Sensitivity to Grammatical Definiteness in Anaphoric Contexts Among Japanese EFL Learners: Evidence From Grammaticality Judgments

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Abstract

This study investigated the ability of Japanese EFL learners to recognize incorrect definiteness marking on anaphoric noun phrases in English. Japanese EFL learners are known to have difficulty in accurately producing definite articles, but limited information is available regarding their capacity for using articles in constructing and maintaining text cohesion during reading. Twenty-two Japanese EFL university students performed a grammaticality judgment task on short passages containing either a direct or associative anaphoric reference, marked with either a definite or indefinite article. Results showed that participants judged the majority of passages as correct, regardless of whether the anaphoric reference was preceded by a correct definite article or an inaccurate indefinite article. This indicates that the participants were not sensitive to the definiteness condition for either direct or associative anaphoric references. These findings indicate that Japanese EFL readers either do not process articles at all during reading, or read them without understanding their function. Pedagogical implications are discussed in terms of options for improving awareness of the article system in classroom texts and environments.

1. Introduction

In reading natural texts, both narrative and explanatory, readers need to be able to unify multiple references to the same entity or event into a single text representation. The linguistic devices that make this possible are known as cohesive devices, and can exist both as grammatical words and structures (grammatical cohesion), as well as through lexical repetition and synonymy (lexical cohesion; Halliday & Hasan, 1976).

One kind of grammatical cohesion is anaphoric reference, a category of referential expressions including pronoun reference and definite noun phrases (NPs), which consist of the definite article, the, with a repeated word or synonym. Pronoun reference is a purely grammatical cohesive device, containing very minimal lexical content, while definite NPs combine grammatical and lexical cohesion. Due to this greater semantic explicitness, definite NPs are able to access antecedents across greater text distances than the less explicit pronoun-based anaphora. Definite NPs also have the interesting function of introducing new referents when they have a privileged relationship with a previously-mentioned entity. Thus, definite NP anaphora can be divided into two broad categories: direct anaphora and associative anaphora.

In both direct and associative anaphora, the contributions of both the grammatical the and the lexical repetition, synonym, or associated noun are essential to maintain text cohesion. Unlike other members of the
determiner category such as this or that, the cannot stand on its own as a noun phrase referencing some information available from context. Additionally, repeated nouns and synonyms are barred from anaphoric interpretation unless they are preceded by the definite article (or a more definite determiner, such as this or that), regardless of how contextually appropriate coreference may be.

Young native speakers of English are known to acquire accurate use of the definite article by pre-school age (Thomas, 1989), typically before they learn to read. The situation is known to be more complex for second-language (L2) learners of English however, with first-language (L1) factors known to interfere in the progression and success in developing accurate use of the article system (e.g., Luk & Shirai, 2009; Master, 1997). Studies of L1 readers of English have shown that correct application of the definite article facilitates integration of information across multiple sentences and decreases reading times, while use of the indefinite article in definite contexts reduces this integration (Gernsbacher & Robertson, 2002). However, very little is known about the relationship between article proficiency and reading in L2 learners, despite the significant role of the definite article in marking anaphoric reference, and the importance of anaphoric reference to text cohesion in English.

1.1 The Definite Article in English

The definite article in English, the, is a free grammatical morpheme and the most common word in English (Sinclair, 1991). It is often discussed in opposition to the indefinite article, a/an, however the two articles have quite different grammatical featural specifications. Definite articles can occur with any common noun in English as long as the discourse context is appropriate; on the other hand, the indefinite article is restricted to occur only with count nouns in the singular, with some phrasal exceptions. The featural complexity of the article system is often considered one of the factors contributing to the challenges it poses L2 learners (Master, 2002).

