Acquisition and Attrition of *-wa* and *-ga* in Japanese as a Second Language

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1. Introduction

This paper deals with L2 lexical attrition in Japanese as a second language (JSL). It focuses, however, not on open-class, content words, but on a particular class of function words; namely, particles and postpositions in Japanese. More specifically, consideration will first be given to the *acquisition* of different functions of the particles *-wa* and *-ga* in L2 Japanese, including the probable order in which they are acquired. Consideration will then be given to the extent to which accuracy in their use has either been *retained* or *lost* over a period of several years of relative disuse by a group of returnees from Japan who had had nearly two years of immersive, informal acquisition of JSL while in Japan.

The past three decades or so have produced an extensive amount of research into the process of L2 acquisition. One of the general questions of greatest interest, of course, relates to *how* learners acquire second languages. Related to the latter question is that of whether particular features of language are acquired in a natural or predictable order. In both L1 and L2 acquisition, it has been observed that there are natural acquisition orders for certain developmental structures, or at least a general sequence in which they are acquired.

In Japanese as a second language, more and more acquisition-order-related research is being done. Among many others, for instance, Kanagy (1994) has shown that learners tend to acquire the morphology of negative constructions in Japanese in a particular order. Others have begun to study not only acquisition order, but the order in which L2 features are lost. An interesting study published recently by Hansen and Chen (2001), for example, building on Downing's (1996) stages in the acquisition of numeral classifier syntax and their underlying semantic categories in Japanese, finds evidence for an inverse order to that of acquisition in the attrition, or loss, of those forms.

1.1 Acquisition of particles in JSL

In the area of particle acquisition in L2 Japanese, studies by Russell (1985), Sakamoto (1993), Doi and Yoshioka (1990), Yagi (1992), and others have shown that case and focus particles also appear to be acquired in a certain order by JSL learners. Doi and Yoshioka (1990), for example, applied Pienemann and Johnston's (1987) Multidimensional Model to the analysis of the particles *-wa*, *-ga*, and *-o*.[1] Using an oral repetition task and free-style interviews, they found an implicational order in the use of these particles by second-year JSL learners as shown in (1) below:

(1) *-wa* (61.7%) >>>> *-o* (51.4%) >>>> *-ga* (48.3%)
topic — object — subject

Yagi (1992) looked at the written compositions of beginning intermediate students of JSL and found an accuracy order involving several morphemes, including the particles *-wa, -o*, and *-ga*

* I gratefully acknowledge the assistance of Chinami Yamamoto, Keiko M. Barney, and Yuriko Murase for their careful analysis of the data reported upon in this paper.

[1] The particle *-wa* is a discourse-conditioned focus particle, most often associated with the topic or theme of a sentence; *-ga* is the nominative case particle, most often associated with the subject of a sentence; and *-o* is the accusative case particle, most often associated with the direct object of a sentence.

examined by Doi and Yoshioka. According to Yagi's study, the results of which are summarized in (2) below, sentence-final particle *-ga* and subordinate conjunction *-kara* were more accurately produced than the case particle *-ni* and the focus particle *-wa*, which in turn were more accurately produced than the case particle *-ga*. The accuracy of suppliance of the case particle *-no* fell between the first two stages (i.e., between sentence-final particle *-ga* and subordinate conjunction *-kara* on the one hand and case particle *-ni* and focus particle *-wa* on the other), while the accuracy of suppliance of the case particle *-o* fell, in Yagi's study, between the second and third stages (i.e., between case particle *-ni* and focus particle *-wa* on the one hand and case particle *-ga* on the other). With respect to the accuracy order of *–wa* and *–ga*, at least, Yagi's findings appear to support those of Doi and Yoshioka.

(2) Accuracy Order of Various Particles (Yagi, 1992)

-ga (S-final conj.)   *-ni* (case prt.)
         >>>   >>>   ***-ga*** (case prt.)
-kara (S-final conj.)   ***-wa*** (topic prt.)
\   or   /   \   or   /
-no (case prt.)   ***-o*** (case prt.)

The results of both the Yagi and the Doi and Yoshioka studies may, however, be somewhat misleading in that they report accuracy and (by inference) acquisition orders as if the particles were simple, monofunctional forms, ignoring differences in the ease or difficulty of acquisition of different functions of each of the particles in question. Even when different functions are recognized, the reported orders suggest that one particle, in all of its functions, is acquired before the next is acquired.[2] A closer examination of the particles *-wa* and *-ga* will illustrate my point.

Much of the particle acquisition research in Japanese has, in fact, been devoted to the case particle *-ga* and the focus particle *-wa*, often examined in contrast with each other because the subject of a sentence or clause turns out most often to be marked by one or the other. As is well-known since Mikami (1960) and, in particular, Kuno (1972, 1973), these particles (as well as others, for that matter) are functionally complex. In terms of their acquisition, it appears that *-wa* and *-ga* may not at all be acquired as simple units in a fixed order, before or after other particles. Rather, as observed by Russell (1985) and others, certain functional categories of *-wa* and *-ga* seem, consistently, to be acquired before or after others, to the extent, at least, that acquisition order may be inferred from accuracy rates.[3]

For those readers who may be unfamiliar with Japanese or with the functional analysis of *-wa* and *-ga* on which much of this paper is based, let us briefly summarize the relevant linguistic facts. The still more-or-less standard analysis of *-wa* and *-ga*, based substantially on Kuno (1972, 1973), is summarized in (3) and (4) below.

