L2 Acquisition of the Specificity of Japanese Numeral Quantifiers

Tokiko Okuma

1. Introduction

This study investigates L1 Chinese (Mandarin) speakers’ acquisition of specific/non-specific distinction in Japanese numeral quantifiers. In Japanese, numeral quantifiers followed by a classifier (NCs) can appear in either a prenominal position (e.g., *futa-ri-no gakusei-o* ‘two-CL-Gen student-Acc’) or a floating position (e.g., *gakusei-o futa-ri* ‘student-Acc two-CL’), and the latter are subject to a semantic restriction: The floating NCs only have a non-specific reading, while the prenominal NCs have either a specific or non-specific reading. Nevertheless, the applicability of this semantic restriction has been overlooked, and few empirical attempts have been conducted to examine it.

This paper is structured as follows: Section 2 explains the interpretations of floating and non-floating NCs in Japanese and Chinese. Section 3 presents a previous L2 study on distinct word order and sentence interpretation (Okuma 2019). Section 4 raises two research questions. Section 5 explains the methodology, a forced-choice task, to explore the research questions. Sections 6 and 7 present the results and discussion. This is followed by a conclusion, suggesting that L2ers can successfully acquire subtle interpretative differences between different L2 forms.

2. Linguistic property

2.1. Semantic restriction on Japanese floating quantifiers

It is known that Japanese numeral quantifiers followed by a classifier (NCs) appear in different syntactic positions. For example, in all three sentences in (1), the NC *futa-ri*, which consists of the numeral *two* and the following classifier *ri* ‘people,’ modifies the direct object, *gakusei* ‘students,’ though the NCs occur in different positions in the sentences. In (1a), the NC occurs in the prenominal position. In (1b), the NC is in the postnominal position within the object NP. In contrast, in (1c), the NC is separated behind the object NP. I will call the NCs separated from the host NPs, like (1c), floating NCs, following the convention in linguistic literature (Nakanishi 2008).

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These three types of NCs are different not only in terms of their syntactic positions, but also in terms of their meanings. The prenominal NC constructions have either a specific or non-specific reading. For example, the sentence in (1a) can mean that Professor Yamada is looking for two students whoever they are (i.e., non-specific reading), or for two particular students—for example, Mary and Jane in his class (i.e., specific reading). In contrast, the postnominal NC constructions only have the specific reading as in (1b). The floating NC constructions only have the non-specific reading, as shown in (1c). In other words, the postnominal NC constructions and the floating NC constructions are subject to the semantic restriction. Among the three types of Japanese NCs in (1), the present study focuses on the prenominal NCs (1a) and the floating NCs (1c).

(1) Japanese NC constructions
a. Prenominal NC (specific/non-specific)
Yamada sensei-wa [futa-ri-no gakusei]-o sagashi-teiru.
 ‘Professor Yamada is looking for two (specific/non-specific) students.’

b. Postnominal NC
Yamada sensei-wa [gakusei futa-ri]-o sagashi-teiru.
 ‘Professor Yamada is looking for two (specific/*non-specific) students.’

c. Floating NC (non-specific)
Yamada sensei-wa [gakusei-o] futa-ri sagashi-teiru.
 ‘Professor Yamada is looking for two (*specific/non-specific) students.’

The reason why NCs have different interpretations depending on their positions is not conclusive. Downing (1996) suggests that the interpretive differences arise from information structure. For example, postnominal NC constructions are used for non-initial mentions of the referents. The postnominal NCs repeat information about the number that is already known to the listener. Therefore, the referents of postnominal NC constructions are typically specific, known to the listener. In contrast, floating NCs must carry new information about numbers, and accordingly, their referents are usually non-specific especially when they are used with an intentional verb, sagasu ‘look for’ as shown in (1c).

In contrast to Downing, Huang and Ochi (2014) point out the relation between the interpretive differences and syntactic structures. They propose that a specific indefinite nominal has a larger structure than a non-specific nominal. For instance, in their analysis, postnominal NC constructions (i.e., specific) have larger structures than prenominal NC constructions (i.e., specific or non-
specific) because postnominal NC constructions have an additional structure on top of CLP. Thus, Huang and Ochi (2014) offer very interesting observations about the specific interpretation and the size of the structure. However, all the relation between different NC constructions and their interpretation has been clarified. For example, it is left unexplained why floating NC constructions only allow non-specific interpretation.

