INTERLANGUAGE VARIATION IN THE USE OF THE ENGLISH PLURAL MORPHEME BY JAPANESE ESL SPEAKERS: A COMPARISON WITH CHINESE ESL SPEAKERS

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The present study investigates the influence that developmental, linguistic, and psychosocial factors have on variation in plural "-s" marking by eight adult Japanese learners of English. The study compares the results of Young (1991) that examined the use of the plural morpheme among Chinese learners of English. The data for analysis were collected by tape-recording one-to-one sociolinguistic interview sessions between the researchers and participants. The researchers undertook a multivariate statistical analysis employing the VARBRUL computer program to obtain the results. The results support Young's overall finding that the interlanguage plural marking shows patterned variation constrained by multi-dimensional contextual factors. The VARBRUL analysis has confirmed that measure expressions such as "two years" and "ten dollars" are strong promoters for plural marking. Also, the study suggests that the speakers' L1 background may affect the variation. Finally, the paper provides several pedagogical implications based on the results.

BACKGROUND

Since Selinker (1969) claimed that systematicity exists in the variability of the production of second language learners, second language acquisition (SLA) research has attempted to describe and explain the variation of learners' interlanguage (IL). For example, Stauble (1978) attributed the variation of negation forms to language developmental stages. Beebe and Zuengler (1983) found that phonological variation shown by Thai-Chinese bilingual children was induced by their speech accommodation to the interlocutors' speech. Tarone (1985) attributed interlanguage morphology variation to differing tasks such as narratives, interviews, and written tests. Ellis (1987) indicated that the past tense variation shown by intermediate learners of English from a variety of language backgrounds is affected by whether the production is planned or unplanned.

Whereas these studies examined one-dimensional factors for IL variation, other studies have considered multiple possible factors incorporating Labov's (e.g., 1972) linguistic variation theory. For example, Dickerson (1975) demonstrated that Japanese ESL speakers' variable production of /z/ is influenced by phonetic environment, increasing proficiency, and nature of task. Adamson and Kovac (1981) also examined the influences of multidimensional factors on IL variation. The variable use of "don't" by Alberto, Schumann's (1978) Spanish-speaking participant, showed the influence of syntactic environment, production task, and developmental stage. By performing multivariate analysis using the VARBRUL statistical program developed by Sankoff and Labov (1979) among others, Adamson and Kovac found that in the early developmental stage linguistic environment seemed to play a major role, and in a later stage task began to have a major effect. Young (1991) also analyzed the variation of L1 Chinese speakers' production of the English regular plural morpheme "-s" using the VARBRUL program. He considered ten different contextual factors such as developmental stage, linguistic environment, psychosocial factors, and the factor of communicative redundancy. He demonstrated that: (a) interlanguage shows patterned variation motivated by multidimensional factors regardless of

stage of acquisition, (b) some factors have a stronger impact on variation than others, and (c) factors that contribute to variation change as acquisition proceeds.

The current study undertook a multivariate analysis such as Adamson and Kovac (1981) and Young (1991) carried out. We believe that it is necessary to analyze multidimensional factors to account for IL variation because only this method allows rigorous investigation of the relative causal contributions of multiple factors to IL variation (see Young, 1991, pp. 71-76, for more elaborate discussion on this matter).

Also, the current research almost replicates Young's (1991) study to examine the generalizability of his findings. While Young observed the variation that twelve L1 Chinese speakers demonstrated in their marking of the English plural "-s," we studied eight L1 Japanese speakers to observe their patterns of variation in plural marking.

Research Questions

We asked four research questions, the first three being the same as those of Young (1991).

1. How systematic is the variation of the plural "-s" marking demonstrated by the Japanese participants?
2. How does the variation change as acquisition proceeds?
3. Which contributing factors of the variation of plural marking have a stronger impact than others?
4. Do the variation patterns of the Japanese speakers in this study differ from those of the Chinese speakers in Young's study?

FACTORS

Based on Young's (1991) study we considered four types (dimensions) and eight groups of possible contributing factors, which are specified in Table 1. Redundant plural markers include numerals (e.g., "five" "a hundred"), partitives (e.g., "a lot of" "one of"), quantifiers (e.g., "all" "few" "some"), and plural demonstratives (e.g., "these" "those"). A measure word refers to a word that is used for measuring something. For example, "minute," "hour," "week," "yard," "dollar," and "cups" in "three cups of water" are all regarded as measure words. In the context of plural marking, measure words always accompany redundant plural markers.