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[2] Although Yagi does discuss errors in the use of *-wa* and *-ga* by functional category, she makes no attempt to order the functions because of insufficient data.

[3] The early, so-called "morpheme studies," many of which were cross-sectional in design (cf., e.g., Dulay and Burt [1974]) essentially equated average accuracy order with acquisition order. Larsen-Freeman (1975) and others, however, have preferred the more conservative term "accuracy order" for the results of cross-sectional studies, reserving the term "acquisition order" for longitudinal studies. While accuracy orders may indeed often be strongly correlated with acquisition orders observed longitudinally, it would be dangerous to equate the two uncritically. Studies reporting accuracy orders based on suppliance of forms in obligatory contexts, for example, have typically failed to account for learners' misuse of forms through overgeneralization or other departures from "target-like use" (cf., e.g., Pica [1983], Larsen-Freeman [1975]).

(3) Functions of Japanese Particle -*wa* (based on Kuno, 1973)

(a) *THEME (TOPIC)*
*Hanako-**wa** gakusei desu*.
'(As for) Hanako, (she) is a student.'

(b) *CONTRAST*
*tenisu-**wa** suki desu ga…*
'(I do) like tennis, but (as for other sports)...'

The focus particle -*wa* has two somewhat closely-related functions, as shown in (3): first, it is used, as in (3a), to mark the *theme* or *topic* (TH) of the discourse and, as such, marks NPs that are either anaphoric, generic, or otherwise assumed to be known to the listener or reader. The use of -*wa* in Japanese often parallels the use of the definite article 'the' in English with common nouns. In the example *Hanako-wa gakusei desu*, *Hanako* is the grammatical subject of the sentence, but is also marked as the topic of the discourse by the particle -*wa*.

The second function of -*wa*, shown in (3b), is to mark NPs that are mentioned in *contrast* (CN) with other NPs. In the example *tenisu-wa suki desu ga*..., the NP *tenisu* is marked with -*wa* instead of the expected case particle -*ga*, suggesting that the speaker *does* like tennis, but does *not* like other sports.

The case particle -*ga* has four different functions, as shown in item (4) below:

(4) Functions of Japanese Particle -*ga* (based on Kuno, 1973)

(a) *SUBJECT, NEUTRAL DESCRIPTION*
*yuki-**ga** hutte-iru.*
'It's snowing (lit., snow is falling).'

(b) *SUBJECT, EXHAUSTIVE LISTING*
*Hanako-**ga** gakusei desu.*
'(It's) Hanako (that) is a student.'

(c) *OBJECT, STATIVE TRANSITIVE VERBAL*
*tenisu-**ga** dekiru.*
'(She) is able (to play) tennis.'

(d) *SUBJECT, SUBORDINATE CLAUSE*[4]
*boku-wa [Hanako-**ga** kaita] tegami-o yonda.*
'I read the letter that Hanako wrote.'

The first function shown is that of *neutral description subject* (ND). In example (4a), *yuki-ga hutte-iru*, 'it's snowing' or, more literally, 'snow is falling', the subject NP, *yuki*, represents information newly introduced to the discourse, and is therefore marked with -*ga*. In story-book sentences of the type, 'Once upon a time, there lived a little old man in a house by the river', the new-information subject, 'a little old man', would be marked with -*ga* in the corresponding Japanese sentence. The use of -*ga* in such sentences closely parallels the use of the indefinite articles 'a' and 'an' in English.

[4] This function of -*ga*, incidentally, was not listed by Kuno as one of its main functions, perhaps because it represents merely a neutralization of the distinction between thematic -*wa*, neutral description -*ga*, and exhaustive listing -*ga* in subordinate clauses (Kuno, 1973:56). It was, nevertheless, included as a separate function of -*ga* in Russell (1985) due to the very fact of its structural limitation to the subordinate clause subject position, recognition of which is crucial to the learner's accurate suppliance of -*ga* in that context, in spite of discourse conditions that might otherwise suggest the appropriateness of -*wa*.

The second function of *-ga* is the highly-marked *exhaustive listing subject* (EL) function. In (4b), *Hanako-ga gakusei desu*, *Hanako* is marked with *-ga* as the one and only person among those under discussion who is a student. *Hanako* represents new, unpredictable information in the discourse, in contrast with the earlier sentence of the same form in which *Hanako* was marked as the known-information *topic* with *-wa*. The *exhaustive listing* sentence, *Hanako-ga gakusei desu*, can be paraphrased as *gakusei na no-wa Hanako desu*, or 'The one who is a student is Hanako', whereas the *topic -wa* sentence of the same structure cannot be paraphrased in the same way.