2.2. Chinese quantifiers

Chinese (Mandarin) has classifiers, just like Japanese. However, unlike Japanese, Chinese classifiers always precede the host noun which they modify, and they are not separable from the host noun. (2) shows examples of Chinese indefinite nouns and their interpretation with respect to specificity (Huang and Ochi 2014, Ochi 2012).

(2) Chinese indefinite nouns (Huang and Ochi 2014, Ochi 2012)
   a. Bare N (e.g. shu ‘book’) non-specific only
   b. CL + N (e.g. ben shu ‘CL book’) non-specific only
   c. Num + CL + N (e.g. san ben shu ‘three CL book’) specific or non-specific

Thus, in Chinese, fixed word order disallows floating NCs; moreover, prenominal NCs have either a specific or non-specific reading, as shown in (2c). These differences between Japanese and Chinese are summarized in Table 1.

Table 1. Interpretive differences between Japanese and Chinese

<table>
<thead>
<tr>
<th>Structure</th>
<th>Reading</th>
<th>Japanese</th>
<th>Chinese</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Specific</td>
<td>Non-specific</td>
</tr>
<tr>
<td>Prenominal NC</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>(e.g. san-satu-no-hon-o)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Floating NC</td>
<td></td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>(e.g. hon-o san-satu)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In order to acquire the correct interpretation of Japanese prenominal and floating NCs, L1 Chinese speakers need to acquire two points. First, Japanese NCs can float. Second, Japanese floating NC constructions only have non-specific interpretation.

3. Previous L2 studies on interpretation of Japanese floating quantifiers


To the best of the author’s knowledge, few empirical attempts have been conducted to investigate the interpretation of Japanese NCs, with the exception
of Okuma (2019). Okuma investigated collective/distributive interpretations of Japanese floating NCs by L1 English speakers. As Ishii (1999) and Nakanishi (2008) have pointed out, non-floating NCs allow both distributive and collective interpretations, while floating NCs only allow distributive interpretation. For example, (3a) and (3b) could be interpreted to mean that three students worked individually and submitted three pieces of homework (i.e., distributive interpretation/multiple-event interpretation), or that three students worked together and submitted one homework (i.e., collective interpretation). In contrast, (3c) can only be interpreted as the former (i.e., distributive interpretation). Thus, floating NCs are subject to a semantic restriction that does not allow their collective interpretation, as shown in Table 2.

(3)

a. Non-floating 1 (prenominal)

[San-nin-no  
sakusei]-ga  kyoo shukudai-o  dasi-ta.
[three-CL-GEN student]-NOM today homework-ACC submit-PAST
‘Three students submitted homework today.’

b. Non-floating 2 (postnominal)

[Gakusei  
san-nin  ]-ga  kyoo shukudai-o  dasi-ta.
[student three-CL]-NOM today homework-ACC submit-PAST
‘Three students submitted homework today.’

c. Floating

Gakusei-ga  kyoo  san-nin  shukudai-o  dasi-ta.
student-NOM today three-CL homework-ACC submit-PAST
‘Three students submitted homework today.’

Table 2. Sentence types and their interpretations

<table>
<thead>
<tr>
<th></th>
<th>Distributive interpretation</th>
<th>Collective interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-floating NCs (pre/post-nominal)</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Floating NCs</td>
<td>✔</td>
<td>✗</td>
</tr>
</tbody>
</table>

Okuma investigated (i) whether the semantic restriction on floating NCs holds true in the grammar of native Japanese non-linguists, and (ii) whether the semantic restriction on floating NCs can be successfully acquired by L1 English speakers of L2 Japanese. The truth-value judgment task was administered to 22 native Japanese speakers and 18 L1 English speakers of L2 Japanese to compare their interpretations of postnominal and floating NCs in Japanese. The results suggested: (i) the semantic restriction holds firm in the grammar of native
Japanese non-linguists; and (ii) four out of the 18 L2ers successfully acquired the semantic restriction, despite it being absent in L1.

Thus, Okuma focused on the collective/distributive distinction between postnominal and floating NCs by L1 English speakers. The present study differs from Okuma in investigating specific/non-specific distinction between prenominal and floating NCs by L1 Chinese speakers.

4. Research questions

The present study investigates two points:

(4) a. Whether the specific/non-specific distinction between prenominal and floating NCs truly holds in the grammar of native Japanese non-linguists.

b. Whether L1 Chinese speakers of L2 Japanese can acquire the specific/non-specific distinction.

