Introduction

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This Introduction provides a brief discussion of the characteristics of both spoken and written Japanese that will serve as background knowledge for readers who are not very familiar with the language. At the same time, we refer to specific chapters in this volume that are pertinent to the linguistic aspects under question whenever possible.

Characteristics of Japanese

Spoken Japanese

Sound system Japanese is a mora-timed language with a pitch accent system. A mora is a subsyllabic unit that determines the weight of a syllable. A regular mora is also a syllable, which is either V or CV. In addition, there are three types of morae (called special morae), which are perceived as having the same length as regular morae by Japanese speakers although they do not constitute syllables, viz. moraic consonants (i.e. the first part of geminate consonants or a moraic nasal), e.g. /Q/ in /kaQta/, /N/ in /hoN/, or the second half of a long vowel or a diphthong, e.g. /R/ of /keRki/. One mora also corresponds to one *kana* character in writing (see the section on written Japanese below). Unlike English, a language with a stress accent system, Japanese lexical accent is based on pitch, high vs. low, as shown below:

(1) a. ame "rain" (HL)
b. ame "candy" (LH)

The accents shown above are those of the Tokyo dialect. These accents do not change in speech within a dialect (e.g. they are not affected by intonation). Japanese phonetic and phonological correspondence is overviewed by Kubozono (chapter 26), and infants' speech perception and the acquisition of various phonological aspects are discussed by Hayashi (chapter 4) and Ota (chapter 5), respectively. Chapter 27 by Otake and chapter 28 by Venditti concern segmental and suprasegmental features in the processing of spoken

Japanese. The role of phonological structure in speech errors is discussed by Terao (chapter 29).

Parts of speech Japanese, like other languages, has nouns, verbs, adjectives, and adverbs. In the following example, *Taro* (name) is a proper noun while *hon* "book" is a common noun. *Katta* "bought" is a verb in the past tense and *totemo* "very" is a degree adverb modifying an adjective *takai* "expensive."

(2) Taro-ga totemo takai hon-o katta. "Taro bought a very expensive book."

These categories are similar to those found in English. As will be discussed below, Japanese allows subjects and objects to be unpronounced. Thus, a question arises: are verbs acquired earlier than nouns in Japanese? The acquisition of nouns and verbs is discussed by Imai (chapter 6) and Oshima-Takane (chapter 7).

Japanese also has another class of words: adjectival nouns (also referred to as nominal adjectives or *na*-adjectives). These behave like nouns, but have the semantic properties of adjectives. For instance, *fuben* "inconvenient" is an adjectival noun in (3a). Like the noun *basho* "place" in (3c), the copula *-da* (present tense) attaches to the adjectival noun in (3a), but when *fuben* modifies a noun, it has *-na* as in (3b), unlike the adjective ending *-i* as in *omoshiroi* "interesting" in (3c).

(3) a. fuben-da "[ ] is inconvenient."
b. fuben-*na* basho-da "It's an inconvenient place."
c. omoshiro*i* basho-da "It's an interesting place."

The similarity and dissimilarity of adjectives and adjectival nouns affect sentence production, and because of this second-language (L2) learners of Japanese often make errors. Studying these errors allows us to examine the production process of Japanese. Iwasaki (chapter 22) discusses Japanese sentence production referring to errors of prenominal modifiers and case particles.

Another interesting class of words is the verbal noun. Sino-Japanese verbal compounds are often created by attaching *-suru* "do" to verbal nouns. These are nouns that have some verb-like properties. For instance, observe below, where *kenkyu* is a noun meaning "research," *-no* is a genitive marker, and *-o* is an accusative marker.

(4) a. AIDS-no kenkyuu "research on AIDS"
b. AIDS-no kenkyuu-o suru "to do research on AIDS"
c. AIDS-o kenkyuu-suru "to research AIDS"
d. ?* AIDS-o suru

AIDS serves as an argument of *kenkyuu*. Since these verbal nouns have both nominal and verbal properties, their acquisition is an important issue, which is dealt with in chapter 8 by Sato and Yamashita.