The third function of *-ga* is that of marking the *object of a stative transitive verbal* (OV). In (4c), *tenisu-ga dekiru*, the understood subject is ellipted, and the object of the stative transitive verb *dekiru* 'to be able' is marked with *-ga*. Other examples of the same type include *Hanako-wa eigo-ga wakaru* 'Hanako understands English', *Tomu-wa okane-ga iru* 'Tom needs money', and so on, where the *-ga*-marked NPs represent the objects of stative transitive verbs.

The fourth function of *-ga* is that of marking the *subject of a subordinate clause* (SC), regardless of whether it has been previously introduced into the discourse or not. In the example sentence in (4d), *Boku-wa [Hanako-ga kaita] tegami-o yonda*, the subject of the relative clause, *Hanako*, is marked with *-ga*.

Based on the functional analysis just described, Russell (1985) examined error patterns in the use of *-wa* and *-ga* by JSL learners with, roughly, intermediate-high to advanced oral proficiency, who had spent approximately two years in Japan acquiring Japanese mostly informally in an immersive, host-culture setting. In a written cloze passage based on *Momotaroo,* a popular Japanese fairy tale, which required the insertion of one of four particles in each of some fifty blanks, the average accuracy order shown in Table (1) below was observed for two separate groups of learners:

Table 1. *Momotaroo*-based written cloze (Russell, 1985); Japan-returnee JSL learners (n=17), intermediate-high to advanced oral proficiency, accuracy orders by function:[5]

Rank	Particle	Function	Mean Accuracy (%)
1	-GA	ND	92.6
2	-WA	TH	84.6
3	-WA	CN	78.8
4	-GA	EL	45.6
5	-GA	SC	32.4

In a second task, the same group of 17 learners were asked to "retell" in writing the story of *Urashimataroo*, another Japanese fairy tale, to which they had been exposed a few days earlier. The accuracy order in Table (2) was observed.

Notice that the second order replicated the first, with the exception of the higher relative accuracy of the *exhaustive listing subject* function of *-ga* in the written task. It was argued that avoidance of the more difficult instances of such marked functions probably accounted for the higher accuracy of the *exhaustive listing* function in the second task.

[5] The object of stative transitive verbal function (OV) was omitted due to insufficient data. In a supplementary, controlled elicitation test, however, accuracy of OV *-ga* ranked highest of all of the six functions tested.

Table 2. *Urashimataroo*-based, story-retelling written essay (Russell, 1985); same learners as in Table (1) above (n=17), accuracy orders by function:[6]

Rank	Particle	Function	Mean Accuracy (%)
1	-GA	ND	92.3
2	-GA	EL	85.7
3	-WA	TH	82.4
4	-WA	CN	70.7
5	-GA	SC	68.4

Sakamoto (1993) reported longitudinal and cross-sectional experiments with different levels of JSL learners both in the U.S. and in Japan, using modified cloze tests based on short dialogues, in which subjects were asked to supply one of four particles (*-wa*, *-ga*, *-o*, or *-ni*, similarly to the earlier Russell study) in different functional positions. While there was some variation, both over time and by proficiency level, the average accuracy order for the subjects that seemed closest in proficiency level to those in the Russell study was as shown in Table (3) below:

Table 3. Modified cloze tests based on short dialogues (Sakamoto, 1993); JSL learners of various levels, from U.S., studying in Japan (results shown below are for learners [advanced, n=11] deemed closest to proficiency level of subjects in Russell [1985]); accuracy orders by function:

Rank	Particle	Function	Mean Accuracy (%)
1T	-GA	OV	90.0
1T	-WA	TH	90.0
3T	-GA	ND	68.0
3T	-WA	CN	68.0
5	-GA	EL	66.0
6	-GA	SC	58.0

Significant differences have thus been observed in accuracy rates for the suppliance of *-wa* and *-ga* in different functions. Abstracting from the results of Russell's and Sakamoto's studies, we find that, contrary to the simple ordering of *-wa* before *-ga* suggested by the studies of Doi and Yoshioka (1990) and others, it appears that, for at least the context-limited production tasks in question, the *object of stative transitive verbal* function of *-ga*, and possibly also the *neutral description subject* function of *-ga*, are more accurately supplied than at least the *contrastive* function of *-wa*. It appears also that at least the *thematic* function of *-wa* is, in turn, consistently more accurately supplied, and probably acquired earlier than, the *exhaustive listing subject* and *subordinate clause subject* functions of *-ga*, which invariably appear to be the most difficult, and probably latest-acquired functions for JSL learners. Based at least on the relatively controlled, written cloze and story-retelling tasks in these studies, then, the following partial orderings of the functions of *-wa* and *-ga* shown in item (5) below seem rather robust:

(5) {OV-*ga*, TH-*wa*, ND-*ga*} >>> {CN-*wa*, EL-*ga*, SC-*ga*}

EL-*ga* >>> SC-*ga*

The fact, incidentally, that the *subordinate clause subject*-marking function of the particle *-ga* appears to be acquired so late would be entirely consistent with the observation, based on Pienemann's Processability Theory and its precursors, that features of language that require processing from or within embedded structures or across subordinate clause boundaries, in general, occur late in the acquisition process. (Pienemann, 1998; Clahsen, 1984; Pienemann and Johnston, 1987) It is probably

[6] OV *-ga* was again omitted, this time for purposes of comparison with the results of the earlier task, shown in Table 1.

also not accidental that all three of the functions in the latter stage (CN-*wa*, EL-*ga*, and SC-*ga*) are highly marked in at least one way or another.

