

# Processing of English Sentences Consisting of Frequency Adverbs by Japanese EFL Learners

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**Abstract**—Previous studies suggest that, adverbs can have comparatively free positioning to that of other parts of speech in English language. This study focused on frequency adverbs which represent number of occurrences of an action or a condition. Since different positioning may produce relatively different meaning (or focus) of given sentences, processing of such sentences is assumed to be complex especially for L2 learners. Therefore, this study investigated how L2 learners process English sentences consisting of adverbs in different positions. The main goal of this study is to reveal which information-structure is mostly identified among Japanese EFL learners. A sentence-correctness-decision task was conducted with a group of 30 students. Stimuli were selected via a free-production written task. The data were analyzed using SPSS statistics with repeated measures (i.e., ANOVAs). A simple comparison between alternative ordering showed that, the sentences consisting of adverbs in between-positioning were processed faster to that of initial-positioning, assumable due to the different information flow. Thus, according to this study, English sentences consisting of frequency adverbs with the between-positioning [S (A (VO))] is likely to possess a high acceptability among Japanese EFL learners to that of initial-positioning sentences [A (S (VO))].

**Index Terms**—English frequency adverbs, Japanese EFL students, initial-positioning, between-positioning, information structure

## I. INTRODUCTION

Generally, English language disallows flexibility in word order (Karimi, 2003). Though, some previous studies suggest that adverbs, among other parts of speech, illustrate relatively different positioning, however, not exclusively free (Dehham, 2014; Ogura et al., 1997; White, 1991 among others). This flexibility of positioning is expected producing potential process-ability problems especially for second language learners (i.e., EFL learners). Thus, the main purpose of this research is set to reveal Japanese EFL learners' processing mechanism of English sentences consisting of adverbs where word order is said to be comparatively inconsistent. In addition, a secondary goal is set to seek if there is any identical tendency in processing between L1 & L2, since L1's involvement cannot totally be mitigated especially in acquisition and also in processing (Pienemann, 1998). L2 learners are experiencing difficulties in adverb acquisition and mastering notably from two aspects; flexible positioning and intervention of L1. Previous studies (Dehham, 2014; White, 1991), have surveyed EFL and ESL students' usage of English sentences consisting of adverb expressions utilizing questionnaires and grammaticality judgment tasks. Although such tasks provide information whether learners have properly acquired expressions consisting of adverbs, evidence on processing mechanism cannot be acquired directly due to methodological issues. Thus, this study aims to contribute evidence on processing mechanism from a psycholinguistic view. In particular, this study focuses on the processing mechanism of Japanese EFL learners.

In the followings, section 2 will provide in-depth information on the main concepts of this study. This section will deliver information on the word orders of Japanese and English languages with relation to sentences consisting of adverbs. Next, the third section, methodology, will provide experiments' details on data gathering, analysis and findings etcetera. Finally, the last section, conclusion, will provide an overall summary of the study.

## II. CLASSIFICATION AND WORD ORDER OF ADVERBS IN L1 (JAPANESE LANGUAGE) AND L2 (ENGLISH LANGUAGE)

This research intends to reveal the mostly identified word order for English sentences consisting of adverbs. First, it is important to grasp a basic idea on adverb classification and positioning in English language and Japanese language. Thus, next part will provide information on classification and positioning of both English and Japanese in this regard, and look in to the information of sentence structures consisting of frequency adverbs.

### A. Classification and Positioning of English Adverbs

There are two main important facets about English adverbs. First, adverbs classification indicates a complicated pattern in its nature. Second, adverb placement in English language is relatively free due to its multiple functioning (Cambridge dictionary, (2017); Ogura et al., 1997; White, 1991). According to Cambridge dictionary, (2017), adverbs can modify nouns, verbs, adjectives, other adverbs, noun phrases, clauses, and sentences. Following, a study conducted by Ogura et al., (1997) reports that, adverbs can be classified into 41 different classes according to grammatical functions, meaning, and their default positioning. For example, according to grammatical functions, adverbs can be

