

Development of Grammatical Awareness through English Classes in a Public Elementary School in Japan

Junko Shibuya

Introduction

English education in public elementary schools formally started in 2020 under the national curriculum standards issued in 2017, with 5th and 6th graders taking foreign language classes and 3rd and 4th graders taking foreign language activities. 2018 and 2019 were the transitional period between the old curriculum to the new one. In that period, for 5th graders and 6th graders, the number of classes of foreign language activities increased, from 35 classes to 50 classes per year, and for 3rd and 4th graders, 15 classes of foreign language activities per year were introduced. In that transitional period, the government-created materials were distributed.

Under the new curriculum, children are supposed to develop an awareness of the English language system by using English in communication activities (Ministry of Education, Culture, Sports, Science and Technology, 2018). They listen to a foreign language, and they use it for communication. This means that they are expected to learn grammar through their own foreign language experiences. This policy aligns with the usage-based approach, which claims that people develop language based on language experiences.

Although grammar is the basis of language learning, few studies have been conducted on the grammatical awareness of Japanese students learning English in public elementary schools. English education in an elementary school forms the basis of learners' life-long English learning; thus, it is crucial to measure the grammatical awareness of elementary school students. Moreover, none of the previous studies appropriately applied the usage-based approach to the development of grammatical awareness in English classes in elementary schools in

Japan. Since English has become a regular subject in elementary schools, it is interesting to investigate whether the usage-based approach is the appropriate theory to explain development of grammatical awareness among Japanese young EFL learners.

Usage-based linguists have claimed that frequency is the key to develop language. Focusing on frequency, Allen-Tamai (in press) created a test measuring grammatical awareness of Japanese students learning English in public elementary schools. This test was the first attempt to measure the comprehensive grammatical awareness of elementary school students focusing on frequency. Using this test, the data of 5th and 6th graders in a public elementary school was collected in Ishikawa prefecture.

Literature Review

Usage-Based Approach

The usage-based approach claims that people develop their language through their language experiences (Robinson & Ellis, 2008, p.494)—that is, through their language use. The term “usage-based” was first coined by Langacker (1987) and Tomasello (2005) developed the usage-based approach in the acquisition of children’s first language (L1). In the usage-based theory, constructions are the basic units of grammar (Croft, 2001; Fillmore et al., 1988; Goldberg, 1995, Langacker, 2000). Usage-based linguists claimed that constructions encompass all levels of language unit. Bybee (2008) raised the following linguistic units as examples of constructions:

- 1 simple lexical words: *table, decide, pretty*
- 2 grammatical morphemes and the items they appear with: VERB + Past Tense; the + NOUN.
- 3 Idioms with fixed lexical content: *go great guns*
- 4 Idioms that are partially filled: *jog <someone’s> memory*
- 5 Constructions with some fixed material: *he made his way through the crowd*
- 6 Fully abstract constructions: *they gave him an award.* (Bybee, 2008, p.217)

Since constructions cover all levels of linguistic units, there is a continuum between words to syntax (Bybee, 2008; Croft, 2001; Goldberg, 1995; Langacker, 1987). It means that vocabulary learning and grammar learning are connected.

Many usage-based linguists agree that frequency is crucial in constructional development. There are two types of frequency; token frequency and type frequency. “Token frequency counts the number of times a unit appears in running text” (Bybee, 2008, p.218). Bybee (2008) noted that “any specific unit, such as a particular consonant [s], a syllable [ba], a word *dog* or *the*, a phrase *take a break*, or even a sentence such as *You know what I mean* can have a token frequency” (p.218). A high token frequency item is entrenched, and this item is recognized as a unit or a chunk (Langacker, 1987, p.59). Croft and Cruse (2004) state that “in the usage-based model, token frequency determines degree of entrenchment of a single word” (p.309). They raised the word “lie” as an example of a high token frequency item; if one encounters the word “lie” repeatedly, the word “lie” is entrenched, and comes to be recognized as a unit (p.309). On the other hand, “type frequency is a property of patterns or constructions and refers to the number of distinct items that can occur in the open slot of a construction or the number of items that exemplify a pattern” (Bybee, 2008, p.221). Croft and Cruse (2004) mentioned that “type frequency determines the degree of entrenchment of a schema” (p.309). They raised the morpheme of regular past tense “-ed” as an example of high type frequency item; if a person encounters various items of the regular past tense form attached with “-ed” such as “rapped”, “stored”, “typed”, “pined”, “sated”, and “griped”, he/she creates the schema of “-ed” from these examples (p.309). This enables people to create a variety of regular past tense forms. Bybee (1995) states that “type frequency is a major determinant of productivity” (p.432).