Noun, verb, adjective, adverb, adjectival noun, and postposition all are lexical categories, while tense and aspect inflectional endings and complementizers appear in functional categories. How these different classes of words are treated in the brain is discussed in chapter 40 by Hagiwara.

Verb morphology The Japanese language employs agglutinative morphology for predicates and inflections (e.g. tense, aspect, mood, negative, interrogative, politeness, passive, and causative morphemes). For instance, verb roots require bound morphemes as shown below, which include instances of finite forms with nonpast and past-tense inflectional morphemes.

(5)

	Vocalic verb	Consonantal verb
Nonpast	mi-ru	kowas-u
Past	mi-ta	kowas-i-ta
Irrealis + Neg	mi-na-i	kowas-a-na-i
Adverbial + Auxiliary (Politeness)	mi-mas-u	kowas-i-mas-u
Continuitive	mi	kowas-i
Gerundive	mi-te	kowas-i-te

Vocalic verbal root *mi* "see" takes non-past-tense inflection *-ru* and consonantal verbal root *kowas* "break" takes *-u*. Both verbs take past-tense inflectional morpheme *-ta*. Because Japanese children must learn both vocalic and consonantal verbs and different inflectional and verbal morphemes, it is not easy for them to acquire this system all at once. How do they acquire it? Children's acquisition of tense–aspect is discussed by Shirai (chapter 11), and Sano (chapter 12) refers to children's errors in negation caused by the consonantal and vocalic differences in the verbal root.

Nominal and verbal marking Japanese also lacks agreement/marking of gender, number, and person on nouns and verbs. Thus, *yomu* "read" does not change its form despite the fact that the subjects differ, as in (6a)–(6c). Furthermore, the noun *hon* "book(s)" is ambiguous in (6a)–(6c). Even when numeral classifiers (also referred to as numeral quantifiers) appear with *hon* indicating a different volume of books, the form *hon* does not change as in (6d) and (6e).

(6)

a. Watashi-ga hon-o yomu.	"I read a book/books."
b. Taro-ga hon-o yomu.	"Taro reads a book/books."
c. Taro-to Hanako-ga hon-o yomu.	"Taro and Hanako read a book/books."
d. Watashi-ga issatsu hon-o yomu.	"I read one book."
e. Watashi-ga sansatsu hon-o yomu.	"I read three books."

The lack of morphological agreement makes it difficult in Japanese to detect which subject goes with which predicate, or whether a noun is a singular or plural. Thus, it makes one wonder how children can learn which predicate goes with which subject or how they identify the number/volume of the referent the noun designates. Although number is indicated by numeral classifiers, there are many classifiers in Japanese. For example, books are counted with *-satsu* as shown in the above examples, but pens are counted with *-hon/pon* and stones are *-tsu* or *-ko*. The use of different classifiers is difficult for children to learn. This is the topic of chapter 9 by Yamamoto. Finally, the lack of morphological markings (e.g. subject–aux/verb agreement) also brings a challenge to Japanese sentence processing because it increases ambiguities, i.e. it is more difficult to detect which noun goes with which predicate. See chapter 33 by Kamide and chapter 35 by Hirose.

Case particles English case is rarely phonologically realized, except in pronouns, such as *he*, *him*, and *his* in (7b). On the other hand, Japanese case is usually overtly expressed as particles that follow nouns, as shown in (7c).

(7) a. John showed Bob Bill's photos.
b. He showed him his photos.
c. John -ga Bob -ni Bill -no shashin-o miseta.
-NOM -DAT -GEN photo-ACC showed
"John showed Bob Bill's photos."