utilized as adjuncts, subjuncts etc. while meaning may illustrate a process, time, space etc. The default positioning is said to be initial, medial, end, pre & post. Furthermore, White, (1991), similarly reports that, despite semantic and syntactic restrictions, English adverbs still demonstrate relatively free positioning. For example, although English adverbs do not appear between the verb and its direct object (SVAO<sup>1</sup>), they may occur at the end of the verb phrase (VP) as in 'Kanda writes his paper slowly (SVOA)', pre-subject position as in 'slowly he got sick (ASVO)', between the subject and the verb as in 'Kanda often reads books (SAVO)' etcetera. Accordingly, these studies are evidential that, English adverbs demonstrate a complex condition. As a result, it has produced many difficulties for L2 learners during acquisition. For instance, in a study conducted by Dehham, (2014), Iraqi EFL college students have illustrated difficulty in acquiring adverbs due to the complexity in syntax and semantic structures. Results of this study suggest that, frequency adverbs tend to produce higher difficulties for Iraqi EFL students. Following, White, (1997), also reports that, alternative positioning causes potential learnability problems in acquiring English adverbs for EFL students (which also includes a parametric difference between L1 (French) and L2 (English) as another cause). The present study set a secondary goal to seek if there is any similar tendency on L1 & L2 processing. Thus, a brief explanation of Japanese sentences consisting adverbs is provided in the next section.

### B. Classification and Positioning of Japanese Adverbs

The nature of classification and positioning of Japanese adverbs are identical to that of English adverbs, in which they also demonstrate a diverse classification and relatively free in word order positioning (Koizumi and Tamaoka, 2006; Namba and Tamaoka, 2014). Koizumi and Tamaoka, (2006), has investigated the canonical positions for four kinds of adverbial expressions (i.e., modal, time, manner, and resultative) via a sentence plausibility judgment task. This study provides evidence that, sentences consisting of modal adverbs resulted a possible ASOV order while time adverbs resulted with two possibilities; ASOV and SAOV as illustrated in 1a & 1b. However, manner and resultative adverbs have demonstrated SAOV and SOAV orders in the same regards. According to this study, the canonical order for Japanese time adverbs remains ambiguous and requires a further inquiry in order to reveal which order is mostly accepted. However, it provides a starting point for the present research with significant evidence.

1. a. しばしば サラは 映画を みる  
 shiabshiba sara-wa eiga-wo miru  
 Often (Adv) Sarah (Sub, anim) movie (Obj, inam) watch (V, PRE)  
 Sarah often watch movies.
- b. サラは しばしば 映画を みる  
 sara-wa shiabshiba eiga-wo miru  
 Sarah (Sub, anim) Often (Adv) movie (Obj, inam) watch (V, PRE)  
 Sarah often watch movies.

### C. Alternative Ordering and Disconnection of Information Cues

The study conducted by White, (1991), has experimented focusing on two kinds of English adverbs; frequency (i.e., time) and manner. According to this study, the order of these two types illustrates a variety of positions in a sentence as ASVO, SAVO, SVOA, but not SVAO. On the other hand, the study conducted by Koizumi and Tamaoka, (2006), reports that, Japanese sentences consisting of time adverbs can have a higher acceptancy in either ASOV or SAOV as possible word orders. Thus, despite the conventional canonical word orders of English and Japanese languages which are different, this study assumes that, frequency adverbs demonstrate identical movements in positioning manner [as in (A(S(VO))) and (S(A(VO))) orders in English, and (A(S(OV))) and (S(A(OV))) in Japanese]. It is said that, L1 interferences can't totally be mitigated during acquisition either in ESL or EFL situations (Brown, 1998; Pienemann, 1998). Similarly, L1 can intervene L2 processing as extended similarities or over generalizations. For instance, the processability theory (proposed by Pienemann, 1998), provides information on L1 role during L2 processing stating, despite L1 transfer is severely constrained by the hierarchical procedures, still L1 features and structures will be transferred if the procedures appear to emerge in some corresponding points, which in turn suggest a probability of L1's interferences in L2 processing. Accordingly, this study assumes that, the typological aspects between Japanese and English may lead the learners to promptly identify one of the alternative orders.

