A pragmatic account of scrambling and topicalization in Japanese

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Received 30 April 2016; received in revised form 15 January 2017; accepted 4 April 2017
Available online 17 April 2017

Abstract

The purpose of this study is to explore the interactions between word orders and particles in Japanese transitive sentences in terms of information structure. To this end, a series of corpus analyses within the framework of the Givónian approach were conducted. Based on the present corpus analyses, I propose that scrambling is chosen when the scrambled object is anaphorically prominent but cataphorically non-prominent, and that topicalization is selected when the direct object is anaphorically and cataphorically prominent. Additionally, I arrive at the conclusion that word order permutations in Japanese are applied to intermediately accessible referents. In other words, word order changes are neither used with highly accessible referents, nor completely new information.
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Keywords: Word order; Discourse analysis; Corpus analysis; Japanese; Information structure; Givónian approach

1. Introduction

In some inflected languages such as Japanese and Korean, where syntactic and semantic functions are indicated by a rich morphological system, subject and object can change positions without affecting grammatical relations between constituents. Japanese, for example, allows not only SOV order but also OSV order, as shown in (1). Based on the morphologically marked case information, namely the nominative case marker GA and the accusative case marker O, native Japanese speakers can interpret OSV order appropriately. Moreover, the nominative case marker GA and the accusative case marker O can be replaced by the topic marker WA without changing the propositional content, although NP TOP NP TOP V can be construed only as SOV here because case information and animacy information are not useful in the sense that both the subject and the object are WA-marked and human nouns. Thus, the speaker must select a word order and a combination of particles in order to convey his or her intention.

(1) a. Taro-ga/wa Jiro-o/wa oikake-ta. SOV
   Taro-NOM/TOP Jiro-ACC/TOP chase-PAST
   ‘Taro chased Jiro.’

   b. Jiro-o/wa Taro-ga/wa oikake-ta OSV
   Jiro-ACC/TOP Taro-NOM/TOP chase-PAST
   ‘Taro chased Jiro.’

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http://dx.doi.org/10.1016/j.lingua.2017.04.002
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Why do languages allow different options to convey the same message? One explanation is that they enable speakers to choose the way information is transmitted to the hearer. The difference between (1a) and (1b) is not what is said about the world but the way it is packaged (Chafe, 1976; Lambrecht, 1996; Vallduví and Engdahl, 1996). Chafe (1976:28) uses ‘the term packaging to refer to the kind of phenomena at issue here, with the idea that they have to do primarily with how the message is sent and only secondarily with the message itself, just as the packaging of toothpaste can affect sales in partial independence of the quality of the toothpaste inside’.

There is a general consensus that marked options are more strictly constrained by discourse contexts than unmarked options (Aissen, 1992; Imamura et al., 2014, 2016; Kuno, 1987, 1995; Koizumi et al., 2014). Since word order changes are marked options, they are considered to require specific contexts. However, it is unclear what kind of meaning word order changes have. What kind of context, then, is needed to select OSV in Japanese? Furthermore, what will happen if the case particle is substituted for the topic marker WA? In order to disentangle these issues, I survey the interplay between word order permutations and particles on the basis of a corpus analysis.

Why is corpus analysis selected for the present study? There are two main reasons for this. One reason is that pragmatic principles are usually proposed as general tendencies and not as predictive principles (Jucker and Taavitsainen, 2013:5). To this end, corpus analysis is a desirable choice because we can observe some tendencies on the basis of quantitative data. The other reason to select the corpus analysis is that corpus analyses can provide objective data and their results are reproducible.

Although I stated that the present study examines word order changes and particles in terms of information structure, the concept ‘information structure’ is a very broad concept, which includes topic, focus, contrastiveness, givenness, etc. Therefore, it is necessary to somewhat narrow down the scope of information structure. To meet this purpose, the present study employs a framework called the Givónian approach. This approach is compatible with corpus analyses because it is a quantitative approach.

This paper is organized as follows. Section 2 overviews previous studies regarding word orders and particles. Specifically, scrambling and topicalization are focussed here. In addition, the framework of the Givónian approach is accounted for. Section 3 lays out the methodological foundations applied for the analyses. This section gives an explanation of the balanced corpus of contemporary written Japanese and provides the explanation of search procedure to assemble relevant data. Section 4 provides a corpus analysis of scrambling and topicalization. Based on the results, I reach the generalization that scrambling is selected when the scrambled object is anaphorically prominent but cataphorically non-prominent, whereas topicalization anticipates ‘continuing topic’ as the referent of the object. Furthermore, it is proposed that moved elements in Japanese are apt to be immediately accessible information. Section 5 is devoted to the conclusion and further studies.

2. Previous studies

2.1. Scrambling

It has been proposed in syntax that the direct object in \(O_{\text{ACC}}S_{\text{NOM}}V\) is moved from the VP-internal position to the beginning of the clause (Koizumi and Tamaoka, 2010; Miyagawa, 2001, 2003, 2010; Saito, 1985, 2009; Saito and Hoji, 1983). This grammatical operation is named ‘scrambling’. The key point here is that scrambling does not bear upon grammatical relations between the predicate and the arguments. For example, both \(S_{\text{NOM}}O_{\text{ACC}}V\) (2a) and \(O_{\text{ACC}}S_{\text{NOM}}V\) (2b) convey the same proposition Taro found the key. The difference between (2a) and (2b) derives from how information is transmitted to the addressee, not the propositional meaning itself.

(2)

2a. \(S_{\text{NOM}}O_{\text{ACC}}V\)

Taro-ga kagi-o mitsuke-ta.
Taro-NOM key-ACC find-PAST
‘Taro found the key.’

2b. \(O_{\text{ACC}}S_{\text{NOM}}V\)

kagi-o Taro-ga mitsuke-ta.
key-ACC Taro-NOM find-PAST
‘Taro found the key.’

In theory, \(S_{\text{NOM}}O_{\text{ACC}}V\) is reckoned as the most unmarked word order whereas \(O_{\text{ACC}}S_{\text{NOM}}V\) is regarded as the marked one because it includes a scrambling movement. It is well-known that unmarked options can be employed in many situations properly whereas marked options can be used only when supportive contexts are provided (Aissen, 1992; Imamura et al., 2014, 2016; Kuno, 1987, 1995; Koizumi et al., 2014). What is a suitable context for \(O_{\text{ACC}}S_{\text{NOM}}V\)?
According to Kuno (1978:54), word order choice depends on given-new ordering, which means that given information is mentioned early and new information later. Hence, native Japanese speakers are thought to select OSV when the scrambled object is given information and the subject is new information. Furthermore, Imamura (2014, 2015, 2016) has demonstrated using corpus analysis that the direct object in OSV are apt to be given information because they have their antecedents in preceding discourse generally. In processing, Imamura et al. (2014, 2016) revealed on the basis of a sentence comprehension experiment that given-new ordering reduced the processing cost of $O_{ACC}\text{S}_{NOM}V$. Taken together, the direct objects of OSV tend to be given information in Japanese.