In the English example (7a), *John* would bear the Nominative case, but this fact is not phonologically clear. As seen in (7b), the pronoun *he* shows that the NP in this position bears the Nominative case. The Japanese example (7c), the counterpart of the English sentence (7a), shows that case particles (or case markers) appear after nominals. That is, *-ga*, *-ni*, *-no*, and *-o* indicate the phonological realizations of the Nominative case, the Dative case, the Genitive case, and the Accusative case, respectively. Japanese children must learn these particles. However, since some of the particles are often dropped, it is a challenge for children and L2 learners of Japanese to acquire the system. Morikawa (chapter 10) discusses children's acquisition of these case particles, and Iwasaki (chapter 22) and Terao (chapter 29) discuss case particle errors. Sasaki and MacWhinney (chapter 41) look at the interaction of case particle and other cues (e.g. word order, noun animacy) in the discussion of the competition model. Kanno (chapter 20) deals with the accessibility of Universal Grammar for L2 learners by referring to the issue of when case markers can be dropped and how L2 learners acquire such a condition. Since case particles indicate grammatical functions, they help the parser figure out the sentence structure. This is referred to by Kamide (chapter 33), Miyamoto (chapter 34), and Hirose (chapter 35).

Sentence-final particles Another type of particle appears typically in the sentence-final position. These are called sentence-final particles, which have either a semantic, pragmatic, or discourse function.

(8) a. Ashita ikimasu-ka? "Are you going tomorrow?"
b. Ashita ikimasu-ne? "You are going tomorrow, aren't you?"
c. Ashita ikimasu-yo. "I'm going tomorrow."
d. Ashita ikimasu-yo-ne? "You are going tomorrow, aren't you?"

Sentences in (8) include different sentence-final particles. (8a) contains the interrogative marker *-ka*. (8b) includes discourse marker *-ne*, creating a confirmation, while *-yo* in (8c) indicates strong assertion. As in (8d), more than one sentence-final particle can appear in the sentence, though the order is set. These particles have discourse functions. How these particles are acquired and used by children is one of the important issues. Note that some of these particles also appear sentence-medially following phrases as interjective particles. Though not interjective uses, the acquisition of the final particles is discussed by Cook (chapter 14).

Politeness The ending of the verb indicates politeness, as in (5) above. The verb "go/come" can be expressed in the following five ways: plain, polite, honorific plain, honorific polite, and humble forms in (9a), (9b), (9c), (9d), and (9e), respectively.

(9)

a. Ashita iku.	"I am going tomorrow."	(plain)
b. Ashita ikimasu.	"I am going tomorrow."	(polite)
c. Ashita irassharu?	"Are you coming tomorrow?"	(honorific plain)
d. Ashita irasshaimasu?	"Are you coming tomorrow?"	(honorific polite)
e. Ashita mairimasu.	"I am going tomorrow."	(humble polite)

These forms have to be learned through complex social situations; it therefore takes time for children to acquire the correct usage. See chapter 15 by Nakamura on the acquisition of politeness.

Constituent order One of the syntactic characteristics is the fact that Japanese is a head-final language, unlike English, which is a head-initial language. Consider the sentences in (10).

(10) a. Taro [ate an apple].
b. Taro -ga [ringo-o tabeta].
-NOM apple-ACC ate

As shown in (10a), the verb (i.e. the head of the verb phrase) precedes the direct object in English (SVO word order). However, it follows the object in

Japanese, as in (10b) (SOV word order). This means that the verb which carries the complement information, i.e. subcategorization information, comes first in English, whereas in Japanese it comes at the end of the sentence. What happens if one mixes these languages with different constituent order while speaking? Bilinguals do this. This is shown by Nishimura in chapter 25. The word-order difference also raises an interesting question regarding sentence processing: does a Japanese parser wait for the verb in order to build phrase structures? Kamide (chapter 33) includes the answer to this question. Furthermore, the constituent order affects how to use resources (e.g. working memory) in processing, as discussed by Nakayama, Vashisth, and Lewis in chapter 37. Chapter 38 by Osaka also concerns working memory.

Scrambling Although the Japanese basic constituent order is SOV, the preverbal constituent order can be reversed, i.e. word permutation. This phenomenon is called scrambling. English has a relatively rigid phrase structure, but as shown in (11), Japanese allows scrambling before the verb. "S" in the parentheses indicates the subject, "IO" the indirect object, "DO" the direct object, and "V" the verb.