The first point in (4a) concerns the prominence of the semantic restriction on floating NCs among native Japanese speakers. As seen in Section 2, Huang and Ochi (2014) suggest that floating NCs must have the non-specific interpretation, not the specific interpretation, while prenominal NCs allow either the specific or the non-specific interpretation. However, to the best of the author’s knowledge, few empirical attempts have been made to examine whether native Japanese speakers truly make a distinction between prenominal NCs and floating NCs with respect to specificity. This study aims to clarify whether native Japanese speakers make a clear distinction between the prenominal NCs and the floating NCs. If they do, it follows that the semantic restriction which disallows the specific interpretation of floating NCs holds true in Japanese.

The second question (4b) seeks to clarify whether native Chinese speakers studying Japanese can correctly use the semantic restriction. Few L2 studies have investigated the interpretations of Japanese floating NCs by native Chinese speakers. The previous study, Okuma (2019), leads us to predict that advanced L1 Chinese speakers can successfully acquire the specific-non-specific distinction between Japanese NCs, just as the advanced L2ers in her study. This prediction is also compatible with Dekydtspotter, Sprouse, & Swanson (2001), which found that advanced L1 English speakers of L2 French had acquired subtle interpretive differences between different word orders despite the poverty of the stimulus situation.

5. Experiment
5.1. Participants

Thirty-two native Japanese speakers and 17 native Chinese speakers of L2 Japanese participated in the experiment. All native Japanese speakers were university freshmen (non-linguistics majors) who had never been abroad for
more than three months. They served as a control group. The L2ers were international students from China at a university in Japan at the time of testing. Their understanding of Japanese, including knowledge of grammar and vocabulary, was confirmed in a written cloze test adapted from Okuma (2015) consisting of 33 items. Their accuracy rates were between 39% and 97%, and their proficiency levels were judged as intermediate and advanced. Due to the limitation of the number, the L2ers served as one group in the statistical analyses later in this section. Table 3 summarizes the participants’ profiles. In the table, figures represent group means and ranges in the brackets.

Table 3. Participants

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Age (years old)</th>
<th>Age of first exposure to Japanese</th>
<th>Formal education (years)</th>
<th>Naturalistic exposure to Japanese (years)</th>
<th>Score on the Japanese proficiency test (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L2ers</td>
<td>17</td>
<td>22 (21-24)</td>
<td>19 (10-23)</td>
<td>2.7 (1.0-4.0)</td>
<td>1.1 (0.25-5.0)</td>
<td>77 (39-97)</td>
</tr>
<tr>
<td>Native Japanese speakers</td>
<td>32</td>
<td>19 (18-22)</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
</tbody>
</table>

5.2. Tasks

5.2.1. Pre-test

Prior to the main experiment, a pre-test was conducted to check whether the L2ers knew that Japanese allows floating NCs. In this small grammaticality judgment test, L2ers judged the degree to which they felt that the written Japanese test sentences were odd or natural on a 4-point scale from -2 (very odd) to +2 (perfectly natural). The test sentences were of four types: Non-floating 1 (prenominal), Non-floating 2 (postnominal), Floating 1, and *Floating 2, as shown in (5). Among the four types, the first three types were grammatical while the fourth one, *Floating 2, was not grammatical. Each type included four test sentences. They were randomized and presented to the L2ers.

(5) a. Non-floating 1 (prenominal)

\[
[\text{San-nin-no} \text{ gakusei}-\text{ga} \text{ booru-o} \text{ nage-ta}.]
\]

‘Three students threw a ball/balls.’

b. Non-floating 2 (post nominal)

\[
[\text{Gakusei san-nin}]-\text{ga} \text{ booru-o} \text{ nage-ta}.
\]

‘Three students threw a ball/balls.’
c. Floating 1
Gakusei-ga san-nin booru-o nage-ta.
student-NOM three-CL ball-Acc throw-PAST
‘Three students threw a ball/balls.’

d. *Floating 2
Gakusei-ga booru-o san-nin nage-ta.
student-NOM ball-Acc three-CL throw-PAST
*‘Three students threw a ball/balls.’

Table 4. The pre-test results

<table>
<thead>
<tr>
<th>Sentence type</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-floating 1 (prenominal)</td>
<td>0.72</td>
<td>1.16</td>
</tr>
<tr>
<td>Non-floating 2 (post nominal)</td>
<td>1.16</td>
<td>0.71</td>
</tr>
<tr>
<td>Floating 1</td>
<td>-0.51</td>
<td>0.90</td>
</tr>
<tr>
<td>*Floating 2</td>
<td>-1.51</td>
<td>0.66</td>
</tr>
</tbody>
</table>

Table 4 shows the results of the pre-test. The purpose of the pre-test was to identify and exclude L2ers who were not aware that Japanese allows floating NCs. I had predicted that L2ers without this knowledge would consistently choose +2 for non-floating NCs and -2 for floating NCs. However, no L2er exhibited this behavior, suggesting that they were all aware, at least to some extent, that Japanese allows floating NCs. Consequently, all L2ers tested went on to participate in the main experiment.