HYPOTHESES

The major purpose of the current study is to examine the generalizability of Young's (1991) findings. For this reason the hypotheses of our study are based on Young's research findings. Those hypotheses are described below.

1. Higher proficiency participants favor correct plural marking.
2. The animacy of semantically plural count nouns favors marking for the higher group whereas the inanimacy of semantically plural count nouns favors marking for the lower group.
3. Adverbials and complements favor marking.
4. Vowels preceding the plural morpheme favor marking.
5. Sibilants preceding the plural morpheme disfavor marking.

6. Vowels following the plural morpheme favor marking.

7. Numerals in the plural NP favor marking.

8. Measure words in the plural NP favor marking.

9. When the Japanese participants interact with native English interlocutors (interviewers), they perform better in plural marking than with non-native English interviewers.

10. Variation patterns differ between the higher and lower proficiency groups.

Table 1. Factors Considered for the Plural Marking Variation

Dimension	Factor group	Factor
Developmental	1. ESL proficiency level	Higher
		Lower
Linguistic	2. Animacy/inanimacy of noun to be pluralized	Animate
		Inanimate
	3. Syntactic function of noun to be pluralized	Subject
		Object
		Adverbial
		Complement
	4. Preceding phonological environment of plural-"s" marking	Vowel
		Stop
		Sibilant
		Nasal
		Liquid
	5. Following phonological environment of plural-"s" marking	Vowel
		Consonant
		Pause
Communicative redundancy	6. Redundant plural marker within focused NP	Numeral
		Partitive
		Quantifier
		Plural demonstrative
		No marking
	7. Measure word	Yes
		No
		No
Psychosocial	8. Interlocutor (interviewer)	English native (NS)
		Non-native (NNS)

Hypothesis 1 is based on Young's finding that his high proficiency participants (with TOEFL scores of 470 and above) marked for plural more frequently than his low proficiency participants (with TOEFL scores below 410). Although our participants did not have such a clear-cut difference in TOEFL scores between the higher and lower groups, we attempted to test hypothesis 1 with our participants because our evaluation of the participants' oral proficiencies clearly showed two levels among them.

Hypothesis 2 derives from Young's finding that animate nouns favored plural marking for the high English proficiency group (p-value[1] of .61 for animate and .47 for inanimate), but inanimate nouns favored plural marking for the low English proficiency group (p-value of .36 for animate and .53 for inanimate). The effects of animate and inanimate nouns were canceled out when the two proficiency groups were put together. Young noted that the reason why inanimate nouns can favor marking is the influence of measure words, which always occur with inanimate nouns. In the frequency data he found that measure words were marked in significantly high percentages for both high and low proficiency groups (91% for high, 88% for low). Thus, he

suggested that measure words have a strong influence on marking in general. Young's data suggested that the favoring influence of measure words on plural marking was particularly strong for the low proficiency group because the low proficiency speakers did not frequently mark the plural in general. On the other hand, the effect of measure words decreased for Young's high proficiency speakers because their high frequency plural marking was no longer susceptible to the influence of measure words.

Hypothesis 3 follows Young's finding that when semantically plural count nouns functioned as adverbials or complements in their matrix sentences (e.g., "I work *three days* a week," or "She is *fifteen years* old"), the speakers tended to mark the plural. He suggested that this was again due to the effect of measure words. That is, because measure words, which strongly favor marking, frequently occurred as adverbials or complements, those syntactic functions favored plural marking.

Turning to the phonological environment of plural "-s," we predicted that both preceding and following vowels would favor marking as formulated by hypotheses 4 and 6. These hypotheses stem both from Young's result and the syllable structure of Japanese as the participants' L1. Young showed that both preceding and following vowels of the expected "-s" favored plural marking, and attributed this behavior to the universal tendency of the preference to a CV syllable structure in early second language acquisition (Eckman, 1981). We also derive these hypotheses from our assumption that there may exist a transfer effect from the participants' L1, Japanese, whose canonical syllable structure is CVCV.

Young confirmed that sibilants (i.e., /s/ /z/ /ʃ/ /ʒ/ /ç/ /j/) preceding "-s" disfavored plural marking. He provides the following three reasons: (a) the plural "-s" appears to be already supplied, (b) the long plural, which is pronounced as /əz/ after sibilants, is generally acquired later than the short plurals /s/ or /z/, and (c) lengthening the final /s/ of the stem is an unproductive process both in the participants' first and target languages. Our fifth hypothesis derives from this finding.