Token frequency and type frequency are related to the development of constructions. Based on token frequency of verbs, children construct item-based schemas; children make “item-based schemas” for high frequency verbs, such as “Throw __”. “__kick __”, “__ running”, “__ give __ __”, “Break__”, and “__ fall down” (Tomasello, 2005, p.120). Tomasello (2005) noted that “in the verb

island hypothesis the schemas are not structurally related” (p.120), thus each item-based schema exists independently. These item-based schemas are also called “verb islands” (Tomasello, 2005); thus, they exist as if they were independently floating islands. On the other hand, type frequency of verbs is concerned with the generalization of the item-based schemas or verb islands. Kodama and Nozawa (2009) suggested that by encountering high type frequency of verbs in a similar construction, children generalize them and form a “constructional island” (pp.84-85). For example, by encountering similar verb islands such as “__ give __”, “__ throw __”, and “__ kick __”, children generalize them and form a constructional island such as “SVOO” (Kodama and Nozawa, 2009, p.85). Kodama and Nozawa (2009) state that children generalize verb islands based on these similarities and form constructional islands (p.85). This shows how children develop the abstractness of constructions based on the type frequency of constructions.

Growth of Grammatical Awareness among L1 Learners

Tomasello (2005) developed the usage-based approach in the acquisition of children’s L1, claiming that children develop their grammar through social interactions. Tomasello (1992) collected the speech data of his daughter during the second year of her life, and concluded that a child developed language from whole to parts and parts to whole (Tomasello, 2005). By analyzing the data of her utterances, Tomasello (2005) established the five stages of children’s language acquisition based on the usage-based approach as follows; in the first stage of children’s language, they produce one word. He called children’s early one-word utterances as “holophrases” (p.36), such as “Rockin”, which was “first used while rocking in the rocking chair, then as a request to do so, and then as a name for the object” (p.36). Moreover, Tomasello (2005) mentioned that “most children begin language acquisition by learning some unparsed adult expressions as holophrases – such expressions as *I-wanna-do-it*, *Lemme-see*, and *Where-the bottle*” (p.38). In other words, children perceive adults’ expressions as a whole at this stage. At the second stage of language development, which begins at around 18 months of age, “many children combine two words or holo-

phrases in situations in which both are relevant” (p.114), such as “Ball table” (p.114). Tomasello (2005) explained that children “partition the experiential scene into multiple symbolizable units” (p.114) in this period. At around the same period, children begin pivot-like expressions, such as “More _” (More milk, More grapes, More juice) (pp.114-115). This shows that children start to produce the expressions with a slot filled by variable words, which suggests that children are developing the abstractness of their grammar. Then, at around two years of age, children produce “item-based constructions” (Tomasello, 2005, p.117). At this stage, children’s utterances are verb-specific, thus the number of constructions of a verb is different from verb to verb. For example, some verbs have only one type of construction such as “Cut _”, whereas other verbs are used in several constructions such as “Draw _”, “Draw _ on _”, “Draw _ for _”, and “_ draw on _” (Tomasello, 2005, p.117). Furthermore, a slot is filled with a word having the same function, and the function of a word in the slot is verb-specific. For example, for the verb “kiss”, children perceive that “kisser” comes before the verb “kiss”, and “person kissed” comes after the verb “kiss”. The same is true for the verb “break”; they notice that “breaker” comes before the verb “break”, and “thing broken” comes after the verb “break” (Tomasello, 2005, p.118). Their perception of a category of words filled in a slot is verb-specific and not generalized, and they do not form the abstract syntagmatic categories, such as “agent” and “patient” (Tomasello, 2005, p.118). Then, the last stage of L1 development occurs during preschool years. Children generalize across several item-based constructions and develop into abstract constructions (Tomasello, 2005).