5.2.2. Main experiment

In this experiment, a forced-choice preference task was administered to 17 native Chinese speakers studying Japanese, and 32 native Japanese speakers. The task consisted of combinations of a written paragraph that provided either a specific or non-specific context, and a following test sentence, as in (6). The participants were instructed to read the context and complete the following test sentence so that the sentence matched the meaning of the context. In completing the sentence, the participants chose as appropriate one of the two given object NPs, (i) the prenominal NC, and (ii) the floating NC. The participants were instructed to choose both (i) and (ii) when applicable. They were also instructed to choose either (iii) ‘Both options are inappropriate’ or (iv) ‘I don’t know’ when they chose neither (i) nor (ii). All the contexts and the sentences were written in Japanese. Four conditions were created by combinations of the position of NCs (prenominal or floating) and the context (specific or non-specific), and each condition consisted of six tokens.

In the example in (6), the paragraph provides a specific context, in which Professor Yamada is looking for the two students, Mori-kun and Yakeda-san. In order to match the meaning of the following test sentence to the specific
paragraph, the test sentence needs to have the prenominal NC, not the floating NC. Therefore, native Japanese speakers were predicted to choose the option (i) *futa-ri-no* *gakusei-o* ‘two-CL-Gen student-Acc’ (i.e., the prenominal NC), not the floating option (ii) *gakusei-o futa-ri* ‘student-Acc two-CL’ (i.e., the floating NC).

(6) Stimuli Example
Specific context:
Professor Yamada has an appointment to meet two students, Mori-kun and Takeda-san, at 1 p.m. today. It is past 1 p.m., but the two students haven’t shown up. Professor Yamada has gone to the student office to find them.

Test sentence:
Yamada sensei-*w* [  ✔  (i) *futa-ri-no* *gakusei-o* /  ✗  (ii) *gakusei-o futa-ri* ] sagashi-teiru.
Yamada professor-Top [ two-CL-Gen student-Acc / student-Acc two-CL] look for
‘Professor Yamada is looking for two students.’

☐ Both options are inappropriate
☐ I don’t know

The example in (7) provides another example of the stimuli. In contrast to (6), the paragraph in (7) provides a non-specific context, in which Mr. Hara is looking for any two students to help at his shop. The non-specific context is compatible with either prenominal or floating NCs. Therefore, native Japanese speakers were predicted to choose both options, (i) and (ii).

(7) Stimuli Example
Non-specific context:
Mr. Hara is the owner of a coffee shop. Recently, a university moved to his city. As a result, his shop has had more customers and he has become very busy. Therefore, he decided to look for students to help out in his shop and put an advertisement on the door. He wants to hire two students.

Test sentence: same as (6)
Yamada sensei-*w* [  ✔  (i) *futa-ri-no* *gakusei-o* /  ✔  (ii) *gakusei-o futa-ri* ] sagashi-teiru.
Yamada professor-Top [ two-CL-Gen student-Acc / student-Acc two-CL] look for
‘Professor Yamada is looking for two students.’

☐ Both options are inappropriate
☐ I don’t know
6. Results
6.1. Group results

Figure 1 shows the group means of the number of native Japanese speakers choosing prenominal and floating NCs out of the total six tokens in the specific and non-specific context. Regarding the prenominal NCs, the native Japanese group chose the specific interpretation more often than the non-specific interpretation (5.47 vs. 1.59, $t(31)=16.1$, $p<0.01$). In contrast, regarding the floating NCs, the native Japanese group chose the non-specific interpretation more often than the specific interpretation (4.97 vs. 0.91, $t(31)=16.5$, $p<0.01$). These results show that the native Japanese group made a clear distinction between the prenominal NCs and the floating NCs, as Huang and Ochi (2014) suggested.