Another important finding among Young's results was that numerals favored plural marking (e.g., "She used *three* cups of milk."). He again relates this behavior to the effect of measure words. That is, since measure words frequently accompanied numerals (e.g., "five weeks," "two meters"), and measure words strongly favored plural marking, it turned out that numerals favored plural marking. Based on this finding we constructed hypothesis 7 in our study.

Although Young did not consider the effect of measure words at the beginning of his study, we included measure words as a factor, and formulated hypothesis 8. We predicted that measure words would favor plural marking based on Young's later analysis. Young found the effect of measure words when he analyzed the effects of animacy/inanimacy, syntactic function, and redundant plural marking as noted above. Young's analysis motivated us to consider measure words as a factor, and observe their impact on plural marking relative to other possible contributing factors.

Young initially hypothesized that native English interviewers would facilitate the learners' plural marking compared to non-native English interviewers because of the effect of speech accommodation[2] (i.e., the speaker's convergence to the interlocutor's speech). This hypothesis was disconfirmed. Nevertheless, it is important to consider the psychosocial factor in IL variation as shown in Giles (1977) and Beebe and Zuengler (1983) among others that observe L2 speakers' accommodation behaviors. For this reason we formulated hypothesis 9.

The last hypothesis is based on Young's finding that the pattern of variation shown by his high proficiency learners differed from that of his low proficiency learners in several aspects. For

example, as mentioned, for Young's high proficiency group animacy favored plural marking whereas for the low proficiency group inanimacy favored marking. Also, Young found that plural marking by the low proficiency learners was more influenced by the phonological environment than marking by the high proficiency learners.

DATA

Participants

Eight adult Japanese learners of English voluntarily participated in the study. They were all students who were studying English in an ESL language school at the University of Arizona. Six of them were Japanese university students who were temporarily learning English at the language school. All had studied English in Japan for approximately seven to eight years, and they were all studying for the first time in the U.S. The participants' ages ranged from 19 to 26 years old. Two of the participants were male and six were female. Their TOEFL scores ranged from 407 to 420. The participants' information is summarized in Table 2. The participants were divided into two groups, higher and lower English proficiency. Initially, we planned to rely on their TOEFL scores for grouping. However, their TOEFL scores did not seem to correspond with their oral proficiency levels, where two clear-cut levels of oral proficiency were observed. Eventually, the participants were divided by the researchers' overall judgement of their speech taped for data collection, and by the participants' instructors' holistic assessment of their oral proficiency. The researchers' evaluation coincided with the instructors' assessment. The instructors judged the higher group participants at an intermediate level, and the lower group at a beginning level. The higher group consisted of three participants, and the lower group consisted of five participants.

Table 2. Profiles of Participants

Participant	Gender	TOEFL Score	Proficiency Group	Interviewer
Taro	M	407	Lower	Kato (NNS)
Ai	F	410	Higher	Kato (NNS)
Hanako	F	413	Lower	Uenaka (NNS)
Emi	F	417	Lower	Uenaka (NNS)
Kenta	M	420	Lower	Stauffer (NS)
Nao	F	420	Higher	Stauffer (NS)
Michiko	F	407	Lower	Chu (NNS)
Rikako	F	--	Higher	Chu (NNS)

Note. NNS=non-native speaker of English; NS=native speaker of English. Dash indicates TOEFL score was not obtained.

Data Collection

Data were collected from the end of February through early April in 1995. Each of the four student researchers conducted approximately 10 hours of tape-recorded interviews with two different participants who were randomly assigned to them (see Table 2); that is, we collected about 40 hours of interview data in total. Initially, the interviews were casual conversations to serve as "icebreakers" and to establish a rapport between the interviewer and the participant. Eventually, "the sociolinguistic interview," as described in Labov (1984, pp. 32-42), was implemented and all participants were interviewed for about three hours.

We constructed our version of the sociolinguistic interview question modules that would better function for our participants (see Appendix). For example, we included relatively many

questions regarding comparison between American and Japanese cultural aspects, in addition to the traditional questions such as those regarding "danger of death," family, friends, and school used by Labov (e.g., 1984).

The interview questions were basically memorized by each interviewer to make the interview as natural as possible. The interviews were held in a relaxed atmosphere such as a private study room at the library or in the home of the participant or interviewer. The participants were asked permission to be recorded, and they readily agreed. Although the participants seemed to be aware of being recorded for the first couple of minutes, they seemed to ignore it for most of the interview sessions.