Numerous studies have reported that given-new ordering has significant effects on word order permutations in many languages as shown in Bock and Irwin (1980) for English, Birner and Majothing (1996) for Farsi, Hoffman (1998) for Turkish, Kaiser and Trueswell (2004) for Finnish, Kizach and Balling (2013) for Dutch, Kuno (1978) for Japanese, Rambow (1993) for German, Siewierska (1993) for Polish, and Vasishth et al. (2012) for Hindi. Yet, to my knowledge, no study has examined the connection between word order changes and the succeeding discourse contexts in Japanese in terms of information structure. Which referent (S or O) is more likely to be taken over to the succeeding discourse after $O_{ACC}\text{S}_{NOM}V$ in Japanese? With regard to this issue, there are two possibilities. The first possibility is that the referent of the subject is prone to be mentioned more frequently than that of the object in the succeeding discourse. This prediction relies on the view that grammatical hierarchy has a large impact on the choice of the referent in the following sentences; the subject inclines to be the locus of the succeeding sentences after OSV because its ranking is higher than that of the object (Kameyama, 1985; Walker et al., 1994). In centering theory, it has been presupposed that speakers draw on referents from their current utterance to frame their next one. These referents are called forward-looking centers (Cfs), which are defined as members of an ordered set of referents corresponding to referents mentioned in the current utterance. They are a list of all discourse entities in a sentence that may be linked to a subsequent utterance. The set of Cfs is ordered by salience, ranked most often in terms of a hierarchy of grammatical relations: SUBJECT is higher than OBJECT which is higher than OTHER constituents. Note that grammatical or zero topics ‘are more prominent than grammatical subjects and objects in Centering analysis’ (Sakurai, 2007:244), and thus WA-marked elements are expected to be ranked higher than SUBJECT and OBJECT. The ranking of Cfs corresponds to the likelihood for them to become the center in the immediately following utterance. The center of a sentence is the referent which has the direct link with the immediately preceding sentence and can be defined as what the sentence is about. The second possibility is that the referent of the object is carried over to the succeeding discourse compared to that of the subject. This prediction depends on the idea that word order is the main determinant of the choice of the center in the succeeding discourse (Strube and Hahn, 1999; Gordon et al., 1993). According to this position, scrambled objects are more liable to appear in the following discourse because they precede their subjects in linear order. One aim of the current study is to explore which prediction is on the right track, based on the corpus analysis within the framework of the Givónian approach.

In a nutshell, it has been reported that scrambling is affected by given-new ordering. However, it is not clear which referent tends to be transferred to the following sentences. In fact, ‘As for Japanese, no studies have examined yet whether scrambling affects Centering algorithm at all. Therefore, it is not known yet if an utterance in a scrambled word order still follows the Japanese Cf ranking or if scrambling actually affects any Centering algorithm’ (Sakurai, 2007:249). Thus, I inspect the relationship between scrambling and the succeeding sentences in terms of the Givónian approach.

2.2. Topicalization

In Japanese, the nominative case marker GA and the accusative case marker O can be replaced by the topic marker WA (Iwasaki, 2002:44). Thus, OSV can be described by $O_{TOP}\text{S}_{NOM}V$, as in (3). This construction is termed ‘topicalization’.

3) sono-ring-wa John-ga tabe-ta
   the-apple-TOP John-NOM eat-PAST
   ‘The apple, John ate.’

Within the framework of syntax, Kuroda (1987) maintains that $O_{TOP}\text{S}_{NOM}V$ is derived by moving the WA-marked object to the sentence-initial position. In this sense, $O_{TOP}\text{S}_{NOM}V$ is a syntactically marked option compared with SOV. In terms of frequency, Imamura and Koizumi (2011) revealed that the frequency of $O_{TOP}\text{S}_{NOM}V$ is significantly lower than that of SOV. In light of information structure, Mak et al. (2008) argue that topical referents are apt to be realized as subjects. It must be noted that $O_{TOP}\text{S}_{NOM}V$ does not follow this tendency because the topical referent is realized as the object. In short, $O_{TOP}\text{S}_{NOM}V$ is a marked option, which requires a specific context just as $O_{ACC}\text{S}_{NOM}V$ does. To our knowledge, however, no studies have investigated the licensing contexts for $O_{TOP}\text{S}_{NOM}V$ in terms of givenness.

It is noteworthy that both scrambling ($O_{ACC}\text{S}_{NOM}V$) and topicalization ($O_{TOP}\text{S}_{NOM}V$) contain a syntactic movement, but they are different from each other in that the former chooses the accusative case marker O and the latter selects the topic
marker WA. Does this difference lead to the functional differences between them? One aim of this work is to scrutinize both the similarities and differences in their function in terms of information structure.

2.3. Particles

It has been traditionally considered that the usages of WA and GA depend to a large degree on given-new distinction; topic marker WA is apt to be associated with given information while nominative case marker GA tends to be pertinent to new information\(^1\) (see e.g. Chafe, 1970, 1976; Hinds, 1984; Kuno, 1972, 1973a,b; Matsushita, 1930; Mikami, 1963; Ono, 1973). Let us illustrate this analysis by looking at (4). In (4b), the subject kare ‘he’ is more compatible with the topic marker WA than with the normative case marker GA.\(^2\) It should be noted that kare in (4b) is given information because he was referred to in the immediately preceding sentence (4a). In consequence, the discourse status of the subject conflicts with the function of GA, creating an unacceptable sentence. On the other hand, since the subject is given information in (4b), it coincides with the function of WA, leading to an acceptable sentence.

   John-NOM (me) visit-and came-PAST
   ‘John called on me.’
   b. kare-*ga/wa omiyage-ni kudamono-o Ø kuremashi-ta.
      he-NOM/TOP present-as fruits-ACC (me) give-PAST
      ‘He gave me fruits as a present.’
      (Kuno, 1972:276)

Under the framework of the Givónian approach, Hinds (1983) demonstrated that the nominative case marker GA revealed the least amount of topic continuity because the GA-marked NPs are far away from their nearest antecedents or do not have their antecedents in general, being consistent with its role as an indicator of new information. Zero pronouns were the most continuing option because they tend to have their antecedents in the immediately preceding context, showing their role as a continuation of the same topic in discourse. Topic marker WA was an intermediate category between nominative case marker GA and zero pronouns. The same tendency was observed by Shimojo (2005) on the basis of spoken Japanese.

2.4. Interactions between word order changes and particles

Saito (2012) pointed out that word order changes have an influence on the interpretation of topic marker WA. In SOV like (5a), as Kuno (1973a) notes, only sentence initial WA can be interpreted as a thematic topic. Thus, WA-marked object, sono hon ‘that book’, must be interpreted as contrastive, not as thematic, because it is placed in the non-sentence initial position. However, in OSV like (5b), when the WA-marked direct object is moved toward the sentence initial position, both the subject and the direct object can have a thematic interpretation. This means that the interpretation of the direct object is affected by moving it toward the beginning of the sentence.