The alternative positioning of both languages raises an interesting point of sentence's information flow. First, English language is generally known to possess a Subject-Verb-Object canonical order while Japanese language possesses a Subject-Object-Verb canonical order (Hopp, 2005; Iwasaki, 2003). It is identical that both languages format sentence structure with subject noun (either an animate / inanimate) proceeding a predicate [Verb (action), Object (goal/instrument)] / Object (goal/instrument), Verb (action)]. This produces a chain of information in a manner where an actor is mainly focused, and a secondary attention is given to the predicate phrase (either action + goal/ instrument, or goal/ instrument + action respectively). The canonical SVO and SOV in both languages are widely accepted by many native and non-native speakers due to this information flow. Since adverbs positioning is said to be unrestricted in

<sup>1</sup> The abbreviation stands for Subject-Verb-Adverb-Object.

accordance with previous studies (Cambridge Dictionary, 2017; Ogura et al., 1997; Urano, 2012; White, 1991), this study assumes that, this chain of information breaks its structure when an adverb is placed with extra information in either word order as in [English (Actor, Time (Action + Goal/Instrument)) / Japanese (Actor, Time (Goal/Instrument + Action))], or [English (Time, Actor (Action + Goal/Instrument)) / Japanese (Time, Actor (Goal/Instrument + Action))]. This extra load of information may trigger for a longer processing time in comprehension. The question is, which structure is heaviest for processing? As aforementioned, this study assumes that both languages are identical in adverb positioning manner as in [A (S(VO))] & [A (S(OV))] where an adverb is placed in the initial position of the sentence (hereafter, initial-positioning), and in [S (A (VO))] & [S (A (OV))] where an adverb is placed between the subject and the predicate (hereafter, between-positioning). Based on this assumption, there is a high possibility that, processing between L1 & L2 maybe identical. Needless to mention, the structural complexity and information flow of both word orders have their different points in favor. Thus, this study conducted an experiment to discover which structure will uphold by the Japanese EFL learners. The details are explained in the methodology section.

### III. METHODOLOGY

The main purpose of this survey is to discover which information-structure (initial-positioning / between-positioning) is mostly identified by Japanese EFL learners during processing. Two experiments (EX#1 & EX#2) were conducted to gather data. First, EX#1 is conducted focusing on English frequency adverbs. This will provide evidence on which structure that Japanese EFL learners process faster. Second, EX#2 is conducted focusing on Japanese frequency adverbs as referential with the expectations of seeking evidence on any relativity. The details are explained below.

#### A. EX#1 Processing of English Sentences Consisting of Frequency Adverbs

Since alternative positions are consisted with different information flow, EX#1 is limitedly focused on the processing of two different word order patterns. The results of this experiment will provide the answers to the main research question of this survey. The details are explained followingly.

##### 1. Materials

Adverbs applied for the main examination were selected via a free-production written task conducted by 10 Japanese language native speakers who are university students. Participants were instructed to produce 5 sentences consisting of frequency adverbs. However, no instructions were provided on which adverbs they should use. A total of 50 sentences consisting of frequency adverbs were collected as a result. Four adverbs were selected based on higher frequency; definite frequency adverbs [always (26%) and every day (18%)], indefinite frequency adverbs [usually (12%) and normally (8)], others (36)], which three were identical with the study conducted by White, (1991). A total of 32 stimuli were built for EX#1. Stimuli for correct 'Yes' responses and correct 'No' responses were built in order to avoid side effects of repetition. Only the responses for correct 'Yes' stimuli were taken into main analysis. This study employed the word orders SAVO and ASVO as proposed by White, (1991). For example, the SAVO order for selected four frequency adverbs are presented as [Tom always reads books, Sarah everyday eats pizza, Neel usually drinks coffee, Michel normally wears jeans]. As a result, two word order patterns were built for each adverb; for SAVO as Tom (Sub, anim) always (Adv) comes (V+PRE) home (Obj, inam), for ASVO as always (Adv) Tom (Sub, anim) comes (V+PRE) home (Obj, inam). Thus, a total of 8 sentences were prepared for actual testing. Then, another 8 sentences were prepared as dummy sentences which were not included in the main analysis. Additionally, another 16 sentences were used to prepare correct 'No' responses stimuli in the same manner. As a result, the experiment was prepared consisting of 32 stimuli. A counter-balanced designed is applied to avoid repetition of the stimuli.

##### 2. Participants

A group of thirty EFL learners (Japanese language native speakers) took part in the present experiment (19females & 11males). The ages were ranged from 17 years 2 months to 20 years 6 months with an average age been 18 years 6 months on the day of testing. The English proficiency level was equivalent to points 45 - 60 of TOEFL IBT scores.