RESULTS AND DISCUSSION

We tabulated tokens of the regular plural morpheme /s/, /z/, /əz/ and obligatory contexts for plural marking. If the participant provided any plural form, the token was counted regardless of whether the correct form was used. Irregular forms of plural such as "children," "men," and "teeth" were not considered. Additionally, nouns ending with /θ/ and /ð/ were not considered due to the difficulty of detecting a following /s/ or /z/. In total we found 1031 tokens.

Each obligatory context for plural marking was coded for: (a) whether marking occurred, and (b) which independent variables (the factors in Table 1) were present. Inter-rater reliability was periodically checked.

Next, we entered the coded tokens into the VARBRUL multivariate statistical program obtaining the results shown in Table 3. Column 1 in Table 3 contains the factors that were hypothesized to constrain the variation in plural marking. For example, for factor group 2, we predicted that the animacy of the plural noun would disfavor marking for lower proficiency participants, but favor marking for higher proficiency participants. Columns 2 and 3, which give the percentage of marking for those groups, show that animacy favors marking in both groups but with an apparent stronger effect for the high proficiency group. Column 5 shows the result of the multivariate analysis in terms of a p-value (p_i). P-values higher than .5 favor marking and p-values lower than .5 disfavor marking. The more extreme the values are, the stronger the effect of the factor. We can see that overall animany favors marking. The results for the other factor groups were as follows.

Factor group 1. Higher proficiency participants favored plural marking.

Factor group 2. Animate nouns favored plural marking (as discussed above).

Factor group 3. Adverbials favored plural marking. Complements strongly disfavored plural marking.

Factor group 4. Preceding stops favored plural marking. Preceding sibilants inhibited plural marking.

In addition to assigning p-values to factors, the VARBRUL program performs a stepwise regression analysis to determine whether each factor group significantly constrains the variation. For this VARBRUL run, factor groups 5 and 6 were found to be not significant. This is discussed below.

Factor group 7. Measure words strongly favored plural marking.

Factor group 8. Native English interlocutors may facilitate plural marking.

Two additional hypotheses were tested: (a) Variation patterns differed for higher and lower proficiencies--however, important differences in the variation patterns between the two

groups as found by Young were not observed; and (b) animacy/inanimacy, complements, and preceding vowels showed different patterns for the Chinese and Japanese participants.

Table 3. Factor Percentages and Probabilities (P-values) for Plural Marking

Factor	% Lower Group	% Higher Group	% Total	P-Value	Significance
1. Proficiency	47 (312/660)	64 (239/371)	53 (551/1031)	Lower .44 Higher .60	$p < .05$
2. Animacy/Inanimacy					
Animate	49 (121/245)	71 (85/120)	56 (206/365)	.62	
Inanimate	46 (191/415)	61 (154/251)	52 (345/666)	.43	$p < .05$
3. Syntactic Function					
Subject	45 (66/147)	58 (29/50)	48 (95/197)	.48	
Object	36 (71/197)	55 (72/132)	43 (143/329)	.47	
Adverb	61 (65/106)	77 (46/60)	67 (111/166)	.56	
Complement	49 (23/47)	54 (19/35)	51 (42/82)	.35	$p < .05$
4. Preceding Phonology					
Vowel	42 (28/67)	63 (24/38)	50 (52/105)	.48	
Stop	55 (127/232)	66 (81/122)	59 (208/354)	.58	
Sibilant	29 (16/56)	42 (11/26)	33 (27/82)	.45	
Nasal	38 (32/85)	53 (28/53)	43 (60/138)	.48	
Liquid	50 (108/215)	73 (95/131)	59 (203/346)	.44	$p < .05$
5. Following Phonology					
Vowel	47 (91/193)	74 (86/116)	57 (177/309)	.51	
Consonant	45 (52/115)	58 (31/53)	49 (83/168)	.45	
Pause	48 (169/352)	60 (122/202)	53 (291/554)	.51	n.s.
6. Redundant Plural Marker					
Numeral	76 (118/155)	82 (100/122)	79 (218/277)	.59 (.76)[b]	
Non-numeral RPM[a]	39 (58/150)	47 (27/57)	41 (85/207)	.47 (.42)[b]	
No Marking	38 (136/355)	58 (112/192)	45 (248/547)	.46 (.39)[b]	n.s.
7. Measure Word					
Yes	89 (101/114)	92 (76/83)	90 (177/197)	.88	
No	39 (211/546)	57 (163/288)	45 (374/834)	.38	$p < .05$
8. Interlocutor					
NS	48 (28/58)	73 (69/95)	63 (97/153)	.62	
NNS	47 (284/602)	62 (170/276)	52 (454/878)	.48	$p < .05$

Note. Input probability (p_0) = .57; Chi-square/cell = 1.238; $N = 1031$.