Although the featural specification for the definite article is simpler than for the indefinite article, its single feature of definiteness is so complex that despite being the subject of several substantial works (e.g., Hawkins, 1978; Lyons, 1999), its precise definition remains unclear. Definiteness is currently considered to be composed of two sub-features, identifiability and inclusiveness, which partially overlap each other but are difficult to either fully combine or fully separate. Identifiability is a signal to the reader that they should attempt to locate the entity in question in their mental model of the text, while inclusiveness requires that the definite description must refer to the whole of the entity being referenced (Lyons, 1999). Hawkins (1978) formally identified eight categories that the reader can reference in order to locate the referent of a definite description, including from within the text (anaphora and cataphora), from within the reader’s pre-existing knowledge, or from within the reader’s physical proximity. These identifiability categories can overlap in a given NP, if for example a particular referent is identifiable both from within the text and within pre-existing knowledge.

The article system is known to pose significant challenges for L2 learners of English. Multiple studies have been conducted in order to investigate a possible L1 effect in article acquisition; a 2009 review of these studies confirmed the existence of an L1 effect (Luk & Shirai, 2009). Master (1997) showed that the existence or absence of an article system in the learner’s L1 is a significant factor in both the difficulty and success of article acquisition. Master particularly noted the tendency among L2 English learners to overuse the definite article in the early stages of its acquisition, indicating that they understood the syntactic requirement for an article, but not the discourse-based
limitations on its use. English proficiency has also been identified as a factor in accurate use of the definite article. Investigating Japanese students of English as a foreign language (EFL), Mizuno (1999) and Butler (2002), concluded from separate studies that errors in article usage decreased as English proficiency rose, and moreover, that the kinds of errors changed as proficiency increased. Syntactic usage errors were only evident in lower-level learners, while discourse-based errors persisted in intermediate and advanced learners. Liu and Gleason (2002) more specifically investigated use of the definite article among English as a second language (ESL) students from varied L1 backgrounds and found that learners were able to provide an appropriate definite article more accurately in some identifiability contexts compared to others. Anaphoric the was provided quite accurately even by less proficient learners, while uses calling on general knowledge remained poorly acquired even in advanced learners. However, the anaphora category in this study combined direct and associative anaphora into a single category, even though associative anaphors are quite different from direct anaphors (Hawkins, 1978).

1.2 Direct and Associative Anaphora in English

Hawkins (1978) identified two categories of anaphora that are expressed through definite descriptions in English: direct anaphora (“anaphora” in Hawkins) and associative anaphora. Direct anaphora is a definite description consisting of a definite article preceding a repeated noun, synonym, or superordinate of a previously-introduced entity, while associative anaphora is a definite description in which a definite article precedes a new entity in the text. Examples of these types of anaphora are displayed in italics in (1) and (2):

(1) I have to leave my house by 7 AM to get to class on time. The class is really interesting, so I don’t mind waking up early.
(2) I have to leave my house by 7 AM to get to class on time. The teacher is really interesting, so I don’t mind waking up early.

Direct anaphora is considered to be a simpler construction than associative anaphora, but it is known to take longer to process when the anaphor takes the form of a synonym (e.g., Dell, McKoon, & Ratcliff, 1983) or superordinate expression (e.g., Duffy & Rayner, 1990), as opposed to a repetition of the antecedent noun.

The associative anaphor construction is highly productive in English (Charolles, 1999), but represents a much more complex part-whole relationship between the anaphor and antecedent, compared to the direct reference of the direct anaphor. Associative anaphors must be “stereotypical and necessary” and “highly salient” parts in relation to their antecedent’s whole (Charolles, 1999; Miéville, 1999), but cannot be used in reference with animate entities (Kleiber, 1999). Furthermore, parts of parts are not eligible to become associates: a library may be an associate of a town, and books an associate of library, but books does not then qualify as an associate of town (Charolles, 1999; Miéville, 1999). What does and does not qualify as an appropriate associate is highly reliant on cultural knowledge and expectations, and moreover, certain associations are more strongly linked to the antecedent than others. This strength of association between associative anaphor and antecedent has also been linked to different processing strategies during reading, with strongly associated anaphors appearing to be processed using
forward inferencing strategies from the antecedent, while weak associates are processed using backwards inferencing from the anaphor (Lavigne-Tomps & Dubois, 1999).