(11) a. Jon -ga Mari -ni ringo-o ageta. (S IO DO V)
-NOM -DAT apple-ACC gave
"John gave Mary an apple."
b. Ringo-o Jon-ga Mari-ni ageta. (DO S IO V)
"An apple John gave Mary."
c. Mari-ni Jon-ga Ringo-o ageta. (IO S DO V)
"*Mary John gave an apple."
d. Jon-ga Ringo-o Mari-ni ageta. (S DO IO V)
"*John gave an apple Mary."
e. Mari-ni Ringo-o Jon-ga ageta. (IO DO S V)
"*Mary an apple John gave."
f. Ringo-o Mari-ni Jon-ga ageta. (DO IO S V)
"*An apple Mary John gave."

The Japanese examples in (11) demonstrate any order of NPs before the verb. On the other hand, the English counterparts in (11c) and (11d) show that the indirect object cannot appear before *John* and after *an apple*, and both indirect and direct objects cannot appear together before *John*, as in (11e) and (11f). Note that scrambling is different from right dislocation, which is a root phenomenon. In right dislocation constructions, the dislocated element appears after the verb as an afterthought, as in (12a).

(12) a. Jon-ga Mari-ni ageta, ringo-o.
"An apple Mary John gave."

b. Ringo-o Taro-ga Jon-ga Mari-ni ageta-to omotta.
"Apples, Taro thought that John gave them to Mary."

However, scrambling is not a root phenomenon. Though rare, it allows long-distance scrambling as in (12b). Scrambling is discussed in chapter 34 by Miyamoto, chapter 36 by Sakamoto, and chapter 39 by Yamashita and Chang.

Relative clauses Another characteristic of Japanese is that relative clauses employ prenominal modification, and do not have relative pronouns (such as English *who*). Although some relative pronouns can be deleted in English, the fact that there are no relative pronouns at all and no distinct morphological markings on relative clause verbs as in (14b), in addition to the head-last nature, makes the processing of Japanese relative clauses rather difficult because finding the clause boundaries is difficult, particularly in reading. This is discussed by Hirose (chapter 35). However, the processing of spoken Japanese is not as difficult as reading because there are some prosodic cues, as discussed by Venditti (chapter 28) and Hirose (chapter 35).

(13) a. John gave Mary an apple.
b. John saw [the child [who gave Mary an apple]].

(14) a. Jon -ga Mari -ni ringo-o ageta.
-NOM -DAT apple-ACC gave
b. Jon -ga [[Mari-ni ringo-o ageta] kodomo]-o mita.
-NOM -DAT apple-ACC gave child-ACC saw

Null arguments Japanese permits different kinds of empty categories. Among them, Japanese has phonologically null argument NPs in tensed clauses (null or empty pronouns, often referred to as pro-drop, or null arguments), unlike English. Consider sentences (15) and (16), in which [e] represents a null pronoun.

(15) a. *John hit [e].
b. *[e] hit Bill.
c. *[e] hit [e].

(16) a. Jon-ga [e] tataita.
-NOM hit
"John hit him/her/it/them."
b. [e] Biru-o tataita.
-ACC hit
"He/she/they hit Bill."
c. [e] [e] tataita.
"He/she/they hit him/her/it/them."

In the English tensed clauses, null pronouns cannot appear in either subject or object position, as shown in (15). On the other hand, null pronouns are allowed in both positions in Japanese, as seen in (16). Sakamoto (chapter 36) discusses the interpretation of another type of null pronominal that occurs in an untensed clause (often called PRO), whose reference is controlled by the subject or the object of the matrix clause. Referentially dependent nouns like null pronouns as well as overt referentially dependent nouns such as *zibun* "self" are discussed in chapter 13 by Lust and chapter 21 by Thomas.

Narrative structure and discourse Sequences of words create sentences and sequences of sentences reveal narrative or discourse structure. In storytelling, there are both universal and culture-specific characteristics. Japanese narrators often share common ground with listeners and facilitate turn exchanges. Thus, a limited number of utterances over turns is observed. The acquisition of these narrative structural characteristics is discussed by Minami (chapter 16) and the characteristics of caregivers' speech are discussed by Murase and Ogura (chapter 2). In chapter 17 Naka discusses the reliability of children's stories based on their memory.