[a]Non-numeral RPM (Redundant Plural Markers) includes partitives and quantifiers.

[b]P-values in parentheses were obtained when data were analyzed excluding the factor group of measure words.

Table 4. Comparison of the Current Study and Young (1991) for the Results of Plural Marking

Factor	% Lower Group	% Higher Group	% Total	P-Value
1. Proficiency	47 (54)	64 (71)	53 (--)	Low .44 (.32)
				High .60 (.60)
2. Animacy/Inanimacy				
Animate	49 (34)	71 (75)	56 (63)	.62 (.52)
Inanimate	46 (59)	61 (70)	52 (66)	.43 (.49)
3. Syntactic Function				
Subject	45 (35)	58 (65)	48 (55)	.48 (.43)
Object	36 (38)	55 (65)	43 (57)	.47 (.41)
Adverb	61 (81)	77 (79)	67 (80)	.56 (.63)
Complement	49 (57)	54 (79)	51 (71)	.35 (.56)
4. Preceding Phonology				
Vowel[a]	42 (64)	63 (77)	50 (71)	.48 (.53)
Stop	55 (52)	66 (72)	59 (66)	.58 (.53)
Sibilant	29 (31)	42 (63)	33 (54)	.45 (.41)
Nasal	38 (45)	53 (64)	43 (58)	.48 (.46)
Liquid[b]	50 (7)	73 (60)	59 (42)	.44 (.30)
5. Following Phonology				
Vowel	47 (62)	74 (74)	57 (70)	.51 (.56)
Consonant	45 (47)	58 (65)	49 (60)	.45 (.44)
Pause	48 (53)	60 (72)	53 (64)	.51 (.49)
6. Redundant Plural Marker				
Numeral	76 (71)	82 (87)	79 (78)	.76 (.67)
Non-numeral RPM[c]	39 (NA)	47 (NA)	41 (NA)	.42 (NA)
No Marking	38 (36)	58 (64)	45 (57)	.39 (.38)
7. Measure Word				
Yes	89 (--)	92 (--)	90 (--)	.88 (--)
No	39 (--)	57 (--)	45 (--)	.38 (--)
8. Interlocutor				
NS	48 (53)	73 (73)	63 (67)	.62 (.50)
NNS	47 (56)	62 (70)	52 (64)	.48 (.50)

Note. Figures in parentheses are Young's results. Dashes indicate values were not obtained.

[a]Young included both vowels and postvocalic /r/.

[b]Young used laterals.

[c]Non-numeral RDM (Redundant Plural Markers) in Young's study included the following three factors: partitives (.42); quantifiers (.49); pl. demonstratives (.71).

As predicted in hypothesis 1, higher proficiency participants favored plural marking (p_i = .60) whereas lower proficiency participants disfavored marking (p_i = .44). This confirms the logical expectation that plural marking occurs more frequently as overall oral proficiency increases.

Although we predicted in hypothesis 2 that animacy would favor plural marking for higher proficiency participants and inanimacy would favor marking for lower proficiency participants, this was disconfirmed. Animate nouns favored marking more than inanimate nouns for both proficiency groups, unlike Young's finding (see Table 4). The reason why Young's low proficiency participants favored inanimate nouns for plural marking might be that they had much lower proficiency than our lower proficiency particpants. Young's low group consisted of participants with TOEFL scores of 270, 333, 340, 373, 403, and 407, whereas the lowest score for our participants in the lower group was 407. Therefore, the power of measure words, which are all inanimate, might have been only strong enough to affect Young's low proficiency participants' plural marking but not that of our low proficiency participants.

Hypothesis 3, which predicted that adverbials and complements would favor plural marking was only confirmed for adverbials (e.g., "He traveled three *times*.") but not confirmed for complements (e.g., "There are some good *instructor*."). Actually, complements strongly inhibited plural marking (p_i = .35). We assume that in our data measure words appeared as adverbials much more frequently than as complements.