##### 3. Method of Survey

The experiment was conducted on a laptop computer using DMDX program (version 5.1.0.0). All the participants were given a practice trial before the actual experiment with different stimuli. The stimuli were randomly presented as a wave sound file for 600 milliseconds after the appearance of red marked 'LISTEN' which indicated attention prior to the stimuli presentation. Participants were instructed to respond either 'Yes' or 'No' by pressing either left shift key for correct 'Yes' answers or right shift key for correct 'No' answers as quickly and as accurately as possible to determine whether the sentence shown on the screen is 'acceptable' or not, meaning whether presented stimuli are at use or not. The reaction times (RTs) and error rates (ERs) are illustrated in table 1. Only correct 'yes' responses will be taken into considerations for discussion.

##### 4. Results

Table 1 depicts overall results for processing English sentences consisting of adverb expressions in two different word orders. The table illustrates the differences on reaction times and error rates respectively.

**Table1. Reaction times and error rates for English sentences consisting of adverbs**

Response Type	Adverb position	Sentence Type	Reaction times (ms)		Error rates (%)	
			M	SD	M	SD
'Yes'	<i>Initial</i>	A-S-V-O	4008	1103	34.17%	33.14%
Responses	<i>Between</i>	S-A-V-O	3248	1693	28.33%	30.61%
	<i>Difference on reaction times</i>		<b>761</b>			
'No'	<i>Initial</i>	A-S-V-O	3732	1569	27.50%	31.72%
Responses	<i>Between</i>	S-A-V-O	3548	1593	48.33%	32.12%

Note : M stands for mean. SD stands for standard deviation.

The results suggest that, for correct 'yes' responses, SAVO ordered sentences were processed faster in participant analysis [ $F(1,29)=7.588, p<.01$ ] and item analysis [ $F(1, 3)=12.653, p<.05$ ], while correct 'no' responses illustrated no significance in the same regard [ $F(1,29)=0.27, n.s$ ] and [ $F(1,3)=9.289, p<n.s$ ]. However, the error rates depicted the reverse in error rates, where correct 'yes' responses illustrated no significance both in participant analysis [ $F(1,29)=0.582, p<n.s$ ] and item analysis [ $F(1,3)=1.000, p<n.s$ ] while correct 'no' responses has resulted with significant difference between ASVO order and SAVO order [ $F(1,29)=10.042, p<.01$ ] and [ $F(1,3)=30.857, p<.05$ ].

#### B. EX#2 Processing of Japanese Sentences Consisting of Frequency Adverbs

An additional experiment is conducted to seek information if the processing illustrates any congruence between L1 & L2. The details are explained below.

##### 1. Materials

A total of 32 stimuli were built for EX#2. Japanese stimuli were created based on English adverbs; Always いつも (itsumo), everyday まいにち (mainichi), usually たいてい (taitei), normally つうじょう (tsuujou). This study applied the word orders ASOV and SAOV as presumed by Koizumi & Tamaoka, (2006). First, a sentence consisting of an adverb with a transitive verb was built according to ASOV order as いつも太郎は家へ帰る itsumo (Adv) tarou-ha (Sub, anim) uchi-he (Obj, inam) kaeru (V+DIF) meaning 'Taro always comes home'. Then, SAOV order is derived based on above ASOV sentence as tarou-ha (Sub, anim) itsumo (Adv) uchi-he (Obj, inam) kaeru (V+DIF<sup>2</sup>). As a result, 8 stimuli were built for correct 'Yes' responses. Another, 8 stimuli were built for the correct 'No' responses. Then, another 16 stimuli were created as dummy sentences. As a result, a total of 32 sentences were prepared for the examination of Japanese adverb word order. It should be noted that, since the Japanese stimuli are based on English stimuli, the number of words and phrases remain identical. A counter-balanced design was applied as list 1 and list 2, in order to avoid effects of repetition. Reaction times and error rates were recorded simultaneously.

##### 2. Participants & method

Refer to EX#1 information.

##### 3. Results

Table 2 summarizes the results for processing Japanese sentences consisting of adverb expressions. The reaction times and error rates are displayed respectively.