(5) a. Taro-wa (kyonen) sono hon-wa katta.
   Taro-TOP last year that book-TOP bought
   A. ‘Speaking of Taro, he bought that book (last year), but I don’t know about other books’ (Taro = Thematic, that book = contrastive)
   B. ‘Taro bought that book (last year), but I don’t know about other people and other books’ (Taro = contrastive, that book = contrastive)
   b. sono hon-wa Taro-wa (kyonen) katta.
      that book-TOP Taro-TOP last year bought
      A. ‘Speaking of that book, Taro bought it (last year), but I don’t know about other people’ (that book = thematic, Taro = contrastive)

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\(^1\) Kuno (1972:270) points out that WA is not necessarily anaphoric (i.e. previously mentioned) when it is interpreted as contrastive. This signifies that contrastive WA can express both given and new information.

\(^2\) GA-marked elements are not necessarily discourse-new information. Maynard (1987:62) points out that ‘GA is attached to indicate new information not in the sense that it cannot have been previously mentioned, although it is often the case that it has not been, but in the sense that the speaker presents it as not being currently activated in the reader’s consciousness’. Furthermore, GA-marking may be repeated for a particular discourse effect. For example, the discourse-old referent can be ‘introduced as if new, being marked by GA’ (Maynard, 1987:73).
B. ‘Speaking of Taro, he bought that book (last year), but I don’t know about other books’ (Taro = thematic, that book = contrastive)
C. ‘Speaking of that book and speaking of Taro, he bought it (last year)’ (that book = thematic, Taro = thematic)
D. ‘Taro bought that book (last year), but I don’t know about other books and other people’ (that book = contrastive, Taro = contrastive)

(Saito, 2012:158–9)

In summary, word order permutations and particles interplay to represent a range of pragmatic functions. The aim of the present study is to study the interactions between word orders (SOV vs. OSV) and particles (case markers GA and O vs. topic marker WA) under the Givónian theoretical framework.

2.5. Givónian approach

2.5.1. What is the Givónian approach?

There are two major concepts proposed by Givón (1983, 1988, 1990, 1994) in order to measure the prominence of referents quantitatively: Referential Distance (RD) and Topic Persistence (TP). Roughly speaking, RD assays anaphoric prominence of the referents. The metric of RD calculates the distance between a referent in the current clause and its nearest antecedent in the preceding clauses, using clause boundaries as units. Following Givón (1983), the upper boundary for RD is arbitrarily settled as the preceding 20 clauses. It must be noted that it is a standard analysis to employ 20 as the maximum number of RD when analyzing Japanese in the framework of a Givónian approach (Imamura, 2014, 2015, 2016; Hinds, 1978, 1982, 1983; Hinds and Hinds, 1979; Shimojo, 1995, 2005, 2006; Watanabe, 1989). If the coreferential antecedent is observed within the 20 previous clauses, the RD value is allocated to the target referent in accordance with ‘the number of clauses separating its present occurrence from its last occurrence from the preceding text’ (Givón, 1994:10). On the other hand, if no antecedent is found within the preceding 20 clauses, RD is assigned a value of 20. One reason for this is that RD would be infinite without some limitation. Thus, RD values vary from 1 to 20; 1 means a referent which has its antecedent in the immediately preceding clause and 20 signifies a referent whose antecedent is more than 20 clauses away from it or has no antecedent within the preceding 20 clauses. The examples whose RD values are low are considered to be more activated than the examples whose RD values are high (Shimojo, 2005:72). Next, let us move on to the notion of TP. TP was proposed so as to calculate the decay of information in the cataphoric context. In order to measure cataphoric prominence of the referents, TP counts the number of clauses in the succeeding 10 clauses in which the referent re-occurs (Imamura, 2016; Givón 1994; Hinds, 1983; Shimojo, 1995, 2005, 2006). Therefore, the value of TP is expressed by some number of clauses from 0 to 10.

In order to illustrate the concepts of RD and TP, let us look at (6). For assessing the RD of I in (6e), you need to confirm whether it has an antecedent in the preceding sentences. By doing this, you will find I in (6a), (6b), and (6c). Since I in (6c) is the nearest antecedent for I in (6e), you need to count the number of clauses between (6c) and (6e). Consequently, the RD of I in (6e) is assigned 2. With regard to the measurement of TP of I in (6e), you need to check whether the succeeding 10 clauses contain the co-referential expression. As a result, you will find out that the referent of I is included in (6f), (6i), (6j), (6m), (6n), and (6o). Therefore, the TP of I in (6e) is 6. It should be pointed out that I in (6q) occurs outside the scope of TP analysis for I in (6e) because it is too distant from I in (6e).

(6) a. When I was a child,
b. I was a bookworm.
c. One day, I went to an old library,
d. which was located at a strange hill.
e. When I entered the reading room,
f. a librarian spoke to me.
g. She said
h. that the closing time was coming up.
i. So, I had to leave the room very soon.

3 TP can be defined in at least two different ways – (i) frequency of mention and (ii) uninterrupted reference. In the former, persistence is defined in terms of how many times a given referent occurs in a certain range of cataphoric discourse, and in the latter, how far into the cataphoric context there is continuous reference for the referent in question (Shimojo, 2006:132). In the current study, the former definition is employed for the simplicity of procedure. With regard to the latter criterion, there are several problems about how to deal with subordinate clauses (Shimojo, 2005:99–101). In order to avoid this problem, the former definition is selected in the current study.
j. I opened the door,
k. but it led to a strange place.
l. Something was strange.
m. Then, I realized
n. that I went into a parallel world.
o. As far as I could see,
p. there were shining stars on the ground.
q. In consequence, I was moved upward by gravity.

Under the framework of the Givónian approach, many concepts have been proposed in order to measure the discourse status of a referent. However, only RD and TP survived the past decades. Therefore, RD and TP are used for investigating the interactions between word order changes and particles in Japanese.

2.5.2. Why the Givónian approach?
From the early Prague School proposals to current studies, numerous studies have examined the interplay between discourse and grammar. Specifically, it has been observed across many languages that human languages tend to arrange constituents so that given information precedes new information. All the other things being equal, the speaker prefers beginning a sentence from what is known to what is not known. Although there is a general consensus that given information tends to come earlier than new information, the definition of givenness has been controversial for many years. Indeed, there are many approaches about how to define givenness. Firstly, it is possible to define givenness as ‘shared knowledge’ between the speaker and the hearer; when ‘the speaker assumes that the hearer ‘knows’ or can infer a particular thing but is not necessarily thinking about it’ (Prince, 1981:230). Secondly, givenness can be defined in terms of ‘saliency’; ‘the speaker assumes that the hearer has or could appropriately have some particular thing/entity/...in his/her CONSCIOUSNESS at the time of hearing the utterance’ (Prince, 1981:228). Fourth, givenness can be defined in terms of ‘predictability or recoverability’; the speaker assumes that the hearer can predict or could have predicted that a particular linguistic item will or would occur in a particular position within a sentence (Prince, 1981:226).