Hypotheses 4 claims that vowels preceding the expected "-s" favor plural marking. This was disconfirmed on the whole (i.e., the higher and lower groups together) pattern (p_i = .48), although the higher group demonstrated 63% of plural marking for preceding vowels. The most important finding in the factor group of preceding phonological environments, though, is that preceding stops were the most facilitating phonological environment (p_i = .58), rather than preceding vowels. Our re-examination of the coded tokens showed that out of 354 stop-ending nouns 272 were ending with /t/ or /d/, and many of them were marked for plural. We postulated with the help of K. Jones, a specialist in Japanese linguistics and Asian languages and cultures at the University of Arizona (personal communication, April 18, 1995), that this could be due to transfer from the speakers' L1. Since the Japanese language contains two phonemes, /ts/ and /dz/, which sound like the final sounds of "studen<u>ts</u>" and "frien<u>ds</u>," and since Japanese does not contain /t/ and /d/ sounds like the final sounds of the singular forms, "studen<u>t</u>," and "frien<u>d</u>," it may be that participants tend to pronounce /ts/ and /dz/ when they encounter /t/ and /d/ regardless of the context for plurality. Two more possible reasons can be considered. The first concerns the effect of word frequency. Since "student(s)," "parent(s)," "minute(s)," and "friend(s)" predominantly appeared among the 272 /t/ or /d/ ending nouns, and since many of them were marked for plural, it can be assumed that these frequently appearing words contributed to plural marking. Secondly, /ts/ and /dz/ may be easy to articulate in general, regardless of the speakers' L1, since the places of articulation for /t/ and /s/, and /d/ and /z/ are homorganic (i.e., the alveolar). Of course, these three kinds of reasons should not be mutually exclusive. Preceding stops should be further analyzed given that Young's participants, as a matter of fact, also favored stops (p_i = .53) as well as vowels (p_i = .53) for plural marking. Young suggests that preceding stops favor plural marking because the place of articulation for /t/, /s/, /d/, and /z/ is the same.

The fifth hypothesis, that sibilants preceding the expected "-s" disfavor plural marking, was confirmed (p_i = .45). Given that this result coincides with Young's, it can be concluded that preceding sibilants are the inhibiting phonological environment for plural "-s" marking in the English interlanguage of Chinese and Japanese speakers.

Although it was predicted by hypothesis 6 that vowels following the expected "-s" would favor plural marking, the factor group of following phonological environments turned out insignificant to variation in plural marking. This result is not as contradictory to Young's result as it may seem. Young's VARBRUL analysis produced the significance value of $p < .02$ for the factor group of following phonological environments in the analysis of all speakers. This is not a good value compared to the significance values of other factor groups in his study. They all provided $p < .001$. Also, Young's VARBRUL analysis indicated the factor group of following phonological environments as not significant when the high and low groups were analyzed separately. Therefore, all together, it can be suggested that the following phonological environment does not significantly constrain variation in plural marking by Japanese and Chinese ESL speakers.

Redundant plural markers in our study only contain numerals, partitives, and quantifiers because demonstratives did not appear in our data. Partitives and quantifiers were collapsed together and labeled as "non-numeral redundant plural makers (non-numeral RPM)" as shown in

Table 3 and Table 4. The initial VARBRUL run showed the factor group of redundant plural markers to be not significant because this factor group and the factor group of measure words are dependent each other. Notice that measure words are always associated with redundant plural markers. Thus, we performed the second run excluding the factor group of measure words. The VARBRUL analysis showed the factor group of redundant plural markers to be significant, and gave p-values for factors (numerals: $p_i = .76$; partitives and quantifiers together: $p_i = .42$; and no redundant plural marking: $p_i = .39$). It is clear that numerals strongly favored plural marking. This coincides with Young's finding. There may be at least two kinds of explanations for this pattern. First, it may be cognitively easy to give the plural marker after numerals; in other words, numerals may structurally trigger the speaker to mark for plural. Second, it can be assumed that because measure words strongly favor plural marking, and measure words frequently accompany numerals, numerals turn out to favor plural marking. Young discusses both the cognitive ease and the effect of measure words as well. The difference, though, is that whereas Young relates the account of cognitive ease to the effect of measure words, we treat the two as separate reasons. We assume that numerals favor plural marking even though the nouns are not measure words. Further analysis is necessary to give a conclusive account for this matter.

As predicted by hypothesis 8, it was confirmed that measure words strongly favor plural marking ($p_i = .88$). This significantly high rate of plural marking may be because measure expressions can be prototypical plural forms learned as a "frozen form" or a "unit," as suggested by Adamson (1988, 1989) and Young (1991).