1.2 L1 acquisition of -wa and -ga in Japanese

It is also interesting to note the results of experiments with respect to the *L1* acquisition of -*wa* and -*ga* by Japanese children. In a study of 90 subjects ranging from ages 4 through 14, and based on a picture-cued, elicited production task, Tahara and Ito (1985) found, for example, that "[s]ubjects at the age of 4 and 5 used only 'ga' regardless of context." Subjects from 6 through 12 years of age "began to use 'wa' for the referent which appeared in the previous context" [i.e. *thematic -wa*], though not consistently. "Fourteen-year-old subjects and adults systematically differentiated 'wa' and 'ga' according to the discourse function." But while 'wa' and 'ga' do appear in the two-utterance stage, it appears "that the complete acquisition of these two particles is very late." (p. 208) Hatano (1979) also found "that [the] appearance of *ga* in children's language was antecedent to that of *wa* and correct usage of *wa* was possible only after preschool age." (p. 168) Along with the well-known study by Hakuta (1982), in which L1-Japanese children between the ages of 2 and 6 are shown to have begun the acquisition of -*ga* in conjunction with canonical (for Japanese) SOV word order position at a very early stage, these results suggest that, in at least some of its functions, the case particle -*ga* may be acquired earlier than the *topic* (or *thematic*) particle -*wa*, not only in L2 acquisition, but in L1 acquisition as well.[7]

2. The current study

2.1 Research questions

In the balance of this paper we will examine the extent to which learners of L2 Japanese retain or lose proficiency in the use of particles in Japanese, especially of -*wa* and -*ga*, over a 12-year period of relative disuse of the language. We will also address the question of the order, if any, in which the subjects of this study appear to have acquired, and then subsequently begun to lose, proficiency in the functions of -*wa* and -*ga* described above. Finally, we will examine factors accounting for variation in the extent to which proficiency in the functions of -*wa* and -*ga* is retained or lost (for example, the role of formal instruction as a factor in delaying loss, the role of avoidance and other task-related effects on accuracy orders, and so on).

2.2 Subjects

As part of a larger project directed by C. Ray Graham of Brigham Young University and funded in part by the Center for Applied Linguistics in Washington, D.C., an initial group of 80 returned missionaries from Japan were randomly selected to participate in a series of three tests that were administered over a two-year period following their return from Japan, where they had all lived for nearly two years, acquiring Japanese as a second language in an informal, immersion setting. A fourth administration of the same tests was conducted at about 10 years following the third test.

The subjects were grouped according to whether they had received little or no formal instruction following their return (the No-Formal-Instruction Group) or eight-or-more credit hours of formal instruction following their return (the Formal-Instruction Group). Initially, 10 subjects were selected at random from each of the two groups. All had undergone similar initial acquisition experiences, in both quality and length of time. Because of attrition, however, in the number of subjects from the initial group of 20 to only eight of the same subjects who were available for the 10-year follow-up study, the data were insufficient for a complete analysis of -*wa* and -*ga* according to functional

[7] While Pienemann's Processability Theory, like its precursor, the Multidimensional Model, has been advanced primarily to explain L2 acquisition, Pienemann appears to believe that, in combination with other theoretical constructs and constraints, it will also be found to be predictive of L1 developmental orders (Pienemann, 1998:308 ff.). If so, studies showing the early acquisition of -*ga* (relative to -*wa*) in L1 Japanese may turn out to be problematic for that theory.

categories. So the sample size for the *-wa*/*-ga* analysis was expanded to include as many of the 10-year follow-up subjects as possible. We ended up with 21 subjects, 14 without formal instruction after return and seven with formal instruction. A summary profile of the subjects and the timing of the tests is shown in Appendix A. The data on which this study is based consist of oral monologue speech elicited in four-minute responses to each of three different questions, as shown in Appendix B.

2.3 Previous, related studies

Before discussing the results of the analysis of *-wa* and *-ga* in the data elicited from our subjects, I will give a brief overview of some of the results that have come from earlier lexical and syntactic analyses of the data.