From an L2 reading perspective, associative anaphora poses two problems. The first is the additional processing demands necessary to apply forwards and backwards inferencing during reading. As L2 readers are required to devote more of their cognitive resources to lower-level processing during reading as compared to L1 readers (e.g., Horiba, 1996, 2000) their ability to generate the inferences involved in associative anaphora may be impaired. The second problem is that many learners report that in their English lessons, they are told to use the with old information, and a/an with new information. However, associative anaphora does not obey this rule, introducing information with the in order to link it with old information, but nevertheless not referencing old information.

While some kinds of anaphoric resolution have received significant attention in L2 acquisition studies, there is little data available regarding direct or associative anaphora of the type discussed here. Thus it remains unknown what effect associative anaphora has on L2 reading comprehension.

1.3 The Present Study

Previous investigations of the English article system in L2 learners have utilized productive tasks, and have consequently only been able to provide indirect data on use of the system during reading. Moreover, previous investigations into the article system in L2 learners have asked participants to either provide or judge the accuracy of articles in texts, explicitly informing the participants of the structure under study.

The goal of this study was to investigate whether Japanese EFL readers were sensitive to (i.e., capable of recognizing) the definiteness of anaphoric contexts during reading, as opposed to in a written test. To this end, a computer-based, visual modality grammaticality judgment task (GJT) methodology was adopted. In computer-based visual modality GJTs, the participant views a sentence on a computer screen and is asked to press one button to indicate a judgment of grammaticality, and another to indicate a judgment of ungrammaticality. GJTs have been used to investigate Japanese proficiency in the article system previously (Takahashi, 2000), in addition to other morphological features such as the plural morpheme (Kusanagi & Yamashita, 2013). As Kusanagi and Yamashita found that their participants experienced great difficulty in completing the items within time limits (timed GJT), an untimed GJT was adopted in the present study. This study utilized two-sentence passages as stimuli in order to assess the processing of direct and associative definite noun phrases in L2 learner English reading, according to the following research questions:

RQ 1: Are Japanese EFL learners sensitive to definiteness in direct anaphoric contexts?
RQ 2: Are Japanese EFL learners sensitive to definiteness in associative anaphoric contexts?
RQ 3: Do Japanese EFL learners have an equal sensitivity to definiteness in both direct and associative anaphoric contexts?
2. Method

2.1 Participants

Twenty-two Japanese university students participated in this study. All participants spoke Japanese as their L1, and had studied EFL English for a minimum of six years as a part of the regular schooling in Japan. The participants were in the first three years of their undergraduate degrees, in majors including medical and biological sciences, social sciences, engineering, and information technology. Only two participants had significant experience of studying English in an ESL context. A cloze test was created and administered as a measure of overall English proficiency due to the participants’ relatively diverse academic backgrounds. Participants were presented with an English text of approximately 250 words that had had every sixth or seventh word removed, for a total of 33 blanks. They were asked to provide appropriate words to fill in each blank. Answers were considered correct if they were contextually acceptable, even when they differed from the original text. As a result of this test, one participant was identified as an outlier and removed from the data set. The remaining participants were estimated to be of lower-intermediate to intermediate English proficiency. A summary of the cloze test data is presented in Table 1.

Table 1
Cloze Test Results

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
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<tbody>
<tr>
<td>Score</td>
<td>25.43</td>
<td>2.29</td>
<td>22</td>
<td>29</td>
</tr>
</tbody>
</table>

*Note: Maximum possible score was 33.*

2.2 Stimuli

This study contained 32 experimental passages and 32 filler passages that also served as distractor items. Half of the passages were followed by comprehension questions. The stimuli were controlled for length (10-14 words), grammatical complexity, and vocabulary difficulty. All stimuli were developed by the author and assessed for grammaticality by eight native English-speaking informants. Sentences were revised or replaced if two or more informants considered them in any way ambiguous, or if there was disagreement between informants on the grammaticality of the item. Additionally, as many informants preferred to describe the ungrammatical passages as “strange” or “doesn’t make sense in the context”, as opposed to “grammatically incorrect”, task instructions were revised to include these criteria as reasons to make a judgment of “ungrammatical”. Task instructions were written in Japanese by the author and a native speaker of Japanese.