We tested the hypothesis that native English interlocutors facilitate plural marking as provided in hypothesis 9. The result showed that the factor group was significant, unlike Young's result, and that native English interlocutors facilitated plural marking ($p_i = .62$) while non-native English interlocutors slightly inhibited plural marking ($p_i = .48$). However, since each participant in our study was not interviewed by both native and non-native English speakers for comparison of the two conditions, it may be too immediate to conclude that native speakers facilitate plural marking. In Young's study, each participant did get interviewed by both native and non-native English speakers. However, the problem was that the plural-marking patterns of non-native English interviewers were very close to those of the native English interviewers. Young doubts that this fact affected the result of no accommodation observed. A future study will be necessary to validly uncover whether or not speech accommodation is taking place in the dimension of the IL plural "-s" inflection, solving both our and Young's problems.

Overall, our study did not show major differences in the variation patterns between the higher and lower proficiency groups except for the overall degree/directionality for plural marking (lower group: $p_i = .44$, higher group: $p_i = .60$). This will be because the gap in proficiency between high and low groups in our study was not as extreme as that of Young's.

When the Japanese patterns are compared to the Chinese patterns shown by Young, it was found that animacy/inanimacy, complements, and preceding vowels showed different patterns. For animacy/inanimacy, discussed before, the Japanese group showed that animate nouns favored plural marking more than inanimate nouns for both lower and higher groups, whereas the Chinese group showed this pattern only for the high group. For complements, the Japanese group showed that complements strongly disfavored plural marking ($p_i = .35$), whereas the Chinese group showed that complements favored plural marking ($p_i = .56$). For preceding vowels, although the p-values do not significantly differ, the directionality of percentage for the low(er) group seems significantly different between the Japanese and Chinese groups. In the

lower Japanese group, 42% of nouns containing vowels in their final segments were marked, whereas 64% of those nouns were marked by the lower Chinese group.

CONCLUSION

Overall, the current study corroborated Young's claim that the IL plural "-s" marking shows the patterned variation motivated by multiple-dimensional factors in different degrees regardless of proficiency levels. In our study it turned out that measure words favored plural marking most, and animacy and the proficiency level favored marking to a lesser degree. Compared to these factors, the constraints of phonological environment and syntactic function were relatively weak.

The study has confirmed that measure words are strong plural promoters. It is an empirical question as to whether measure expressions are really acquired in an early stage of second language acquisition because they are prototypical forms for plurals. In addition, we have suggested that animate nouns favor plural marking unless the speaker's ESL proficiency is at such a beginning level as to be susceptible to measure words. If we can identify the acquisition stage in which a sole preference to measure words changes to the dominance of animate nouns for plural marking, this will be an important finding in the processes of second language acquisition.

Another question in relation to measure words is whether numerals favor plural marking because they interact with measure words or because they favor plural marking on their own. This will be identified by re-running VARBRUL with tokens excluding measure words.

The finding that preceding stops favor plural marking is another important issue to consider. It has been found that nouns ending with /t/ or /d/ in particular, tend to be "-s" marked. Three possible reasons have been suggested: (a) the effect of L1 transfer from Japanese phonemes /ts/ and /dz/, (b) the effect of frequently appearing words such as "students" and "friends," which tended to be correctly "-s" marked, and (c) the ease of articulation of /ts/ and /dz/. If the first reason is confirmed, it will be a significant addition to the discussion of L1 phonological transfer in the L2 acquisition of inflectional morphologies, as L. Selinker (personal communication, March 26, 1998) first suggested.

M. Long (personal communication, March 26, 1998) has pointed out the effect of plural nouns used by the interviewers in the interview prompts/questions. For example, some questions regarding family/parents and friends include "parents" and "friends." These words might have stimulated the participants to produce them in the same form. In order to investigate the existence of this effect, we need to re-examine the tokens in relation to the interviewers' use/non-use of "-s" pluralized nouns. Also, it would be better to reformulate or even remove prompts that include "-s" pluralized nouns, in the question modules used for a plural marking study.

Finally, M. Long (personal communication, March 26, 1998) has also claimed that it is important to observe an individual learner's variation in the L2 variation research. Considering that "SLA is characterized by sometimes rather large individual differences [in performance]" (Gass & Selinker, 1994, p. 20), it will surely be important to examine individual learner's variation pattern along with the variation of a group of learners sharing the same L1 background.