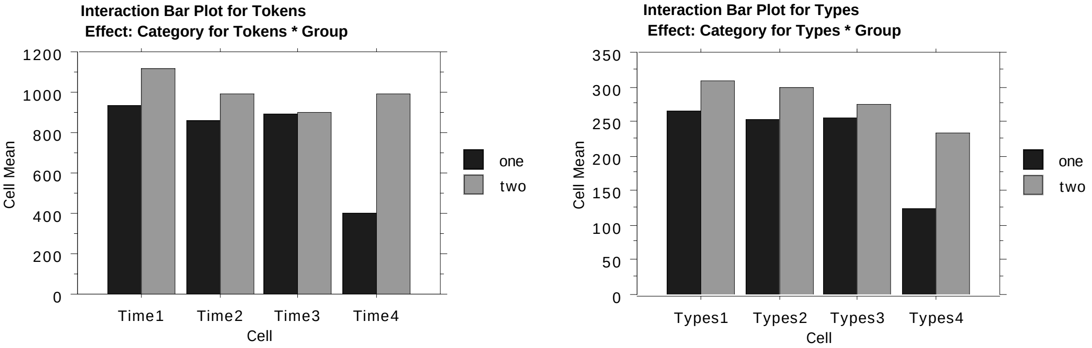
In a broad lexical study (Russell, 1995, 1999a), for instance, we examined a number of different variables related to changes in productive lexical ability, including total vocabulary size, lexical variety, lexical density, lexical accuracy, and code-switching and -mixing. Of the more than 20 variables tested,[8] significant changes over the initial two-year period of observation were found in only three general areas: (1) there was a significant decrease in vocabulary size, measured in tokens [F=4.89, p<.01], types [F=3.59, p<.04], content tokens [F=8.28, p<.001], and content types [F=3.73, p<.03]; (2) there was also a significant decrease in the number of T-units [F=19.522, p<.0003], in the number of T-units that contained no lexical errors [F=5.13, p<.04], and in the number of tokens per error-free T-unit [F=6.02, p<.02]; and (3) there was a significant increase in the number of English tokens relative to total tokens [F=4.05, p<.03]. There was thus some minimal evidence of lexical attrition, but perhaps not as much as might have been expected when compared, at least, with earlier studies of learners from a foreign-language classroom setting.

For the eight (out of the initial subset of 20) subjects who participated in the 10-year follow-up study (Russell, 2000),[9] there was a significant decline in vocabulary size, as measured in both tokens (F=8.07, p=.0013) and types (F=15.71, p<.0001). The means are shown in Table (4) and the corresponding bar plots in Figure (1) below.

Table 4. Vocabulary Size; by Group over Time; Mean Tokens and Types:

Variable	Group	N	Time 1	Time 2	Time 3	Time 4
Tokens	One	4	937.5	861.5	893.8	396.3
	Two	4	1119.0	993.5	902.8	990.0
Types	One	4	263.8	252.8	256.3	122.8
	Two	4	309.3	298.5	274.3	234.0

Figure 1. Bar Plots; Vocabulary Size; by Group over Time; Mean Tokens and Types



[8] Significance values are based on Two-Way Analysis of Variance (ANOVA) with Repeated Measures, with a comparison of the two groups of subjects (with and without formal instruction) over three levels of time.

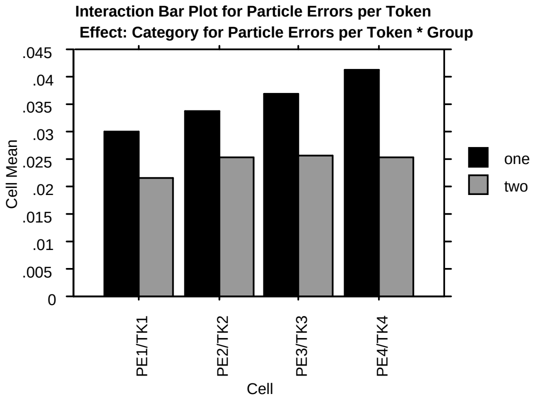
Unlike the measurements at the end of only two years, however, which showed no effect for group, the most recent measurement shows a difference between the two groups in vocabulary size, significant in the case of tokens (F=6.568, p=.003) and approaching significance in types (F=2.518, p=.091). As can be seen again in Table (4) and the bar plots in Figure (1), Group 1 subjects (*without* significant formal instruction) showed a steep decline in the number of both tokens and types in the 10 years since the previous test, while the subjects of Group 2 (*with* formal instruction during the initial two years of observation) declined much less noticeably in types and actually increased slightly in tokens.

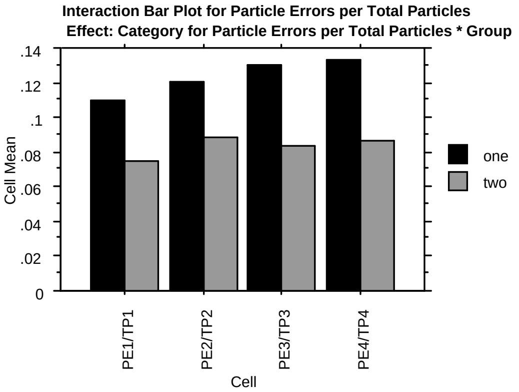
With regard to the accuracy of use of case and focus particles in general (*-ga*, *-o*, *-ni*, *-de*, *-wa*, *-mo*, etc.), we see a steady increase (as seen in Table (5) and Figure (2)) from Test 1 through Test 4 in the number of particle errors adjusted for total tokens and as a percentage of total tokens used, for Group 1, as opposed to virtually no increase in particle error rates for Group 2. The difference, however, was not significant, due probably to the small number of subjects and the degree of individual variability among them.