All of these definitions are to some degree subjective in that they depend on speaker-assumptions. It is hard to judge on the basis of discourse contexts whether the hearer ‘could have predicted’, ‘knows or can infer’, or is ‘conscious of’ the element in a sentence. In analytical contexts, you will have to make difficult decisions concerning the degree of givenness of the referents. Hence, it might make more sense to put these definitions aside for the time being and to develop concepts which are more operational. As a first step toward this, Givón (1990), Givón (1983, 1988, 1994)’s approach is employed in this study. Instead of depending on the mental status of the participants in the discourse, he takes only textual criteria into account. Although Givón (1990:897) accepts the view that given information is assumed by the speaker to be ‘accessible’ to the hearer, he points out that it is difficult to calculate or quantify givenness directly. Therefore, his approach attempts to measure givenness indirectly from the text itself. This is because given information is equated with high referential accessibility within the text. The core intuition around what it means for a referent to express given information is that the referent is already entailed by the discourse. According to the Givónian approach, the elements once mentioned in the preceding contexts are considered to be given information because textual counts are associated with assumed givenness i.e. shared knowledge, saliency, and predictability. The advantage of this approach is that counting is evident and uncontroversial and thus the results of Givónian analyses are easily replicable both within and across languages. Actually, two important concepts, RD and TP, are well-recognized measurements that are implementable without difficulty and their employment renders the results of my analysis more reproducible. This also signifies that my analyses can be compared to the achievements of previous studies directly because many studies have investigated Japanese on the basis RD and TP (Hinds, 1978, 1982, 1983; Hinds and Hinds, 1979; Shimojo, 1995, 2005, 2006; Watanabe, 1989). Furthermore, Givónian approach can calculate the subtle differences in givenness between the referents because it can assess the degree of accessibility of referring expressions. Lastly, this approach is compatible with corpus analysis because it measures the discourse status of the referents on the basis of text data. This leads to an objective description of grammatical operations. For the above reasons, the present study inspects the interplay between word orders and particles from a viewpoint of the Givónian approach.

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4 Prince’s saliency corresponds to Chafe (1987:25)’s activation of information. An active concept is one that is currently lit up, a concept in a person’s focus of consciousness at a particular moment.
3. Corpus analysis

3.1. Basic purposes and procedures

The goal of this analysis is to disclose the interplay between word order changes and particles in terms of information structure using the Givónian approach. To this end, RD and TP values were measured for both the subject and the object in SOV and OSV. By comparing SOV with OSV, focusing on particles, the discourse effects of OSV and particles can be calculated accurately.

3.2. Method

3.2.1. Corpus data

Relevant data were collected from the Balanced Corpus of Contemporary Written Japanese (BCCWJ), which is designed to be maximally representative of contemporary written Japanese by randomly assembling 100 million words from well-balanced written materials covering books, magazines, newspapers, library books, white books, bulletin boards, blogs, best-selling books, school textbooks, minutes of the National Diet, publicity of newsletters of local governments, laws, and poetry verses (see Maekawa et al., 2008 in detail).

3.2.2. Materials

There are five conditions in the present study: $S_{\text{NOM}}O_{\text{ACC}}V$, $S_{\text{TOP}}O_{\text{ACC}}V$, $O_{\text{ACC}}S_{\text{NOM}}V$, $O_{\text{TOP}}S_{\text{NOM}}V$, and $O_{\text{ACC}}S_{\text{TOP}}V$.

3.2.3. Search procedures

The RD and TP values of the subject and the object were measured in order to assess the discourse status of the referents. Randomly selected 100 examples for each condition were used for the analysis. All the examples were collected from BCCWJ by using Chūnagon, which is a web interface program. One of the distinct characteristics of this program is that it can make use of morphological information so as to extract each example. However, it cannot pick up examples by making the most of syntactic information due to the intrinsic property of BCCWJ. Notice that BCCWJ does not include syntactic information about grammatical functions. Since Chūnagon is based on BCCWJ, it is impracticable to extract examples by using grammatical relations between arguments and the predicate. Instead of relying on grammatical functions such as the subject and the object, it was necessary in the present study to depend on the linear order among the nominative case marker GA, the accusative case marker O, and the topic marker WA. For example, $S_{\text{NOM}}O_{\text{ACC}}V$ sentences such as (7) were gathered from BCCWJ by searching for sentences with the nominative case marker GA followed by the accusative case marker O.

(7) $S_{\text{NOM}}O_{\text{ACC}}V^5$

<table>
<thead>
<tr>
<th>watashi-ga</th>
<th>kuruma-o</th>
<th>untenshitei-ta-toki-wa...</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-NOM</td>
<td>car-ACC</td>
<td>drive-PAST-when-TOP</td>
</tr>
</tbody>
</table>

‘When I drove a car...’

(BCCWJ)

One of the strong points of Chūnagon is that it can extract examples with long contexts, whose maximum number of the preceding or the succeeding contexts is 500 words. This length is enough for my analysis because my approach counts on the Givónian approach, which requires 20 preceding clauses and 10 following clauses in order to calculate the discourse status of a certain referent.

3.3. Calculation of RD and TP

In order to standardize the quality of the data, the norm for the identification of referents is needed. To this end, several criteria are proposed on the basis of Imamura (2014, 2015) and Shimojo (2005). The following sections are dedicated to expounding these criteria.

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5 This example is a clausal topic, but it is categorized into $S_{\text{NOM}}O_{\text{ACC}}V$. This is because the present study does not distinguish main clauses from subordinate clauses.
3.3.1. Bridging relationships

It is considered that some inferable entities belong to given information. More specifically, bridged referents should be categorized into given information because they are partly shared knowledge. In definition, bridging is an inference from an element explicitly mentioned in the previous discourse. Functionally, bridged referents are connected with the preceding discourse by the inference. A typical example of bridging is shown in (8). (8b) includes the presupposition that ringo ‘apple’ is a part of kudamono ‘fruits’ in (8a). The reader must connect ringo in (8b) with kudamono (8a) in order to interpret (8b) appropriately. This is an exemplary example of bridging because ringo is not directly mentioned in the preceding sentence but is indirectly linked with the entity which appeared in the previous discourse. Since there is a bridging relation between ringo and kudamono, kudamono can be regarded as the antecedent of ringo. Considering this example from the standpoint of the Givónian approach, the RD of ringo is 1.

(8) a. Taro-wa kinō kudamono-o katta
   Taro-TOP yesterday fruit-ACC buy-PAST
   ‘Taro bought fruit yesterday.’
   b. shikashi, ringo-wa kusatte-ita.
   but apple-TOP rotten-were
   ‘But the apples were rotten.’

(Imamura, 2014:227)

Of course, there are some problematic cases where it is difficult to make a judgment about the coreference. In order to deal with the problem of coreference, discourse contexts are maximally made use of. Let us have a look at example (9). Normally, Jesus and Christ are considered to refer to the same person. However, Jesus is not coreferential with Christ because the writer does not regard Jesus as Christ under the context of (9).

(9) jitsuwa yudayajin-tachi-wa imademo lesu-wa
   actually the.Jews-PL-TOP still Jesus-TOP
   Christ-to mitometei-nai-nodesu.
   Christ-COMP accept-NEG-COP
   ‘Actually, the Jews still do not accept that Jesus is Christ.’