Growth of Grammatical Awareness among L2 Learners

In the study of L2 learning, several researchers have claimed that the processes of L2 learning go from whole to parts to parts to whole, as Tomasello (2005) stated in L1 acquisition. In L2 learning, young learners recognize language as a whole, similar to how children do in L1 acquisition. L2 learners learn unanalyzed chunks in the first stage, forming the basis of acquiring more abstract grammar (Cameron, 2001; Hakuta, 1976; Wong-Fillmore, 1976; Myles,

Hooper, & Mitchell, 1998; Myles, Mitchell, & Hooper, 1999). In the initial stage of L2 learning, chunks account for a large proportion of learners' utterances (Hakuta, 1976). Hakuta (1976) commented that chunks help L2 learners to express their opinions; they mostly use rote-memorized chunks for communication, because they are not able to construct language based on linguistic system from scratch (p.333). In other words, chunks facilitate L2 learners' communication in the initial stage. Based on Hakuta (1976), Ellis (2002) noted that in L2 learning, children firstly recognize L2 language as a chunk, and they come to analyze its components as they develop their language. Cameron (2001) also noted the importance of chunks in early stage of L2 learning, stating that "the chunk may be used as a whole for some time, but it is available to be broken down and parts re-used with other verbs" (p.98). L2 learners come to parse chunks as they develop their L2 and reuse these expressions with other words, expanding their creative use of language (Imura, 2013; Myles, Hooper, & Mitchell, 1998).

With regard to foreign language teaching in public elementary schools in Japan, some studies investigated their grammatical awareness (Eguchi, 2020; Monoi et al., 2015; Uchino, 2019; Uchino, 2021; Urata et al., 2014). These studies mainly used a grammatical judgment test using pictures (Monoi et al. 2015; Urata et al. 2014), a grammatical judgement test without pictures (Eguchi, 2020; Uchino, 2019; Uchino, 2021), a metalinguistic knowledge test (Uchino 2019; Uchino 2021), and an imitation task (Eguchi, 2020). However, none of the studies clarified what kind of grammatical awareness students had. Moreover, some studies, such as Monoi et al. (2015) , Uchino (2019) and Uchino (2021), pointed out the importance of frequency in foreign language learning. However, none of them defined what the "frequency" was in their study. In addition, none of these former studies successfully created the test that would reveal the comprehensive grammatical awareness of Japanese students learning English in public elementary schools.

Current Research

The current study is designed to examine what kind of grammatical aware-

ness young Japanese EFL learners have, focusing on the frequency of exposure to grammatical items. This test is quite new and is the first test that aims to investigate comprehensive grammatical awareness of Japanese students learning English in public elementary schools, based on the frequency of grammatical items. This study uses this test to analyze the data and aims to identify which items should be revised and how they should be revised.

As previously mentioned, usage-based theorists claimed that frequency plays a crucial role in language development. In L1 acquisition, several researchers, such as Tomasello (2005), have found that this is true for L1 acquisition; children develop their grammar based on the frequency of input in the acquisition of their mother tongues. However, in the studies of elementary school students' English learning, none of the previous studies were able to show the clear relations between the development of grammatical items and the frequency to be exposed to them. Since there is a similarity between L1 acquisition and foreign language learning, it is clear that frequency is a key to developing the grammatical awareness among young EFL learners. Therefore, this study hypothesizes that frequency plays a crucial role in the development of foreign language grammar in elementary school classes. The current study expects that there will be differences between the results obtained from 5th graders and those from 6th graders because 6th graders had received more input of English than 5th graders at the time of the test.

In Japan, elementary school students in 5th and 6th grades have two foreign language classes a week, totaling 70 classes a year. Students take 70 class hours of foreign language classes a year, which equals 52.5 hours a year. This means that 6th graders in this study had received 52.5 hours more instruction than 5th graders by the time of the test. Consequently, 6th graders had encountered much more foreign language input than 5th graders, which should affect the difference in grammatical development between these two grades.

Thus, the present study addresses the following three research questions: (a) Are the items developed by Allen-Tamai (in press) appropriate for measuring the grammatical awareness of young Japanese learners of English? (b) What kind of grammatical awareness do these students possess? And (c) Is there a

difference between 5th and 6th graders in their grammatical awareness?

Method

Participants of this study were students in a public elementary school in Ishikawa Prefecture, involving 53 participants in the 5th-grade group and 57 in the 6th-grade group. The permissions for participation of the study were obtained from the teachers and the principal of the school, and the board of education.

Instruments

This study used a test created by Allen-Tamai (in press). This test was created based on the usage-based approach, focusing on the frequency of grammatical items; she selected the following four grammatical items, such as “Pronoun”, “Can”, “Past tense”, and “Word order”. These are the main grammatical items appearing in the textbooks (Allen-Tamai et al., 2019a; Allen-Tamai et al., 2019b). For example, “Pronoun” appears in Unit 4 and Unit 8 in the textbook for 5th graders, “Can” appears in Unit 4 in the textbook for 5th graders and Unit 3 for 6th graders. “Past tense” appears in Unit 4 and Unit 7 in the textbook for 6th graders, and “Word order” appears in Unit 5 in the textbook for 6th graders. These grammatical items appear repeatedly; thus, it is considered that students encounter them with a certain degree of frequency. In addition, these grammatical items are used in communicative activities, which are usually located at the end of each Unit. Therefore, it is expected that students would be familiar with these grammatical items.