Table 5. Particle Accuracy; by Group over Time; Mean Adjusted Particle Errors (all, n.s.)

Variable	Group	N	Time 1	Time 2	Time 3	Time 4
Prt. Err's/Tokens	One	4	.030	.034	.037	.041
	Two	4	.021	.025	.025	.025
Prt. Err's/Tot. Prt's.	One	4	.109	.120	.131	.133
	Two	4	.074	.089	.084	.087

Figure 2. Bar Plots; Particle Accuracy; by Group over Time; Mean Adjusted Particle Errors (all n.s.):





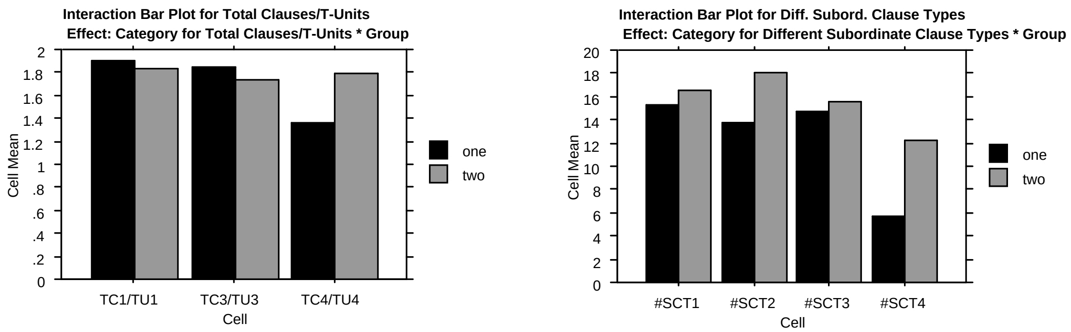
There was, however, a significant difference between groups over time in both syntactic complexity and variety, as shown in Table (6) and Figure (3); i.e., in both total-clauses-per-T-Unit (a measure of syntactic complexity, F=5.86, p=.017) and the number of different subordinate clause types used (syntactic variety, F=3.34, p=.043). As can be seen graphically below, the group with follow-up formal instruction fared much better in terms of retention, even as long as 10 years following their last significant exposure to the language through formal instruction.

[9] The research reported in Russell (2000) was a 10-year follow-up study of changes in syntactic competence in a subset of the same subjects reported in Russell (1999b).

Table 6. Syntactic Complexity, Variety; by Group over Time; Total Clauses/T-Unit, # of Different Subordinate Clause Types:

Variable	Group	N	Time 1	Time 2	Time 3	Time 4
Tot. Cl's./T-Unit	One	4	1.9	n.a.	1.8	1.4
	Two	4	1.8	n.a.	1.7	1.8
# Diff. S.C. Types	One	4	15.3	13.8	14.8	5.8
	Two	4	16.5	18.0	15.5	12.3

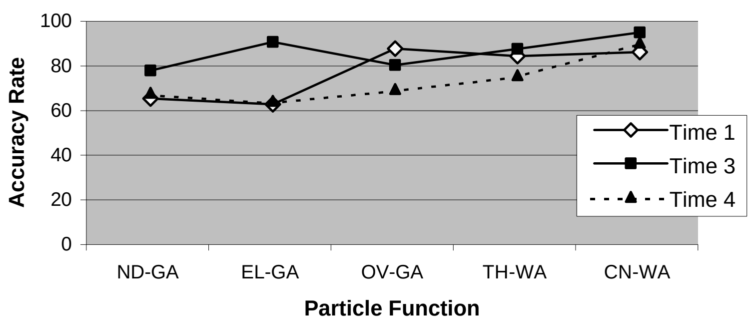
Figure 3. Bar Plots; Syntactic Complexity, Variety; by Group over Time; Total Clauses/T-Unit, # of Different Subordinate Clause Types:



2.4 *Results of -wa and -ga analysis*

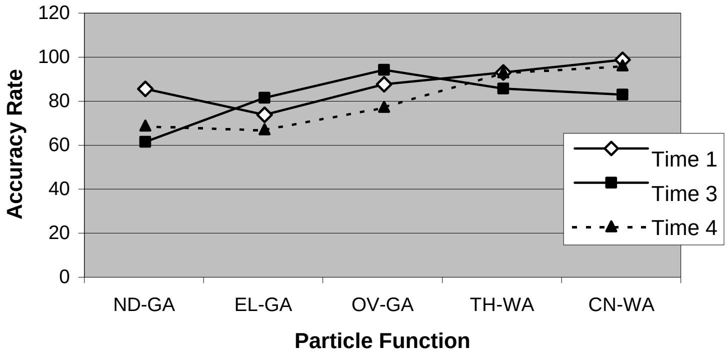
Let us now return to the expanded group of 21 subjects and the analysis of *-wa* and *-ga*. In the figures below are displayed the mean accuracy rates in the use of *-wa* and *-ga*, by function, over Times 1, 3, and 4: for Group 1 (without formal instruction) in Figure (4), and for Group 2 in Figure (5).