(BCCWJ)

3.3.2. Complex clause

Complex clauses are split into individual clauses in accordance with predicates. The complex clause (10), for example, is segmented into three clauses because it includes three predicates: kumu ‘pull up’, hayaokisuru ‘get up early’, and iu ‘say’. In order to illustrate the relationship between the complex clauses and the identifications of referents, let us consider the process of measurement in RD. More specifically, let us focus on zen-iemoto ‘the former head of school’ in (10). In the first step, you need to check whether there is an antecedent in the preceding clause. Consequently, ojichan ‘grandfather’ is found to be the antecedent because it is coreferential with zen-iemoto. In the second step, you need to measure the distance between the target entity zen-iemoto and its antecedent ojichan. In the present study, RD of an entity is determined by the linear order of arguments. Conforming to this criterion, although iwareda is adjacent to zen-iemoto, since its subject shin-iemoto ‘new head of school’ precedes other arguments, the clause boundaries between zen-iemoto and shin-iemoto is 3. According to this criterion, the RD of zen-iemoto is assigned 2. It should be noted that the existence of the zero subject should be taken into consideration because it intervenes between zen-iemoto and ojichan.

(10) [3 shin-iemoto-wa musuko-kara
      new.head.of.school-TOP son-from
      kuma-re-nai-you ni [1 (S) hayaoki-shina-kutya]-to
      pull.up-PASS-NEG-so.as.to (he) get.up.early-do-must-COMP
      iwa-re-ta sooda],
      tell-PASS-PAST seem Zeniemoto-no
      sekkyokusxo-o mago-ga
      positive-ness-ACC former-head.of.school-GEN
      positiveness-ACC grandson-NOM
      monogatatte-te, . . .
      give.evidence-and
   ‘I heard that the new head of school was told by his son to get up early and pull up water from the well so as not to be preceded by his father. The grandson gave evidence of the former head of school’s positive attitude...’

(Imamura, 2014:228)
3.3.3. Adjacent predicates

One problem in counting clause boundaries arises when two predicates are adjacent to each other. The V₁-te-V₂ form is mentioned as a typical example of adjacent predicates. The V₁-te-V₂ form is normally regarded as belonging to the same clause, but when V₁ and V₂ have different subjects, each verb is categorized into an independent clause (Shimojo, 2005:57–8). In (11a), for instance, the V₁ kat ‘buy’ obligatorily shares the zero subject ‘I’ with V₂ ki ‘come’. In this case, the linked verb kat-te-ki ‘buy-TE-TE-come’ as a whole constitutes one clause. On the other hand, V₁ motte ‘have’ has a nexus with tomodachi ‘friend’ and V₂ karite ‘borrow’ forms a nexus with the zero subject ‘I’. In this case, each verb composes a different clause because they have different subjects.

(11) a. kyanberu-no sūukan kat-te-ki-te
   Campbell-LK soup.can buy-TE-come-and
   ‘(I) bought a Campbell soup can (and came).’

   b. dorai-no-yatsu-o tomodachi-ga motte-te (S) (O) karite
   dry-LK-one-ACC friends-NOM have-TE (I) (it) borrow-and
   ‘A friend had dry (basil) and (I) borrowed (it).’

   (Shimojo, 2005:57–8)

3.3.4. Back-channel feedback

The so-called back-channel feedback such as sō ‘indeed’ and un ‘yeah’ do not constitute independent clauses because they ‘are in general propositionally empty and are usually given by the hearer during the speakers’ conversation turn’ (Shimojo, 2005:58). In (12), for example, uwa ‘wow’ belongs to the following clause kondo-wa Saeko-ga miosukumete ‘This time, Saeko shrank back and...’

(12) uwa, kondo-wa Saeko-ga miosukumete
   wow this.time-TOP Saeko-NOM shrink back-and
   Ryōsuke-ni shigamitsuku
   Ryōsuke-DAT cling.to
   ‘Shouting “Wow”, Saeko shrank back and clung to Ryōsuke this time.’

   (BCCWJ)

3.3.5. Copula

In the present study, copula expressions such as da and dearu are classified as predicates. It should be pointed out that a predicate forms an independent clause. Since copula expressions are predicates, they head independent clauses. In (13), for example, the copula dearu identifies an independent clause because clause boundaries are based on predicates.

(13) waga-kuni-wa kokudo-no sanbun-no-ni-o shinrin-ga
   our.country-TOP land-GEN thirds-of-two-ACC forest-NOM
   simeru-hodo shinrinshigen-ni megumareta-kuni-deari...
   account.for-about forest.resources-DAT be.blessed country-COP
   ‘Our country is a country that is blessed with forest resources in such an extent that two-thirds of the land is covered with forests...’

   (Imamura, 2015:10)

3.3.6. Proposition

The traditional means for calculating RD and TP have been developed in order to investigate the discourse status of an entity (Givón 1983, 1988, 1994). It should be noted that the traditional analyses of RD and TP do not take propositions into consideration. This is because a proposition expresses a relationship between entities, not an entity itself. In order to deal with propositions, some criteria are needed. In this study, the discourse status of propositions is evaluated by calculating the RDs and TPs of the related referents, instead of directly measuring the RD and TP of a proposition. In my approach, the RD of the proposition is substituted for the lowest value of the referents pertinent to that proposition. Suppose that a proposition includes two referents. If the RD value of one referent is 1 and that of the other one is 15, the RD value of the proposition is replaced by 1. Let us consider the process of calculating the RD value for the proposition in (14b). In (14b),
the direct object expresses the proposition Hänsel-ga naka-ni hai-routosuru-no ‘that Hänsel is trying to come in it’, which embraces two related referents Hänsel and candy house. The first step for assessing the RD of the direct object is to measure the RDs of both Hänsel and candy house. Since both Hänsel and candy house are once mentioned in the immediately preceding sentence, their RD values are 1. It should be noticed that the head of the direct object is nominalizer no, which is not referential and has no antecedent, but it is anchored by Hänsel and candy house. Therefore, the RD of the direct object is replaced by the anchoring expression’s RD and its RD is 1.

(14) a. okashinoie-ga  aru-node
candy.house-NOM  be-because
futari-wa    hidoku  bikkurisuru
two.person-TOP  very  surprise-PRS
‘Since there is a candy house, the two are very surprised.’

b. Hänsel-ga  naka-ni  hai-routosuru-no-o
Hänsel-NOM  inside-LOC  come-try.to.do-NMZ-ACC
Gretel-ga  togameru
Gretel-NOM  blame.for
‘Gretel berates Hänsel for trying to enter.’

(Imamura, 2014:229)

3.4. Results

Table 1 displays the abridged data on RD and TP assembled from BCCWJ, showing the average value and the standard deviation for each condition.

A series of t-tests were performed for the average values of RD and TP. In RD, there was a significant difference between the subject and the object in \( S_{\text{NOMOACC}} \) (\( t(198) = 4.73, p < .01 \)), \( S_{\text{TOPOACC}} \) (\( t(198) = 3.72, p < .01 \)), \( O_{\text{ACCSSNOMV}} \) (\( t(198) = 4.29, p < .01 \)), and \( O_{\text{TOPSNOMV}} \) (\( t(198) = 3.52, p < .01 \)), but not in \( O_{\text{ACCSSTOPV}} \) (\( t(198) = 1.17, p = .24 \)).