PEDAGOGICAL IMPLICATIONS

We believe that the discoveries we have made about variation in plural marking among Japanese speakers of English provide us with some important insights into teaching practice. However, it is essential to note that the goal of this study was not exclusively to find better ways to teach plurals and that, furthermore, the results may not generalize to other ESL learners from different L1 backgrounds. The first pedagogical implication is that plurals should first be taught with measure words. Because plural measure expressions such as "2 days," "30 minutes," and "5 dollars" may be prototypical plural forms, it would be effective to introduce measure expressions first to facilitate the acquisition of plural marking. Adamson (1988) and Young (1991) suggest that "new lexical items and morphological structures appear first in prototypical environments and then generalize to other environments" (Young, 1991, p. 167).

The second implication for teaching plurals stems from the fact that animate nouns are more often marked for plural. Therefore, instructors may want to introduce plurals using animate nouns first, along with measure expressions. Later, inanimate nouns, except for measure expressions, can be gradually introduced.

Perhaps the most important implication for pedagogy to come out of this study is that instructors can benefit from having an awareness of what is occurring in the interlanguage of their students, as Dickerson (1975) claims in regard to her IL variation study. What often appears to be a random application of the plural morpheme is really a logical and systematic use of the plural specific to IL speakers. If ESL instructors are aware of this fact, they will be able to make sound judgements in their instructional practices.

NOTES

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APPENDIX

Sociolinguistic Interview Question Modules (Part)

Close Encounters with Death
1. Did you ever think you were going to get killed or hurt?
    1.1. What happened?
2. Do you know anyone who almost got hurt or killed?
    2.1. What happened?
3. Do you know anyone who was in the earthquake in Japan?
    3.1. What did they tell you about the earthquake?
4. Have you ever been in an earthquake?
    4.1. What did it feel like?
    4.2. What were you thinking about during the earthquake?

Family
1. Do you have any brothers or sisters?
    1.1. Have you ever been mad at you brother/sister?
2. Who is your favorite member of your family?
    2.1. What is the best time you ever had with him/her?
3. What kinds of activities do you do with your family in Japan?
4. Do you want to be like your parents(s) when you become a parent?
    4.1. Why or why not?
5. Do you want to get married in the future?
    5.1. Do you want to have a family?
    5.2. Tell me about your plans.
    5.3. What kind of husband/wife do you want to be?

Friends
1. Who is your best friend?
    1.1. Tell me about him/her.
    1.2. Why do you like him/her?
    1.3. Why dose he or she like you?
    1.4. How did you become best friends?
2. Do you have a boy/girlfriend?
    2.1. Tell me about him/her.
    2.2. How did you meet him/her?
3. Do you have mostly Japanese friends here or American friends?
    3.1. What do you do with your American/Japanese friends in the U.S.?
    3.2. What do you do with your friends in Japan?
    3.3. Do you think friendship is different in America than in Japan?
4. Do you have an American roommate?

4.1. Do you think of your roommate as your friend?
4.2. Have you had any problems with your roommate?
    4.2.1. Tell me about it.

School Questions
1. Who was your best teacher?
    1.1. Tell me about _____.
2. How old were you when you first went to school?
3. Do you remember your first day of school?
    3.1. How did you feel?
4. What was you best class at school?
    4.1. What did you do in this class?
5. Did you ever get into trouble at school?
    5.1. What happened?
6. What is the hardest assignment you've had this year?
    6.1. Tell me about this assignment.
7. Did you play any sports at school?
    7.1. Tell me about it.
8. Did you play on any teams?
    8.1. Did your team ever win a really big game?
    8.2. Tell me about it.
9. Do you like your classes at CESL [participants' language school in Tucson]?
    9.1. Why or why not?
    9.2. Which class do you like best/least?
    9.3. How is CESL different from your school in Japan?

Food
1. What is the best/worst meal you've ever eaten?
2. How is American food different from Japanese food?
    2.1. Which do you like better? Why?
3. Do you cook a lot of food? In Japan? In the U.S.?
4. What is the best dish that you can cook?
5. What is the worst meal that you have ever prepared?
6. Who taught you how to cook?
    6.1. How did you learn?

Advice
1. Did your parents or friends give you any advice before you left Japan?
    1.1. What was the advice?
    1.2. Did you follow it? Why or why not?
2. What was the best advice someone gave you?
3. What was the worst advice someone gave you?