**Experimental passages.** Each experimental passage consisted of two sentences, containing an antecedent noun in sentence 1 (S1), and an anaphor referencing the antecedent in sentence 2 (S2). Four minimal-pair versions of each S2 were created, differing only in the article and noun occurring in the target NP: definite article and direct anaphor (DD), definite article and associative anaphor (DA), indefinite article and direct anaphor (ID), and indefinite article and associative anaphor (IA). This design is illustrated with examples in Table 2.
In the definite condition, target NPs were headed by the, while target NPs in the indefinite condition were headed by a or an as appropriate. To avoid grammatical violations in the indefinite condition, all target NPs contained singular count nouns. Target NPs in the direct anaphor condition contained a verbatim repetition of the antecedent noun, while target NPs in the associative anaphor condition contained an acceptable associate of the antecedent noun that did not introduce semantic or syntactic violations to the sentence. As the minimal-pair design was prioritized over examining specific varieties of associates, the nature of the part-whole relationships included was not considered during materials development.

There was a concern that the DD condition did not represent authentic English, as natural English texts do not typically contain repetitive direct anaphors in the sentence directly following their antecedent. Multiple L1 English informants were consulted, and while some informants felt that the construction was strongly inelegant, they accepted it as both comprehensible and grammatically correct.

Table 2

*Stimulus Design with Examples*

<table>
<thead>
<tr>
<th>Article type</th>
<th>Anaphor type</th>
<th>Condition label</th>
<th>Sample stimulus</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Definite article</td>
<td>Direct anaphor</td>
<td>DD</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Definite article</td>
<td>Associative anaphor</td>
<td>DA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Indefinite article</td>
<td>Direct anaphor</td>
<td>ID</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Indefinite article</td>
<td>Associative anaphor</td>
<td>IA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Four different experimental stimuli sets were created, each containing all experimental passages, but differing in the condition in which each passage was presented. Thus, all passages were presented in all conditions, and all participants participated in all conditions, but each participant only viewed one version of each experimental passage.

**Filler passages.** The thirty-two filler passages were controlled for length and complexity in the same way as the experimental passages. These passages served as distractors to the experimental items in three ways. Sixteen filler passages contained correct uses of the indefinite article to balance the 16 incorrect uses that would appear in the trial. Eight filler passages contained incorrect or borderline incorrect uses of the definite article, and the final eight contained possessive adjectives as target NP heads instead of an article. The same filler passages were used in all four stimuli sets.

**Comprehension questions.** Comprehension questions (CQs) directly followed 50% of passages. The CQs were simple yes/no questions targeting information from the S1s that was not repeated in the S2s. These served as both a distractor task and to ensure that the participants had read the S1. The same CQs were used in all stimuli sets.

### 2.3 Procedure

This study used a non-timed, computer-based GJT. Stimuli were presented in a sentence-by-sentence format and data were collected using SuperLab 5 software and compatible response pad (Cedrus Corporation). Each experimental and filler passage was presented using three screens (Initial Fixation, S1, S2), with an additional three screens for the CQs in those passages containing them (CQ Fixation, CQ, CQ Feedback). Feedback on judgment accuracy was not provided after experimental judgments in order to minimise any possible learning effects. Screen progression was controlled by the participants except for the CQ Fixation and CQ Feedback screens, which proceeded automatically after a set interval. Details of passage progression are illustrated in Figure 1.

![Figure 1. Stimulus unit progression including distractor sequence.](image)
questions were presented before starting the trial in order to familiarise the participants with the test format and use of the response pad. The experimental and filler stimuli passages were then presented in a randomized order. The cloze test was administered following completion of the GJT.