Concerning the RD values for the object, \( S_{\text{NOMOACC}} \) demonstrated higher RD than \( S_{\text{TOPOACC}} \) (\( t(198) = 2.28, p < .05 \)), whose RD was higher than \( O_{\text{TOPSNOMV}} \) (\( t(198) = 2.95, p < .01 \)), whose RD was as low as \( O_{\text{ACCSSNOMV}} \) (\( t(198) = 1.82, p = .07 \)) and \( O_{\text{ACCSSTOPV}} \) (\( t(198) = 1.18, p = .24 \)).

As for the RD values in the subject, there was no significant difference between \( O_{\text{ACCSSNOMV}} \) and \( O_{\text{TOPSNOMV}} \) (\( t(198) = 0.91, p = .36 \)). In addition, only \( O_{\text{TOPSNOMV}} \) showed higher RD than \( S_{\text{NOMOACC}} \) (\( t(198) = 2.90, p < .01 \)). Furthermore, \( O_{\text{ACCSSNOMV}} \) had higher RD than \( O_{\text{ACCSSTOPV}} \) (\( t(198) = 2.67, p < .01 \)) and \( S_{\text{TOPOACC}} \) (\( t(198) = 3.27, p < .01 \)). However, there was no significant difference in the RD values for the subject between \( S_{\text{NOMOACC}} \) and \( O_{\text{ACCSSTOPV}} \) (\( t(198) = 0.65, p = .52 \)).

<table>
<thead>
<tr>
<th>Sentence types (^a)</th>
<th>Grammatical functions</th>
<th>RD</th>
<th>TP</th>
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<tbody>
<tr>
<td></td>
<td>( M )</td>
<td>( SD )</td>
<td>( M )</td>
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<tr>
<td>( S_{\text{NOMOACC}} )</td>
<td>S</td>
<td>7.62</td>
<td>7.98</td>
</tr>
<tr>
<td></td>
<td>O</td>
<td>13.14</td>
<td>8.53</td>
</tr>
<tr>
<td>( S_{\text{TOPOACC}} )</td>
<td>S</td>
<td>6.31</td>
<td>6.81</td>
</tr>
<tr>
<td></td>
<td>O</td>
<td>10.38</td>
<td>8.58</td>
</tr>
<tr>
<td>( O_{\text{ACCSSNOMV}} )</td>
<td>S</td>
<td>9.86</td>
<td>8.48</td>
</tr>
<tr>
<td></td>
<td>O</td>
<td>5.12</td>
<td>7.09</td>
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<tr>
<td>( O_{\text{TOPSNOMV}} )</td>
<td>S</td>
<td>10.94</td>
<td>8.21</td>
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<td></td>
<td>O</td>
<td>7.01</td>
<td>7.55</td>
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<tr>
<td>( O_{\text{ACCSSTOPV}} )</td>
<td>S</td>
<td>6.94</td>
<td>6.89</td>
</tr>
<tr>
<td></td>
<td>O</td>
<td>5.76</td>
<td>7.39</td>
</tr>
</tbody>
</table>

\(^a\) Each sentence type comprises 100 examples.
In TP, there was a significant difference between the subject and the object in \( S_{\text{NOM}} O_{\text{ACC}} V \) \((t(198) = 3.20, p < .01)\), \( S_{\text{TOP}} O_{\text{ACC}} V \) \((t(198) = 6.33, p < .01, O_{\text{ACC}} S_{\text{NOM}} V \) \((t(198) = 2.58, p < .05), O_{\text{TOP}} S_{\text{NOM}} V \) \((t(198) = 2.43, p < .05), \) and \( O_{\text{ACC}} S_{\text{TOP}} V \) \((t(198) = 3.47, p < .01)\). More specifically, only under the \( O_{\text{TOP}} S_{\text{NOM}} V \) condition did the object have a higher TP than the subject. Under the other conditions, the subject held higher TP than the object.

Regarding the TP values for the object, there was no significant difference between \( O_{\text{TOP}} S_{\text{NOM}} V \) and \( O_{\text{ACC}} S_{\text{TOP}} V \) \((t(198) = 1.07, p = .29)\). Moreover, only \( O_{\text{TOP}} S_{\text{NOM}} V \) was significantly higher in TP than \( O_{\text{ACC}} S_{\text{NOM}} V \) \((t(198) = 2.19, p < .05)\). Furthermore, \( O_{\text{ACC}} S_{\text{TOP}} V \) revealed higher TP than \( S_{\text{TOP}} O_{\text{ACC}} V \) \((t(198) = 2.18, p < .05)\) and \( S_{\text{NOM}} O_{\text{ACC}} V \) \((t(198) = 2.13, p < .05)\). However, \( O_{\text{ACC}} S_{\text{NOM}} V \) were not significantly higher in TP values for the object than \( S_{\text{NOM}} O_{\text{ACC}} V \) \((t(198) = 1.29, p = .20)\) and \( S_{\text{TOP}} O_{\text{ACC}} V \) \((t(198) = 1.31, p = .19)\).

Talking of the TP values for the subject, there was no significant difference between \( S_{\text{TOP}} O_{\text{ACC}} V \) and \( O_{\text{ACC}} S_{\text{TOP}} V \) \((t(198) = 0.09, p = .93)\), between \( O_{\text{ACC}} S_{\text{NOM}} V \) and \( O_{\text{ACC}} S_{\text{TOP}} \) \((t(198) = 1.91, p = .06)\), and between \( S_{\text{NOM}} O_{\text{ACC}} V \) and \( O_{\text{ACC}} S_{\text{NOM}} V \) \((t(198) = 0.70, p = .49)\). \( S_{\text{TOP}} O_{\text{ACC}} V \) demonstrated higher TP in the subject than \( S_{\text{NOM}} O_{\text{ACC}} V \) \((t(198) = 2.74, p < .01)\), whose TP values for the subject were significantly higher than \( O_{\text{TOP}} S_{\text{NOM}} V \) \((t(198) = 2.25, p < .05)\).

4. Discussion

4.1. Basic findings

This section reports the corpus findings concerning the interplay between word orders and particles in terms of information structure, mainly based on the concept of RD and TP. The quantitative analysis outlined above has turned up two important observations. Firstly, this study confirmed that the direct object represents more recently given information in OSV than in SOV, which accords with previous studies (Imamura, 2014, 2015, 2016; Imamura et al., 2014, 2016; Ishii, 2001; Kuno, 1978). There is a tendency that the direct objects are more easily accessible when they are placed in the clause-initial position. Indeed, the anaphoric prominence of the direct object seems to have caused the word order changes from \( S_{\text{NOM}} O_{\text{ACC}} V \) and \( S_{\text{TOP}} O_{\text{ACC}} V \) to \( O_{\text{ACC}} S_{\text{NOM}} V \) and \( O_{\text{TOP}} S_{\text{NOM}} V \); in \( S_{\text{NOM}} O_{\text{ACC}} V \) and \( S_{\text{TOP}} O_{\text{ACC}} V \), the direct objects have higher RDs than the subjects, while in \( O_{\text{ACC}} S_{\text{NOM}} V \) and \( O_{\text{TOP}} S_{\text{NOM}} V \) the direct objects have lower RDs than the subjects. However, in \( O_{\text{ACC}} S_{\text{TOP}} V \), the direct objects are as given as the subjects. It must be noted that the subject is marked by the topic marker \( WA \) in \( O_{\text{ACC}} S_{\text{TOP}} V \), not by the nominative case marker \( GA \), and that both the subject and the object in \( O_{\text{ACC}} S_{\text{TOP}} V \) are as given as the object in \( O_{\text{ACC}} S_{\text{NOM}} V \) and \( O_{\text{TOP}} S_{\text{NOM}} V \). On the basis of these facts, I conclude that both scrambled objects and topic marked subjects are easily accessible referents in \( O_{\text{ACC}} S_{\text{TOP}} V \). This conclusion coincides with previous studies in that \( WA \)-marked referents are more recently given than \( GA \)-marked entities (Hinds and Hinds, 1979; Hinds, 1983; Kuno, 1973b; Shimojo, 2005). To summarize the above discussions in terms of anaphoric prominence, it has been revealed that not only direct objects in OSV but also \( WA \)-marked subjects tend to be given information.