Spoken Japanese leaves other important issues that are not mentioned above. The ontogeny of language is discussed by Masataka (chapter 1), and the relationship between gesture and speech is explained by Furuyama (chapter 44) and by Ejiri and Uchida (chapter 3). Though not expressed orally, the same kind of linguistic properties including phonological features are found in sign languages. Japanese sign language is no exception. In chapter 19 Torigoe provides a look at the current research in Japanese Sign Language.

All linguistic analyses are conducted within certain theoretical frameworks. Sasaki and MacWhinney (chapter 41) and Negishi (chapter 42) present successes in particular theoretical models such as a competition model and a connectionist model, respectively. Finally, a computational approach to language analysis is discussed by Asahara, Den, and Matsumoto (chapter 43).

Written Japanese

Orthography There are two kinds of characters in Japanese, *kana* and *kanji*, besides *roomaji* or romanization. *Kana* is a moraic script form, and there are two kinds, *hiragana* and *katakana*. In present-day Japanese, *hiragana* (cursive *kana*) is primarily used to indicate high-frequency morphemes such as particles, postpositions, and inflectional endings. *Katakana* (square *kana*) is used for all loanwords except those of Chinese origin. It is also used for emphasis (e.g. onomatopoetic words and foreigners' conversations in comics). Since these script forms are moraic, their script–sound correspondence is highly

regular. There are 46 basic *kana* (71 with the use of diacritics, used for voicing, for example). *Kanji* or Chinese characters, on the other hand, do not have regular script–sound correspondences. They are primarily used for nouns, and the roots of adjectives and verbs. There are 1,945 daily-use *kanji* (or *jooyoo kanji*), most of which are taught during the nine-year compulsory education. Normally, both *kana* and *kanji* are used together in a sentence. For instance, the same sentence can be written in four ways, as shown in (17).

(17) a. Jon-ga hon-o yomu. "John reads books."
John-NOM book-ACC read
b. じょんがほんをよむ。
c. ジョンガホンヲヨム。
d. ジョンが本を読む。

Sentence (17a), which is written in *roomaji*, can be written in *hiragana*, as in (17b), in *katakana*, as in (17c), and mixed script (*hiragana*, *katakana*, and *kanji*), as in (17d). The standard way of writing is (17d), in which the noun corresponding to *John* is written in *katakana*, *hon* "book" and a part of the root of the verb *yom* "read" in *kanji*. Case particles *-ga* and *-o*, and a part of the root of the verb and tense inflection *mu* are in *hiragana*. Although the actual root of the verb "read" is *yom*, the *yo* portion in written in *kanji* (読), while *mu* is written in *hiragana* (む) because the readings of *kanji* and *kana* are moraic. Sentences are written vertically (top-down, right to left) or horizontally (left to right, top-down). Generally speaking, vertical writing is more formal and often employed in newspapers and formal letters and documents (e.g. essays, language textbooks), while horizontal writing is often found in contemporary governmental documents and scientific work. Horizontal writing is frequently found in readings in social and natural sciences.

Because of the complicated physical composition of *kanji* characters and their multiple readings, many researchers are engaged in the investigation of the visual recognition process of *kanji*. See chapter 31 by Saito on orthographic process as well as chapter 32 by Wydell on different lexical access theories. Frequency and familiarity of a certain orthographic representation affect lexical access. This is discussed by Kondo and Mazuka (chapter 30). Also the different orthographic representations bring a challenge to L2 learners of Japanese, as discussed by Koda (chapter 23). Certain letters bring some difficulties to readers with developmental dyslexia. This issue is dealt with by Yamada (chapter 18). Finally, reading is a complex activity that requires not only decoding of the characters but also the processing of different aspects of linguistic knowledge with information encoded in the linguistic

representations. Horiba discusses this complicated activity in L2 Japanese in chapter 24.

This introduction has provided a brief outline of some characteristics of the Japanese language that are discussed in this volume. We hope it serves as background for the individual chapters that are referred to. Please note that the topics of the chapters mentioned are rather limited and the chapters also discuss other issues that are not dealt with in this introduction.