One unexpected result is that the native Japanese group did not fully choose the non-specific interpretation of prenominal NCs. They only chose it only 1.59 times out of 6, nevertheless, the literature suggests that prenominal NCs allow either specific or non-specific interpretation. The low acceptance of the non-specific interpretation of prenominal NCs could be attributable to the task. In a multiple-choice task, participants tend to choose only one preferred option and overlook other possible options even when they are instructed to choose all possible options. In other words, choosing only one option does not necessarily mean that other options are rejected by the grammar (White, Bruhn-Garavito, Kawasaki, Pater and Prévost 1997).
Figure 2 shows the group means of the number choosing prenominal and floating NCs out of the total six tokens in the specific and non-specific context by the L2 speakers. Regarding the prenominal NCs, the L2 group did not make a distinction between the specific and non-specific interpretation (3.59 vs. 2.77, $t(16)=1.38, p=0.186$). In contrast, they chose the non-specific interpretation more often than the specific interpretation (4.47 vs. 2.77, $t(16)=2.91, p<0.05$).

![Figure 2. Acceptance of each interpretation of prenominal and floating NCs (the L2 group)](image)

### 6.2. Individual results

Section 6.1 reported that the L2 group accepted the non-specific interpretation more often than the specific interpretation of floating NCs. However, the L2 group made a less clear distinction between the two interpretations than the control group. Therefore, this section analyzes how clearly each participant made the distinction between the two interpretations of floating NCs.

Figure 3 presents the individual native Japanese speakers’ responses to the floating NCs. The bars in Figure 3 represent the difference of frequency between choosing the non-specific interpretation and the specific interpretation of floating NCs. In other words, the bars above zero represent that the participant judged that floating NCs have non-specific interpretation more frequently than specific interpretation. The bars that reach six on the vertical axis represent that the participant interpreted floating NCs as non-specific each time and did not interpret floating NCs as specific at all. The horizontal axis presents the 32 native Japanese speakers. Figure 3 shows that 31 out of the total 32 native Japanese speakers accepted the non-specific interpretation more frequently than the specific interpretation of floating NCs.
Figure 3. The difference between the two interpretations of floating NCs (the control group)

Figure 4 presents the difference in acceptance rates between the non-specific interpretation and the specific interpretation of floating NCs by individual L2ers. The horizontal axis presents the 18 L2ers in order of their scores in the Japanese language proficiency test: C1 being the most proficient, and C17 the least proficient. Figure 4 shows that 10 out of the total 17 L2ers (59%) accepted the non-specific interpretation more frequently than the specific interpretation. Statistical analysis shows a relatively strong correlation between the figures and the L2ers’ Japanese language proficiency test scores ($r = 0.68$). In other words, the L2ers successfully made a distinction between the specific and non-specific interpretation as their proficiency increased.

Figure 4. The difference between the two interpretations of floating NCs (the L2 group)
7. Discussion

As presented in Section 4, this study investigates the following two points:

(8) a. Whether the specific/non-specific distinction between prenominal and floating NCs truly holds in the grammar of native Japanese non-linguists.
b. Whether L1 Chinese speakers of L2 Japanese can acquire the specific/non-specific distinction.

Regarding the first point (8a), the native Japanese control group made a distinction between the specific and the non-specific interpretations of floating NCs. The group results suggest that the semantic restriction which disallows the specific interpretation of floating NCs holds true in the grammar of native Japanese non-linguists. This result is in line with Downing (1996) and Huang and Ochi (2014). As for the second point (8b), the group results suggest that the L2ers made a distinction between the specific and the non-specific interpretations. Moreover, the individual results suggest that the L2ers made the distinction as their proficiency increased. This result is also consistent with previous L2 studies on the syntax-semantics interface, including Dekydtspotter, Sprouse, & Swanson (2001), who suggested that advanced L2ers can successfully acquire subtle interpretative differences between syntactic forms in L2.

8. Conclusion

This study investigates L1 Chinese speakers’ acquisition of the specific/non-specific distinction in Japanese NCs. Japanese NCs can appear in either a prenominal or floating position, and the latter are subject to a semantic restriction: The floating NCs only have a non-specific reading, while the prenominal NCs have either a specific or non-specific reading. A forced-choice preference task was administered to native Chinese speakers studying Japanese and native Japanese non-linguists to clarify two points: (i) whether the specific/non-specific distinction between prenominal and floating NCs truly holds in the grammar of native Japanese non-linguists; and (ii) whether L1 Chinese speakers of L2 Japanese can acquire the specific/non-specific distinction that their L1 does not have. The results suggest that (i) the specific/non-specific distinction holds, and (ii) some of the advanced L2ers are indistinguishable from the native Japanese non-linguists in interpreting floating NCs, suggesting that L2ers acquire subtle interpretative differences between different L2 forms.

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