In this test, participants looked at a picture on the test paper and listened to a CD. If the sentence that they heard described the picture correctly, the participants put a circle in parenthesis, and if it does not match the picture, they put an × in parenthesis.

There were 12 items for each, “Pronoun”, “Can”, and “Past tense”, whereas “Word order” had eight items; thus, this test had 44 items in total. The data on “Pronoun”, “Can”, and “Word order” were obtained from both 5th and 6th graders. The data of “Past tense” were only obtained from 6th graders; 5th

graders did not take the “Past tense” test because they had not learned the past tense in their English classes.

In the study, the researcher visited classes, explained how to take the test, and played the recorded script from a PC. The script had been recorded by a female undergraduate student, who had lived in the United States for four years, from the ages of 7 to 11. She studied English education for elementary school students. Scripts were played twice for each item. However, for items D06–D08 in “Word order”, each script was played once, and students chose a correct answer among three choices.

Data Analysis

Table 1 shows scripts of three items from each test, and why they were wrong (See Appendix for the whole items). “T” means a correct item and “F” means an incorrect item.

In order to detect the items that need revision, this study analyzes the item facility (IF) and the item discrimination (ID) of each item from 5th and 6th graders, respectively. IF is the percentage of participants who answered correctly. The IF value is the most suitable if it is 0.50, and the item is good if the IF value is between 0.30 and more and 0.70 and less (Brown, 2005, as cited in Takeuchi & Mizumoto, 2014, p.209). If the value is less than 0.30, then the item was considered too difficult, and if the value is more than 0.70, it was considered too easy. However, since the participants of the study are elementary school students, and they do not learn grammatical items explicitly, it is considered that the item is too difficult for them when the IF value is 0.70. Considering participants’ age and their learning environment, the IF value is appropriate up to 0.85. Therefore, in this study, the item is considered good if the IF value is between 0.30 and higher and 0.85 and lower.

Regarding item discrimination (ID), this study utilized the upper–lower item discrimination index. If the item discrimination index is 0.40 and higher, then the item can discriminate between the upper and lower groups. This means that the item is appropriate. On the other hand, if the item discrimination index is 0.20 and less, this item does not discriminate between the upper and lower

Table 1*Descriptions of Each Item*

Items	Script	T/F	Points for the incorrect item
<u>Pronoun</u>			
A01	This is my father. He is a teacher.	T	
A02	This is my brother. She can play soccer well.	F	wrong pronoun use (brother, She)
A12	This is Ana. They are from America.	F	wrong pronoun use (Ana, They)
<u>“Can”</u>			
B01	A Cheetah can run fast.	T	
B02	An ant can run fast.	F	different from the fact
B03	A dog run fast can.	F	wrong word order
<u>Past tense</u>			
C01	I went to Kyoto.	T	
C02	I eat a hamburger steak for my dinner.	F	wrong tense (present)
C06	It fun was.	F	wrong word order
<u>Word order</u>			
D01	The girl hits the ball.	F	different from the scene in the picture
D02	The girl punches the boy.	T	
D03	The fish eats the cats.	F	different from the scene in the picture

groups. Therefore, the item is not appropriate (Takeuchi & Mizumoto, 2014, pp.209-210). In this study, an item is considered good if its ID index is more than 0.20.

Table 2 and Table 3 list IF and ID values for each item from 5th and 6th graders, respectively. Based on the above criteria, inappropriate values of IF and ID indices are highlighted in boldface in both tables. As a result, for 5th graders, items A08, B03, B04, B06, B10, D01, D04, and D05 deviate from normal range of IF and ID. Similarly, for 6th graders, items A01, A05, A08, B10, C04,