2.4 Analysis

The number of correct GJT responses per condition were tallied and expressed as a percentage to create an accuracy rating in each condition for each participant. The judgment required for a correct GJT response differed by category: “grammatical” in the definite article conditions, and “ungrammatical” in the indefinite article conditions. In order to investigate the effects of the article and anaphor factors on accuracy, a 2 (article type) by 2 (anaphor type) repeated-measures analysis of variance (ANOVA) was carried out. While the GJT methodology and presentation software also allow for the collection of response time data, the experimental design of this experiment made analysis of this data unreliable; thus, only judgment accuracy data were used.

3. Results

Descriptive statistics for judgement accuracy are presented in Table 3 and Figure 2. The data shows that in the definite condition, participants made consistently accurate grammaticality judgments, while in the indefinite conditions, accuracy was consistently low. Two observations can be made looking at the average accuracy ratings alone. Firstly, as participants accurately judged the grammatically correct sentences as grammatical in an average 7 and 6.5 items out of 8, it is unlikely that the materials contained any third factor that negatively impacted the validity of the results. Secondly, it is likely that the article condition had a significant effect on participant accuracy.

Table 3

| Mean Judgment Accuracy, by Category and Totals, in Points per Category |
|-------------------------|-----------------|----------|
|                         | M               | 95% CI   | SD       |
| DD                      | 7.00            | [6.52, 7.48] | 1.05     |
| DA                      | 6.52            | [5.90, 7.14] | 1.37     |
| ID                      | 2.10            | [1.05, 3.15] | 2.30     |
| IA                      | 1.05            | [0.16, 1.94] | 1.96     |
| Total                   | 4.17            | [2.97, 5.37] | 2.63     |

Note: Maximum possible score per category is eight points.

A 2 (article type) by 2 (anaphor type) repeated-measures ANOVA was conducted to determine whether either of the experimental conditions had a significant effect on participant accuracy in the GJT. The ANOVA
yielded significant main effects for both Article Type, \( F(1, 20) = 125.39, p < .001, \eta^2 = .93 \), and Anaphor Type, \( F(1, 20) = 7.67, p < .05, \eta^2 = .02 \), however the very low effect size for Anaphor Type indicates that despite achieving significance, the Anaphor Type factor did not have a large effect on GJT accuracy. The interaction between Article Type and Anaphor Type did not achieve significance, \( F(1, 20) = 1.47, p = .239 \).

In response to RQ 1 and RQ 2, the data clearly shows that Japanese EFL learners do not demonstrate any sensitivity to the definite condition in reading, in either direct or associative anaphoric contexts, as they could not recognize the incorrect conditions as incorrect. The high accuracy in the grammatical Definite Article condition but low accuracy in the Indefinite Article condition showed that the participants had essentially no awareness that the Indefinite Article condition items were incorrect.

In response to RQ 3, while the raw accuracy rates and significant main effect of the Anaphor Type variable suggested a slightly lower judgment accuracy for associative anaphors compared to direct anaphors, the very low effect size of the ANOVA suggests that this is not a meaningful difference. Taken in conjunction with the significant Article Type result, the Japanese EFL readers in this study displayed an equal insensitivity to definiteness regardless of the type of anaphoric context.

4. Discussion

The results of this study support the following three observations about Japanese EFL learners’ sensitivity to definiteness during reading:

(1) Japanese EFL learners are not sensitive to the definiteness of direct anaphoric noun phrase references.

(2) Japanese EFL learners are not sensitive to the definiteness of associative anaphoric noun phrase references.

(3) Japanese EFL learners are equally insensitive to the definiteness of both direct and associative anaphoric noun phrases.

Regarding the processing of articles, this study presents strong evidence that at least among lower-intermediate and intermediate EFL learners, definiteness is not a noticed feature during reading. There are two
possible explanations for this: (a) the participants read the articles but are not sensitive to the feature of definiteness, and (b) the participants completely ignore the articles and do not attempt to read them.