Secondly, the referents of the subjects are more likely to be carried over to the succeeding discourse than those of the direct objects in \( S_{\text{NOM}} O_{\text{ACC}} V \), \( S_{\text{TOP}} O_{\text{ACC}} V \), \( O_{\text{ACC}} S_{\text{NOM}} V \), and \( O_{\text{ACC}} S_{\text{TOP}} V \); the subjects have higher TP than the objects in general. This result signifies that scrambling does not exert a strong influence on the direct objects in terms of cataphoric prominence. In contrast, in \( O_{\text{TOP}} S_{\text{NOM}} V \), the referents of the direct objects tend to be taken over to the succeeding contexts more often than those of the subjects. This is because \( WA \)-marked referents generally have high TP and are more likely to be carried over to the following discourse than case marked referents (Shimojo, 2005). Taken together, cataphoric prominence is more strongly affected by particles and grammatical functions than by word orders, which supports the proposal by Kameyama (1985) and Walker et al. (1994). Since particles are the major determinant of cataphoric prominence, it is logical to think that word order changes work on only anaphoric prominence. In Polish, Siewierska (1993:257) observed the same tendency and argued that TP strongly correlates with subjectivity.

4.2. Scrambling and topicalization

This section is devoted to accounting for the similarities and dissimilarities between scrambling and topicalization in terms of discourse functions, mainly based on the basic findings outlined above. Recall that scrambled objects have low RD and low TP whereas topicalization includes the objects, the RD of which is low but TP is high. This difference can be explained by the interplay between OSV and particles. In OSV, the direct objects are liable to be given information, showing low RD. In terms of particles, \( WA \)-marked referents are more likely to be carried over to the succeeding sentences than \( GA \)-marked or \( O \)-marked referents, showing high TP. Moreover, \( GA \)-marked referents are more likely to be made mention of repeatedly after they appear than \( O \)-marked referents. Taken together, in \( O_{\text{ACC}} S_{\text{NOM/TOP}} V \), the direct object tends to have its antecedent in the preceding discourse due to its low RD, but the subject is more likely to be taken over to the following discourse because of its high TP. This tendency can be generalized by supposing that scrambling is
usually chosen when the direct object is anaphorically prominent but cataphorically non-prominent. In consequence, the succeeding sentences tend to have a link with the referent of the non-scrambled subject. Let us look at an actual example from BCCWJ so as to exemplify the discourse function of scrambling (O_{TOP}S_{NOM}V). In (15b), the scrambled object *sono hanbai ‘that sale’ is accompanied by a demonstrative *sono ‘that’, whose antecedent is *network kiki ‘network device’. Consequently, the head of the scrambled object *hanbai is anchored by the demonstrative *sono. It should be noticed that *sono is the only link with the preceding sentence (15a). This signifies that the scrambled object is anaphorically prominent in (15b). However, the referent of the scrambled object disappears from discourse after (15b). In the following discourse, the referent of the subject *Cisco has been referred to several times after it first appeared. This clearly shows that the scrambled object is cataphorically non-prominent and the subject is cataphorically focussed in the O_{TOP}S_{NOM}V sentence (15b).

(15) a. sōnaruto, network-kiki-ga hituŷōi-ni-naru. if that is the case network-device-NOM necessary-become ‘If that is the case, network devices become necessary.’
   b. sono-hanbai-o Cisco-ga uke, that-sale-ACC Cisco-NOM handle
   c. rieki-o ageru-toyū profit-ACC make-APP
   d. eigyōsenryaku-dearu business.strategy-COP ‘Cisco’s business strategy is to handle those sales, and by doing so they make a profit.’
   e. yueni Cisco-wa tsuneni saisentan-no therefore Cisco-TOP constantly cutting.edge-GEN business-model-o hyōbōdekiru-yō business-model-ACC advocate-in.order.to
   f. mizukara henka-o tsuzuketekita by.themselves change-ACC continue ‘Therefore, Cisco continues to change from the inside, in order to constantly adapt to cutting-edge business models.’

(BCCWJ)

In contrast, when O_{TOP}S_{NOM}V is selected, the speaker/writer continues to talk about the referent of the object in the succeeding discourse. This tendency can be accounted for by the function of WA-marked objects. They convey the intention that the object will stay on as the center in the following discourse. Let us have a look at O_{TOP}S_{NOM}V shown in (16c). The WA-marked object *taishikan ‘embassy’ in (16c) has its antecedent *beikoku taishikan ‘American Embassy’ in the preceding sentence (16a) and has been referenced several times in the succeeding sentences. It should be noticed that *taishikan-in ‘Embassy staff’ in (16e) is bridged with *taishikan in (16c) because *taishikan-in is a part of *beikoku taishikan. Taking the bridging relationship into consideration, the referent of the WA-marked object, *taishikan, remains the center of the attention through the discourse. As exemplified in (16), O_{TOP}S_{NOM}V is selected when the speaker/writer continues talking about the same entity that he or she was talking about before.

   b. beikoku-wa senkyūhyakukyūjūnen no wangan-kiki-igo America-TOP 1990-GEN Gulf-war-after Iraq-to gaiōkankei-o danzetsushiteori, Iraq-with diplomatic.relations-ACC broke.off ‘After the Gulf War in 1990, America broke off diplomatic relations with Iraq, and’
   c. taishikan-wa Poland-ga riyūshitei-ta embassy-TOP Poland-NOM use-PAST ‘Poland used the embassy.’
To summarize the discourse properties of scrambling and topicalization, O_{ACC}SV is chosen when the scrambled object is anaphorically prominent but cataphorically non-prominent whereas O_{TOP}SV anticipates ‘continuing topic’ as the referent of the object. The speaker/writer employs O_{ACC}SV when he or she intends to signal that he or she will be talking about the entity realized as the subject because the scrambled object is cataphorically non-prominent. By contrast, when O_{TOP}SV is chosen, the speaker/writer intends the hearer's attention to be directed toward the same referent, which is realized as the object in O_{TOP}SV.