**Table2. Reaction times and error rates for Japanese sentences consisting of adverbs**

Response Type	Adverb position	Sentence Type	Reaction times (ms)		Error rates (%)	
			M	SD	M	SD
'Yes'	<i>Initial</i>	A-S-O-V	4179	1260	20.83%	26.33%
Responses	<i>Between</i>	S-A-O-V	3532	1185	25.00%	25.43%
	<i>Difference on reaction times</i>		<b>647</b>			
'No'	<i>Initial</i>	A-S-O-V	3716	1707	39.17%	38.66%
Responses	<i>Between</i>	S-A-O-V	3302	1889	31.67%	37.10%

Note : M stands for mean. SD stands for standard deviation.

The results for EX#2 conversely suggest that, for correct 'yes' responses, SAOV ordered sentences were processed faster only in participant analysis [ $F(1, 29) = 6.483, p<.05$ ] but not in item analysis [ $F(2, 3) = 6.917, p<n.s$ ] while correct 'no' responses has resulted with no significance in the same regard [ $F(1, 29) = 0.749, p<n.s$ ] and [ $F(2, 3) = 3.193, p<n.s$ ]. Error rates on the other hand, depicted no significant difference either in correct 'yes' responses [ $F(1,$

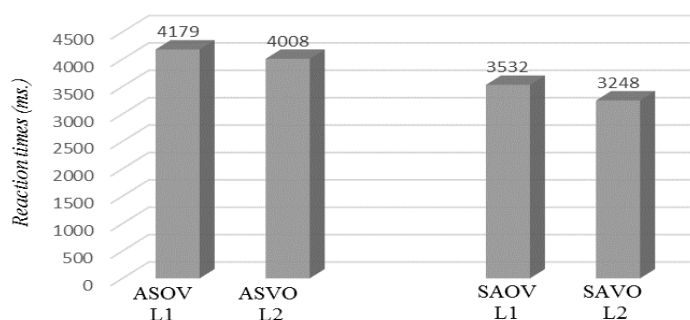
<sup>2</sup> DIF stands for dictionary form.

29) = 1.000,  $p < n.s$ ] and [F2 (1, 3) = 0.122, n.s], or correct 'no' responses [F1 (1, 29) = 0.710,  $p < n.s$ ] and [F2 (1, 3) = 2.400,  $p < n.s$ ].

### C. Discussion

This study examined the acceptability of different word order for the sentences consisting of adverb expressions in English language and Japanese language via two experiments. The primary goal was to seek information on the most acceptable word order for English sentences consisting of frequency adverbs among Japanese EFL learners. Experiment#1 was conducted to gather evidence for this purpose. The results provided evidence that; English sentences consisting of frequency adverbs with the between-positioning [S (A (VO))] were processed faster (with 761ms difference in this case) to that of initial-positioning [A (S (VO))]. A previous study conducted by White, 1991, has suggested that, native speakers prefer sentences where subject noun proceeds the adverb. Results of the present study resembles the idea presented by White, (1991), between-positioning (SAVO) word order illustrated comparatively a high acceptance among Japanese EFL learners. Following, the results of EX#2 for Japanese sentences consisting of adverb expressions resemble the results to that of EX#1, between-positioning sentences (SAOV) have processed faster to that of initial-positioning (ASOV) ordered sentences. However, these results are somewhat contrastive to the data provided by Koizumi and Tamaoka, (2006), which suggested that, the Japanese time adverbs resulted with two possibilities; ASOV and SAVO.

The results of this study also reconfirmed that, for both English and Japanese languages, the conventional canonical word order; S (A) V O for English, and S (A) O V, remains unchanged despite excelled information. As aforementioned in section 2.2, although the alternative positioning provided information in a different flow, participants have reacted faster to the order where an actor proceeds the sentence in both languages; [English (Actor, Time (Action + Goal/Instrument)) and Japanese (Actor, Time (Goal/Instrument + Action))], than to the other where an adverb provides a major focus to the whole sentence as in [English (Time, Actor (Action + Goal/Instrument)) / Japanese (Time, Actor (Goal/Instrument + Action))]. These results also suggest that, human's sentence processing tend to prioritize animate nouns (human in the present case) compared to inanimate nouns (frequency adverb in this case).



