not become salient until the level of the formulator when larger constituents are assembled (Myers-Scotton, 2006: 268).

8) Lemmas are abstract entries in the mental lexicon which contain semantic, syntactic, pragmatic and morphological information (Levelt, 1989).

9) The formulator is viewed as an abstract mechanism that receives directions from lemmas in the mental lexicon. Directions from the lemmas underlying content morphemes and early system morphemes tell the formulator how to assemble larger constituents. Thus, the formulator's most important function is to assemble combinations of noun phrases and verb phrases, resulting in a full clause (Myers-Scotton, 2006).

10) The particle *wa* needs further consideration. It is identified as the focus marker as well as the topic marker depending on whether the stress is on the accompanying noun or not.

11) Such cases are observed in Takagi (2006b).

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