These results contradict many previous studies that have shown a strong sensitivity to anaphoric contexts in EFL and ESL learners (e.g., Butler, 2002; Liu & Gleason, 2002; Mizuno, 1999). Differences between this study and previous research must therefore be considered in an attempt to explain these results. There were two deliberate differences between this study’s experimental design and previous experimental designs. The first difference was the investigation of articles through a non-productive task, the GJT. Where Mizuno (1999), Butler (2002), and Liu and Gleason (2002) all asked their participants to produce an appropriate article in an appropriate context, this study only required that they read sentences containing articles. This is connected to the second difference, which was that the instructions for this experiment deliberately did not mention the construction under observation. This was only possible because production was not required, thus the instructions could simply ask the reader to judge the overall grammaticality of the passages. If this is the cause of the difference between the present and previous studies, then it may be that there is a significant gap between Japanese EFL learners receptive and productive, or possibly implicit and explicit, knowledge of the definite article and article system.

A second issue raised by these results is that of what this near-total insensitivity to definiteness in anaphoric contexts indicates about the processing of both anaphors and articles in Japanese EFL reading. Because the effect size of the Anaphor Type main effect was so low, it was impossible to conclude that it made a strong impact on the results in this experiment. However, because it did achieve significance, it also cannot be said that there is no difference between the two. More research is required to determine how Japanese EFL learners process these different kinds of anaphors.

5. Conclusion

5.1 Limitations of the Present Study

The present study contained several limitations leading to considerations for future research. Firstly, while the untimed GJT methodology is able to provide information about the knowledge possessed by learners, it cannot provide insights into the participants’ linguistic processing of the passages. However, as discussed by Kusanagi and Yamashita (2013), L2 processing demands may also limit the usefulness of the timed GJTs in EFL research. Thus, future research on this topic should instead consider such methodologies as think-aloud tasks or eye-tracking as a way to measure and describe the processing that EFL readers undertake when encountering definite anaphoric NPs.

Regarding the participants of this study, both overall number of participants, and their English proficiency level, somewhat limit the generalizability of the study’s results. The lower proficiency level may have been a factor in the insensitivity to definiteness observed, as this lack of awareness was also observed among lower-proficiency groups in previous studies investigating article use (Butler, 2002; Liu & Gleason, 2002). Thus, future research must include learners of multiple proficiency levels in order to investigate whether a similar increased sensitivity to incorrect article use during the reading of texts exists among higher-proficiency readers. The overall low number of participants in this study also limit the confidence with which these results can be generalized; subsequent research must confirm this effect among larger learner populations.

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5.2 Pedagogical Implications

The results of the present study demonstrated that Japanese EFL readers do not notice erroneous uses of the indefinite article in definite anaphoric contexts during reading. The most important pedagogical implication of this result is that it raises the possibility that Japanese native speaking teachers of English be unable to detect article errors in their students writing. Without feedback on incorrect forms, students will be unable to develop self-monitoring of those forms in future writing, leading to habitual errors. Thus, additional exercises need to be introduced to help students develop awareness of why articles are used in certain clauses in their reading comprehension texts, and how to apply that usage in their own writing. The ubiquitous nature of the article system means that existing texts can be adapted to this purpose. For example, in a reading comprehension passage, a selection of articles may be underlined, and students asked to provide the reason why that article is used there, either spontaneously or from a number or set options.

For Japanese L1 teachers of English who lack confidence in their own ability to monitor correct article use, one solution could be to ask English L1 assistant teachers for more assistance in judging whether articles are used accurately, as native speakers can make this judgment instinctively. However, native English speakers do not usually possess explicit grammatical knowledge of the reasons behind uses of the article system. Thus, the onus must still be on teachers to develop and communicate an explicit understanding of the reasons behind article uses to their students through established pedagogical methods for discourse and morphology.

References