Table 2

IF and ID for Each Item from 5th Graders

<u>Pronoun</u>			<u>Can</u>			<u>Word order</u>		
Items	IF	ID	Items	IF	ID	items	IF	ID
A01	.87	.21	B01	.75	.43	D01	.19	.00
A02	.36	.57	B02	.81	.50	D02	.70	.14
A03	.91	.21	B03	.25	.07	D03	.30	.50
A04	.72	.50	B04	.08	-.07	D04	.94	.14
A05	.17	.21	B05	.53	.50	D05	.87	.14
A06	.66	.71	B06	.87	.14	D06	.70	.29
A07	.66	.21	B07	.79	.36	D07	.30	.36
A08	.15	.00	B08	.42	.29	D08	.36	.29
A09	.92	.29	B09	.53	.57			
A10	.43	.36	B10	.23	-.07			
A11	.75	.43	B11	.77	.43			
A12	.21	.43	B12	.53	.00			

Table 3

IF and ID for Each Item from 6th graders

<u>Pronoun</u>			<u>Can</u>			<u>Past tense</u>			<u>Word order</u>		
Items	IF	ID	Items	IF	ID	Items	IF	ID	Items	IF	ID
A01	.95	.13	B01	.79	.60	C01	.77	.53	D01	.35	.07
A02	.44	.47	B02	.88	.27	C02	.32	.27	D02	.75	.40
A03	.61	.47	B03	.26	.27	C03	.44	.07	D03	.46	.27
A04	.84	.40	B04	.18	.27	C04	.16	-.07	D04	.84	.20
A05	.16	-.07	B05	.44	.60	C05	.67	.47	D05	.95	.13
A06	.75	.47	B06	.86	.27	C06	.70	.53	D06	.63	.60
A07	.68	-.20	B07	.82	.33	C07	.30	.07	D07	.28	.13
A08	.09	.07	B08	.39	.47	C08	.32	.13	D08	.30	.07
A09	.82	.47	B09	.47	.27	C09	.84	.40			
A10	.63	.13	B10	.23	.00	C10	.53	.00			
A11	.88	.33	B11	.79	.27	C11	.95	.20			
A12	.33	.53	B12	.46	.07	C12	.72	.00			

C11, D05, and D07 deviate from normal range of IF and ID. Since subtests such as “Pronoun”, “Can”, and “Word order” were administered to both 5th and 6th graders, this paper defines “inappropriate items” as those which deviate from the previously mentioned range of appropriate values. However, since the subtest “Past tense” was conducted for only 6th graders, C04 and C11 are considered inappropriate because they deviate from the range of appropriate values for both IF and ID. Therefore, this study will identify A08, B10, C04, C11 and D05 as inappropriate items, remove them, and analyze the remaining data. The overall Cronbach’s alpha for all the subtests was .57 for 5th graders and .63 for 6th graders, respectively.

Considering the items D06-D08 in “Word order” subtest, they are multiple questions and there are three choices for each question. Among three choices, two choices are incorrect, and one choice is correct for each item (see Appendix for the items D06-D08).

Table 4 lists IF and ID values for each item of D06-D08 from 5th and 6th graders, respectively. Inappropriate values of IF and ID indices are highlighted in boldface. For the items D06a-D06c, IF values are high for both grades. This means that many students in both grades answered correctly. For D06c in particular, IF values are quite high, and ID indices are quite low for both grades. This means that D06c is not appropriate for a dummy item because this item is too easy and does not discriminate between the upper-scoring group and the lower-scoring group. Considering its script, the agent is contradictory to that in the picture, and the word order does not follow English grammar. Since most students answered correctly, it suggests that it was easy for them to understand that the agent was different from what the picture described, and the sentence they heard was ungrammatical. For the items D07a-D07c, IF values for item D07a are quite high for both grades, but those for the item D07c are low for both grades. It means that D07a did not function properly as a dummy item, because this item is too easy for students. It is speculated that students had not encountered the verb “pull” frequently, so many of them might not have known the meaning of the verb. Considering the picture of the item, the granddaughter does not touch the grandpa. Thus, even though many of them might not have

Table 4

IF and ID for D06a-D08c for 5th graders and 6th graders, respectively

	5th graders		6th graders	
Items	IF	ID	IF	ID
D06a	.70	.29	.63	.60
D06b	.83	.29	.67	.60
D06c	.87	.00	.93	.13
D07a	.87	.21	.81	.40
D07b	.30	.36	.28	.13
D07c	.42	.21	.40	-.07
D08a	.45	.00	.42	.20
D08b	.36	.29	.30	.07
D08c	.91	.29	.82	.07

known the meaning of the verb “pull”, they still comprehended that the grandpa and the granddaughter should not be directly related in the context. Consequently, many of them answered correctly for the item D07a. For items D08a-D08c, the IF values for the dummy item D08a are relatively low for both graders. It is speculated that in the “SVOO” construction, it might be challenging for students to grasp the word order of “OO” part correctly. On the other hand, the item values of D08c are quite high for both grades. Considering the script of D08c, the agent is clearly different from what the picture describes. It suggests that it was easy for students to understand the agent correctly.