**Fig.1 Processing difference between L1 (JAP) & L2 (ENG)**

This study setup a secondary goal as to seek if there is any similar tendency on L1 & L2 processing. Experiment#2 was conducted, first to gather information on L1 sentence processing with the same regards, and then to examine if there is any relationship between the processing mechanism. Figure 1 illustrates a simple comparison between L1 & L2 processing differences pertaining correct 'Yes' responses for both initial-positioning and between-positioning. The reaction times for correct 'Yes' responses in tables 1 & 2 are evidential that, both English and Japanese sentence processing show an identical tendency on having a subject noun proceeding to an adverb and then a predicate followed. A further analysis using ANOVAs was conducted to see if the processing times demonstrate any statistical significance between processing times. The results showed that, for English ASVO and Japanese ASOV word orders, reaction times were insignificant both in participant analysis [F1 (1,29) = 1.184, n.s] and in item analysis [F2 (1,3) = .040, n.s], while for English SAVO and Japanese SAVO word orders, reaction times were insignificant only in participant analysis [F1 (1,29) = .824, n.s] but significant in item analysis [F2 (1,3) = 61.162,  $p > .05$ ]. This suggests that, the Japanese EFL learners of this study illustrate no difference in processing L1 and L2 sentences consisting of frequency adverbs with initial-positioning. As for the reaction times on between-positioning sentences, since participants' analysis showed no significant difference, it is likely that these learners consequently possess similar characteristic in processing mechanism to that of initial- poisoning, though requires a further inquiry with additional stimuli as the item analysis confirmed slight difference. Overall, it is difficult to draw any exact assumptions on the relation between L1 processing and L2 processing mechanism as noted in processability theory (Pienemann, 1998). Moreover, the reaction times between L1 processing and L2 processing of this study illustrated an unprecedented phenomenon, (usually L1 reaction times are faster comparatively to the L2 reaction times). It can be assumed that, the participants required longer to process Japanese sentences consisting of frequency adverbs due to the fact of free word ordering in Japanese language

as also noted in previous studies e.g., Koizumi and Tamaoka, 2006; Namba and Tamaoka, 2014. However, it is necessary to conduct further research on this regards in order to reveal hidden factors.

#### IV. CONCLUSION

This study was conducted with the main purpose of revealing the most identified information-structure for English frequency adverb word order among Japanese EFL learners during processing. An experiment was conducted having 30 Japanese native speakers utilizing a computer-based program. The main analysis was focused on the reaction times of the processing of alternative ordering. Two different word orders were examined; initial-positioning and between-positioning. The results suggested that, Japanese EFL learners process the sentences faster with a Subject-Adverb-Object-Verb order to that of Adverb-Subject-Object-Verb order proving sentences initializing with animate nouns can easily be processed. Thus, according to this study, English sentences consisting of frequency adverbs with the between-positioning [S (A (VO))] is likely to possess a high acceptability among Japanese EFL learners to that of initial-positioning sentences [A (S (VO))].

An additional experiment (EX#2) was also conducted to seek information on any relation between the processing mechanism of L1 & L2. The results of EX#2 also depicted a tendency to that of L2 processing having the between-positioning sentences [S (A (VO))] processed faster to that of initial-positioning sentences [A (S (VO))]. However, a general tendency on the mean times cannot be revealed due to unprecedented data between L1 & L2 processing times.

Although the main question of this research is answered, there were number of limitations in methodological issues. First, the examined number of English frequency adverbs can be pointed out as a major limitation. This study only was focused on four frequency adverbs; definite frequency, (always and every day), indefinite frequency (usually and normally). A further study with a higher number of frequency adverbs including with other types is necessary to generalize the conclusions drawn in this study. Second, this study could not examine participants with different English knowledge due to unavoidable circumstances. Therefore, it may also be important to multiply the number of participants focusing on English language ability as beginner, middle, advanced etcetera. Furthermore, figure 1 is evidential that the participants have taken longer to process L1 sentences to that of L2 sentences. It is generally known that processing of L1 sentences usually take shorter comparatively to the L2 sentences. A primary factor for this phenomenon can be pointed out as the free word order phenomenon in Japanese language. In addition, the order of stimuli presentation can also be considered as another gauge, however, needs further examination.

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