Figure 4. Group 1; *-wa*/*-ga* Accuracy x Function over Time:



	ND-GA	EL-GA	OV-GA	TH-WA	CN-WA
Time 1	64.4	61.7	86.7	83.3	85.2
Time 3	76.9	89.6	79.3	86.5	93.9
Time 4	66.9	63.3	68.6	74.8	89.4

Figure 5. Group 2; *-wa*/*-ga* Accuracy x Function over Time:

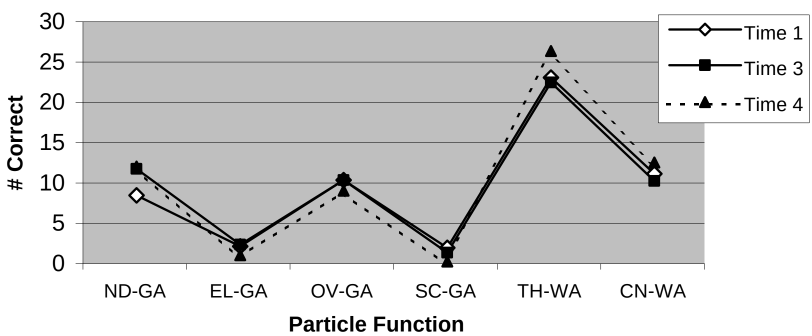


	ND-GA	EL-GA	OV-GA	TH-WA	CN-WA
Time 1	80.7	68.9	82.8	88.2	93.9
Time 3	56.6	76.7	89.4	80.9	78.1
Time 4	68.4	66.7	76.9	92.6	95.8

Notice the absence of means for the *subordinate clause subject* function of *-ga*. There were too few occurrences of this function over time to allow valid means to be calculated; by Time 4, for example, none of the 14 Group 1 subjects supplied even a single instance of *subordinate clause subject -ga*, while four of the seven Group 2 subjects supplied a total of only 13 instances.

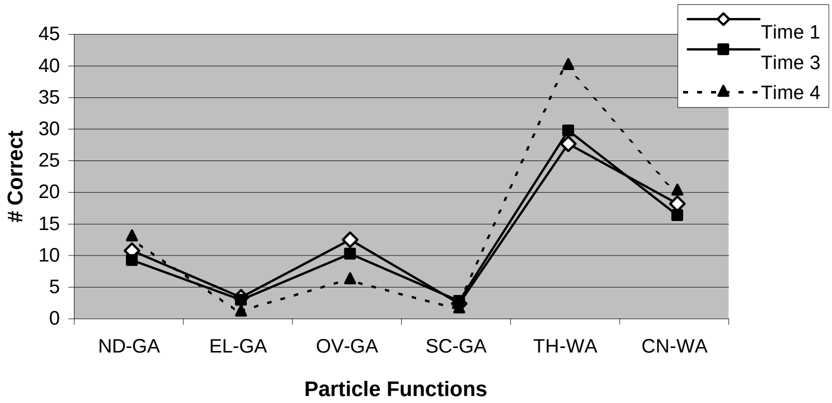
In order to give some sense of the changes in *subordinate clause subject -ga* over time, I have also plotted mean correct uses, by function, per 1,000 tokens, as shown below for Group 1 in Figure (6) and for Group 2 in Figure (7). There actually does appear, incidentally, to be a moderately strong correlation between the two, according to a regression analysis in which the mean correct uses ratio for each function was shown to predict the corresponding accuracy rate, even for *subordinate clause subject -ga*: {ND-*ga*, R=.375, F=9.963, p=.0025}, {EL-*ga*, R=.483, F=13.105, p=.0008}, {OV-*ga*, R=.494, F=19.702, p<.0001}, {SC-*ga*, R=.517, F=9.124, p=.0057}, {TH-*wa*, R=.517, F=22.208, p<.0001}, {CN-*wa*, R=.484, F=18.706, P<.0001}.

Figure 6. Group 1; # of Correct Function Uses per 1,000 Tokens over Time:



	ND-GA	EL-GA	OV-GA	SC-GA	TH-WA	CN-WA
Time 1	8.1	1.8	10.0	1.6	22.7	10.8
Time 3	11.4	2.0	10.0	1.0	22.1	9.9
Time 4	11.8	0.8	8.8	0.0	26.1	12.3

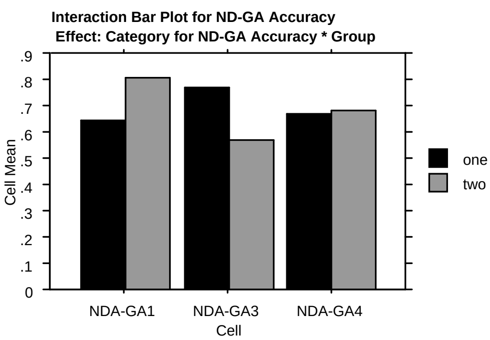
Figure 7. Group 2; # of Correct Function Uses per 1,000 Tokens over Time:



	ND-GA	EL-GA	OV-GA	SC-GA	TH-WA	CN-WA
Time 1	8.8	1.4	10.5	0.4	25.7	16.2
Time 3	7.3	1.0	8.3	0.8	27.8	14.4
Time 4	13.0	1.1	6.2	1.6	40.1	20.2

Although several differences in group, time, or function approached statistical significance, very few actually reached that level due, in part at least, to the small sample size relative to the number of variables and to considerable variability among subjects.[10] Only five dependent variables reached significance, as shown in the bar plots in Figures (8)-(12) below.