Table 5 and Table 6 list the descriptive statistics of the total score of each grammatical item after removing inappropriate items for 5th and 6th graders, respectively. Next, the Shapiro–Wilk test was conducted to examine the normality of the data, but none of the tests were normally distributed for both grades.

Additionally, the Spearman rank-order correlations (ρ) were conducted to assess the relationships between the total scores of each test for each grade. Both tables show that there were significant correlations between some of the subtests. In addition, Table 7 indicates that for the data from 5th graders, there was a moderate correlation between the total scores of “Pronoun” and “Can”,

Table 5
Descriptive Statistics of Each Subtest of 5th graders

	<i>k</i>	<i>M</i>	<i>Mdn</i>	<i>sd</i>	<i>IQR</i>
Pronoun	11	6.66	6.00	2.03	2
Can	11	6.32	7.00	1.72	3
Word order	7	3.49	4.00	1.12	1

Table 6
Descriptive Statistics of Each Subtest of 6th graders

	<i>k</i>	<i>M</i>	<i>Mdn</i>	<i>sd</i>	<i>IQR</i>
Pronoun	11	7.24	7.00	1.55	2
Can	11	6.56	6.00	1.77	3
Past tense	10	5.65	6.00	1.44	1
Word order	7	3.60	4.00	1.24	2

Table 7
Correlations among the Total Scores of Subtests for 5th graders

	Pronoun	Can	Word order
Pronoun	—	.41**	.29*
Can	—	—	.35*
Word order	—	—	—

* p < .05. ** p < .01.

Table 8
Correlations among the Total Scores of Subtests for 6th graders

	Pronoun	Can	Past tense	Word order
Pronoun	—	.29*	.39**	.16
Can	—	—	.23	.31*
Past tense	—	—	—	.33*
Word order	—	—	—	—

* p < .05. ** p < .01.

but there were weak correlations among the total scores of the remaining subtests. Table 8 suggests that for the data from 6th graders, there were weak correlations among subtests.

A Friedman test was conducted to examine whether there was a statistically significant difference among the percentage of score on each subtest. For 5th graders, the results showed that there was a significant difference among the percentages of scores on “Pronoun”, “Can”, and “Word order”, $\chi^2 (2, n = 159) = 11.95, p = .003$. The mean rank of the percentage of score on the “Pronoun” test was the highest (2.20), followed by that of the “Can” test (2.18), and the “Word order” test (1.62). A pairwise test (with Bonferroni correction for multiple tests) indicated that there was a significant difference between the percentage of score on the “Can” test and that of the “Word order” test ($p = .012$), with a small effect size ($r = -.28$), and between the “Pronoun” test and the “Word order” test ($p = .009$), with a medium effect size ($r = -.37$). There was no significant difference between the “Pronoun” test and the “Can” test. For 6th graders, the results of a Friedman test showed that there was a significant difference among the percentages of scores on “Pronoun”, “Can”, “Past tense”, and “Word order”, $\chi^2 (3, n = 220) = 26.26, p < .001$. The mean rank of the percentage of score on the “Pronoun” test was the highest (3.19), followed by that of the “Can” test (2.52), the “Past tense” test (2.31), and the “Word Order” test (1.98). A pairwise test (with Bonferroni correction for multiple tests) indicated that there was a significant difference between the percentage of score on the “Pronoun” test and that of the “Word order” test ($p < .001$), with a medium effect size ($r = -.39$), between the “Pronoun” test and the “Past tense” test ($p = .002$), with a medium effect size ($r = -.33$), and between the “Pronoun” test and the “Can” test ($p = .038$), with a small effect size ($r = -.22$). There were no significant differences between each pair of the other tests.

Next, a Mann-Whitney U test was conducted to determine whether the percentage of scores on each subtest differed between the two grades. The Mann-Whitney U Test revealed no significant difference in the percentage of score on the “Pronoun” test between 5th graders ($Md = 54.55, n = 53$) and 6th graders ($Md = 63.64, n = 57$); $U = 1786, z = 1.68, p = .093, r = .16$, with a small

effect size. The Mann-Whitney U test revealed no significant difference in the percentage of score on the “Can” test between 5th graders ($Md = 63.64$, $n = 53$) and 6th graders ($Md = 54.55$, $n = 55$); $U = 1530$, $z = .45$, $p = .65$, $r = .04$, with little effect size. The Mann-Whitney U test revealed no significant difference in the percentage of score on the “Word order” test between 5th graders ($Md = 57.14$, $n = 53$) and 6th graders ($Md = 57.14$, $n = 57$); $U = 1646$, $z = .84$, $p = .40$, $r = .08$, with little effect size.