4.3. General property of word order changes

This section provides a uniform analysis of word order changes in terms of information structure, by taking scrambling and topicalization into consideration. With respect to the TP values of the direct objects, O_{ACC}SV is contrastive to O_{TOP}SV in that the former has low TP while the latter has high TP. With respect to the RD values of the direct objects, however, scrambling has some affinities with topicalization. More specifically, both scrambling and topicalization are applied to referents with intermediate RD values. Based on this fact, I propose that word order changes in Japanese are used for interchangeably accessible referents, which are discourse-old information but not activated enough to be dropped. Shimojo's study provides empirical support for my hypothesis because postposed referents usually have intermediate RD and low TP (Shimojo, 2005:127). The question, however, arises as to why word order permutations prefer interchangeably accessible information. In order to disentangle this issue, we can use the following reductio ad absurdum argument. With regard to highly accessible arguments, it is well-known that they tend to be realized as zero pronouns in Japanese (Hinds, 1983; Hinds and Hinds, 1979; Kameyama, 1985; Kuno, 1978; Martin, 1975; Walker et al., 1994). It must be pointed out that discourse contexts are indispensable for the appropriate interpretation of a zero pronoun. One reason for this is that ‘Japanese has no marking on the verb to provide any clues to the identity of’ a zero pronoun (Hinds, 1983:50). In addition, Hinds (1978, 1982) argues that zero pronouns are the most unmarked form of topic continuity. To be more concrete, a zero pronoun is normally selected when the speaker would like to continue talking about the same referent. Furthermore, Hinds (1983) found in spoken Japanese that zero pronouns usually have their antecedent in the most recent sentence, meaning that the average RD value of zero pronouns is only 1. Moreover, word order changes cannot be applied to phonetically null constituents. Taken together, word order changes are incompatible with highly accessible referents, which are most commonly realized as zero pronouns in Japanese.

With regard to inaccessible arguments realized as the direct object, there is no motivation to select word order changes because in situ position itself is a preferable position for new information. Kuno (1978:60) asserts that new information preferably appears in the position directly preceding the verb. In SOV, if the direct object is new information, it is already located in the informationally ideal position. Therefore, there is no need to move the new information realized as the direct object in SOV.

With regard to inaccessible arguments realized as the subject, the choice of post-nominal particles works. Note that the nominative case marker GA correlates with new information (Chafe, 1970, 1976; Hinds, 1983, 1984; Hinds and Hinds, 1979; Matsushita, 1930; Mikami, 1963; Ono, 1973; Shimojo, 2005). When the subject is new information, GA-marking can be utilized instead of word order changes. It should be noted that S_{NOM}OV is the canonical word order and thus syntactically more unmarked than other word orders in Japanese (Koizumi and Tamaoka, 2010; Miyagawa, 2001; Saito, 2003; Saito and Hoji, 1983). Syntactically, it is plausible that GA-marking is more preferable to word order changes in order to mark new information.

The discussion above brings us nicely to the conclusion that word order permutations in Japanese are inconsistent with both highly accessible and inaccessible information. Therefore, it is reasonable to conclude that word order changes are applicable only to interchangeably accessible information, which is discourse-old information but not activated enough to be omitted. This may be the reason why scrambling, topicalization, and postponing have intermediate RD values.
Yet, intermediately accessible information is not necessarily expressed via word order changes. It can be realized by making use of the topic marker WA, which tends to mark intermediately accessible information (Hinds, 1983; Hinds and Hinds, 1979; Shimojo, 2005, 2006). However, when WA is used for objects, it invites a marked contrastive meaning unlike WA-marked subjects (Kuno, 1973a; McGloin, 1990; Takami and Kuno, 2006). If context does not call for such marked contrastiveness, scrambling the object is the option chosen.

On the other hand, when the subject is intermediately accessible information, the choice between the WA-marking in SOV (STOPOV) and postposing of the subject (OVS) seems to be determined by the cataphoric prominence of the subject. It should be noted that the subject shows higher TP values in the in situ position than in the postposed position (Shimojo, 2005, 2006).

5. Conclusion

This study has inquired into the interactions between word order changes and particles in terms of discourse functions using a quantitative approach. The findings from the quantitative analyses delineate the functional properties of scrambling and topicalization. First of all, the current corpus study confirmed that the direct objects in OSV and WA-marked entities are generally given information. Yet, word order changes from SOV to OSV do not influence the cataphoric prominence of a referent. Being unaffected by word order, cataphoric prominence depends largely on particles; WA-marked referents are more likely to be carried over to the succeeding sentences than GA-marked referents, which are in turn referred to in the following sentences more frequently than O-marked referents. This result supports the view that Cf-ranking is not based on word orders but on grammatical functions plus grammatical or zero topic marking (Kameyama, 1985; Walker et al., 1994). Based on the results of the present corpus analysis, the pragmatic aspects of scrambling and topicalization can be accounted for in the following ways. With regard to $O_{ACC}S_{NOMTOPV}$, direct objects are usually given information because there is a correlation between the direct objects and anaphoric prominence in OSV. Furthermore, the subjects tend to be taken over to the succeeding discourse than the direct objects because GA-marked or WA-marked entities are cataphorically more prominent than O-marked ones. With regard to $O_{TOPS}_{NOMV}$, the direct objects are generally given information because $O_{TOPS}_{NOMV}$ is an OSV word order. Moreover, WA-marked objects are more likely to be referred to again in the succeeding sentences than the GA-marked subjects because WA-marked constituents are cataphorically more prominent than GA-marked constituents. It therefore seems reasonable to conclude that scrambling is pertinent to anaphorically prominent but cataphorically non-prominent objects and that topicalization is especially germane to ‘continuing topic’ as the referent of the object.

Next, it has been revealed that there is a common property shared by scrambling and topicalization. They are both applied to intermediately accessible information. Based on this fact, I propose that word order changes in Japanese occur most frequently in conjunction with intermediately accessible entities. This proposal agrees with Shimojo (2005, 2006)’s findings in the sense that postposed elements are also intermediately accessible entities. Given this, an interesting question arises as to whether there is a correlation between word order changes and intermediately accessible information in other pro-drop languages. If this correlation is a universal phenomenon among languages which permit zero pronouns, we will find it in other pro-drop languages. In contrast, if it is a language-specific preference for Japanese, we will not observe it in other pro-drop languages. This issue must be explored in further studies.

Although this article has concentrated on givenness, there may be other factors that influence word order permutations. To put it another way, a limitation of this study is that it does not take into consideration factors other than anaphoric and cataphoric prominence. Furthermore, the present corpus analysis does not deal with other particles such as the highlighting particle MO, which may interact with word order changes in different ways. The scope of this study is thus very restricted. Yet, it has been at least demonstrated that information structure has an influence on word order permutations in Japanese. It is reasonable to assume that a fruitful avenue of future research would be to scrutinize the interactions between word orders and other kinds of particles.

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Acknowledgement

I am grateful to every person who supported my research. In particular, I wish to express my gratitude to Prof. Bjarke Frelesevig, Dr. Stephen Wright Horn, Dr. Kerri L. Russell, Dr. Tohru Seraku, Dr. Einar Andreas Helgason, and Dr. Laurence Mann. Without their help, I would not have completed this article.

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6 Most highlighting particles are called fuku joshi ‘adverbial particle’ in traditional grammar. These particles foreground one part of a proposition described in a sentence (Iwasaki, 2002:44). This category also includes the contrastive usage of WA.