Discussion

Regarding the first research question (a), “Are the items developed by Allen-Tamai (in press) appropriate for measuring the grammatical awareness of young Japanese learners of English?”, items A08, B10, C04, C11 and D05 are the primary candidates for revision because they deviate from the range of appropriate values for IF and ID. However, since this study did not investigate Cronbach’s alpha for each subtest, other items should also be considered for revision in the test. One thing that should be considered for revision of the test is that the contexts of some items are vague. For instance, in the case of items A05 and A08, though the answers of these items are “F” (False), these items can be “T” (True) in specific contexts: if Haruka (A05) or Rho (A08) introduces themselves and points out their own pictures, these sentences should be considered “T”. Therefore, the revised items should provide the clearer context. For the subtest of “Can”, item B10 was inappropriate for both grades. It is speculated that it might have been difficult for students to understand the correct placement of the adverb (“well”) in a sentence. In addition, it should be noted that the pictures of some items are inappropriate. For example, regarding B08 and B12, it is unclear solely from these pictures whether the chicken (B08) and the monkey (B12) can swim or not, as they are just sweating by the poolside in the picture. In order to make the contexts clearer, the pictures should clearly depict that the chicken and the monkey cannot swim. One idea for the revision of the pictures is to show the chicken and the monkey are drawing in the pool, so that students might understand the context clearly. As for the subtest of “Past tense”, items C04 and C11 were inappropriate. Both of them have the verb

“enjoy”, and it is speculated that the “-ed” part is pronounced so softly that it might be difficult for students to distinguish between the present tense form “enjoy” and the past tense form “enjoyed”. With regard to the item D05, its IF values are quite high for both graders. The vocabulary is easy, and its answer is T. Since the vocabulary is too easy for students, one idea is to change the word order of the script, so that the answer will be F. Lastly, it should be noted that all subtests, except for “Pronoun”, ask about the point concerned with word order. Therefore, in the revised version of the test, some items in the “Pronoun” category should also address this point.

Regarding the second research question (b), “What kind of grammatical awareness do these students possess?” The results of Spearman rank-order correlations for both graders showed that there were significant correlations between subtests. Moreover, for 5th graders, “Pronoun” and “Can” correlated most, and for 6th graders, “Pronoun” and “Past tense” correlated most. However, their correlations were not so strong. The Friedman test and the pairwise test showed that the “Word order” test was significantly different from the other tests in the 5th grade. Likewise, the Friedman test and the pairwise test showed that the “Pronoun” test was significantly different from the other tests in the 6th grade. These results suggest that there are differences in the development of each grammatical item.

Furthermore, the results of IF value and ID index of each item suggest that vocabulary impacted the students’ understanding of the meaning of a sentence. For instance, IF values of items A01 and D05 are quite high, deviating from the range of appropriate values. The vocabulary in both of these items is easy and supposed to be familiar words for students. This suggests that the understanding of vocabulary and grammar is linked, which is in accordance with the usage-based theory, which claims that there is a continuum between words to syntax (Bybee, 2008; Croft, 2001; Goldberg, 1995; Langacker, 1987).

In addition, the item analysis for items D08a-D08c showed that IF and ID values of the dummy item D08a are relatively low for both graders, suggesting that in the double object construction, it might be challenging for students to grasp the word order of double objects part (the person given, and the thing

given) correctly. In contrast, the item values of D08c are quite high for both grades, leading to the conclusion that students understood that the agent (the giver) of the script was different from that in the picture. These results suggest that the degree of understanding differs between the subject (the giver) and double objects (the person given, the thing given) parts in the double object construction.

Regarding the third research question (c), “Is there a difference between 5th and 6th graders in their grammatical awareness?”, the study did not find any positive relations between the development of grammar and frequency. From the results, it is speculated that the differences of the input of a foreign language in classes between 5th and 6th graders are not enough to show the difference of grammatical awareness between these two grades. Since L1 acquisition is realized through sufficient input in the mother tongue, language development occurs as Tomasello (2005) claimed. On the other hand, considering the participants of the study, the input of the foreign language is clearly much less than that of the mother tongue. It is considered that the differences of the amount of input of English between 5th and 6th graders have little impact on the difference of grammatical development.

However, since English classes in an elementary school focus on listening activities and communication activities, elementary school students might have received a certain amount of input. As Tomasello (2005) claimed, children develop their grammar in the mother tongue through social interactions with other people. Therefore, it is expected that L2 learners might develop L2 through interactions with other people. Thus, Japanese elementary school students might develop a foreign language through communication activities. Furthermore, though the test by Allen-Tamai (in press) was created based on the main grammatical items in textbooks participants used, the test did not define what exactly “the frequency of grammar” was in the test. This might be one reason that the results of the present study did not show any differences in the development of grammatical aspect between the two grades, even though the frequency of exposure was different between the two groups. In other words, the test by Allen-Tamai (in press) was not created based on the frequency of

grammatical items in the specific sense. Therefore, in the revised test, the frequency should be specifically defined. Moreover, as is mentioned above, the current test has some inappropriate items. Thus, it is considered that by removing inappropriate items and revising the test, the results might be different.

Though this study was not able to show the clear relationships between the grammatical development and frequency of exposure in foreign language learning, it paves the way for revision of the test for the future research. Since grammatical development is essential for language learning, investigating grammatical awareness of young learners is particularly important. It is hoped that the test will be soon revised, and the relations between grammatical development and frequency of language exposure will be investigated in the near future.

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Appendix. Descriptions of Each Item

Items	Script	T/F	Points for the incorrect item
<u>Pronoun</u>			
A01	This is my father. He is a teacher.	T	
A02	This is my brother. She can play soccer well.	F	wrong pronoun use (brother, She)
A03	This is my grandfather. He is strong.	T	
A04	This is my grandmother. We are very kind.	F	wrong pronoun use (grandmother, We)
A05	This is me, Haruka. She is good.	F	wrong pronoun use (me, She)
A06	This is my mother. She can cook well.	T	
A07	This is Kenji. She is smart.	F	wrong pronoun use (Kenji, She)
A08	This is me, Rho. He is big.	F	wrong pronoun use (me, He)
A09	This is Ken. He can run fast.	T	
A10	This is Miku. We are students.	F	wrong pronoun use (Miku, We)
A11	This is Mei. She is from China.	T	
A12	This is Ana. They are from America.	F	wrong pronoun use (Ana, They)
<u>Can</u>			
B01	A Cheetah can run fast.	T	
B02	An ant can run fast.	F	different from the fact
B03	A dog run fast can.	F	wrong word order
B04	A rabbit can high jump.	F	wrong word order

B05	A snake can't jump high.	T (a negative sentence)
B06	A kangaroo can jump high.	T
B07	Fish can swim well.	T
B08	Chickens can't swim well.	T (a negative sentence)
B09	Penguins can't swim well.	F different from the fact
B10	Dogs well can swim.	F wrong word order
B11	Elephants can swim well.	T
B12	Monkeys swim can't well.	F wrong word order
<u>Past tense</u>		
C01	I went to Kyoto.	T
C02	I eat a hamburger steak for my dinner.	F wrong tense use (present)
C03	It was delicious.	T
C04	I enjoy talking with my friends.	F wrong tense (present)
C05	I saw many old temples.	T
C06	It fun was.	F wrong word order
C07	I go to the mountain.	F wrong tense (present)
C08	I camping enjoy with my family.	F wrong word order
C09	I ate the barbequed chicken.	T
C10	I see many birds in the woods.	F wrong tense (present)
C11	I enjoyed fishing.	T
C12	It is wonderful.	F wrong tense (present)
<u>Word order</u>		
D01	The girl hits the ball.	F different from the scene in the picture
D02	The girl punches the boy.	T
D03	The fish eats the cats.	F different from the scene in the picture
D04	The dog bites the boy.	F different from the scene in the picture
D05	The boy kicks the ball.	T
D06	a The wolf attacks Akazukin.	T

D06	b Akazukin attacks the wolf.	F	different from the scene in the picture
D06	c Akazukin the wolf attack.	F	wrong word order
D07	a The grandpa pulls the granddaughter.	F	different from the scene in the picture
D07	b The grandma pulls the grandpa.	T	
D07	c The grandma pulls the granddaughter.	F	different from the scene in the picture
D08	a Momotaro gives kibidango a monkey.	F	wrong word order
D08	b Momotaro gives a monkey kibidango.	T	
D08	c A monkey gives kigidango Momotaro.	F	wrong word order