Figure 8. ND-*ga* Accuracy Rate (Group x Time, F=3.156, p=.05)



[10] Data were analyzed using both Two-Way Anova with Repeated Measures and the Mixed Procedure with Covariance Parameter Estimates.

Figure 9. TH-*wa* Accuracy Rate (Group x Time, F=3.491, p=.04)

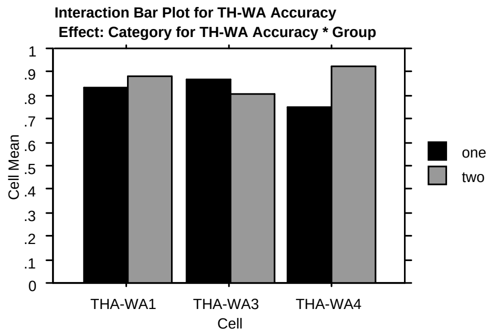


Figure 10. SC-*ga* Correct Uses/Token Ratio (Group x Time, F=5.145, p=.01)

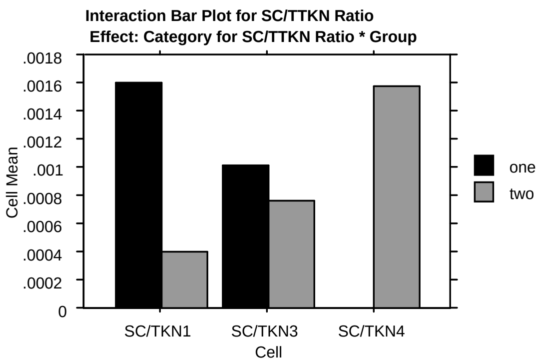


Figure 11. TH-*wa* Correct Uses/Token Ratio (Time, F=4.093, p=.025)

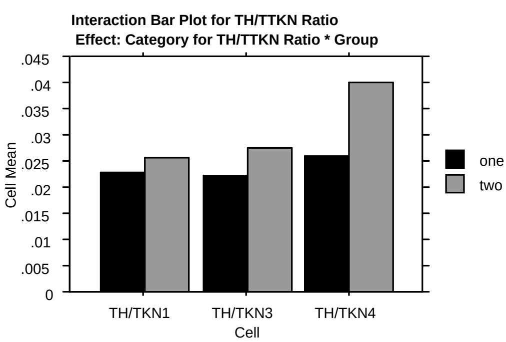
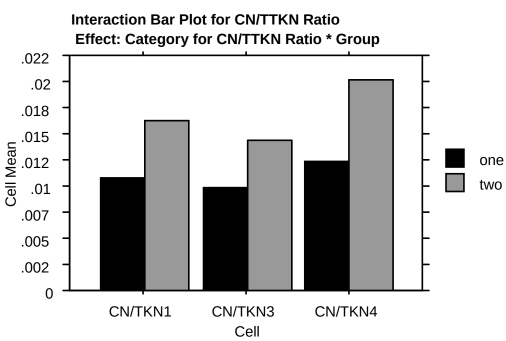


Figure 12. CN-*wa* Correct Uses/Token Ratio (Group, F=5.230, p=.034)



There was a significant difference between Groups 1 and 2, over time, in the accuracy rates of ND-*ga* (cf. Figure (8) above) and of TH-*wa* (cf. Figure (9)). There was also a significant difference, over time, between Groups 1 and 2 in the ratio of correct uses of SC-*ga* per token (cf. Figure 10), and significant differences in the token-adjusted ratios of correct usage of TH-*wa*, over time, but not between groups (cf. Figure (11)), and of CN-*wa*, between groups, but not over time (cf. Figure (12)).

3. Discussion

Let us, in conclusion, briefly discuss the implications of the findings presented above. First, it is interesting to observe that, at least with respect to the accuracy of particle usage in general, and of -*wa* and -*ga* in particular, there was little or no statistically significant evidence of attrition (with the few exceptions noted in Figures (8)-(12)); certainly less than one might have expected for such a long period of relative disuse (10 to 12 years), and compared with the results of a number of studies of formal learners over shorter periods of time. This result accords generally, however, with earlier studies based on data elicited from the same group of subjects, and is discussed in more detail in Russell (1999a, 1999b, and 2004). Briefly, though, a number of possible explanations come readily to mind, including the following: (1) the nature of the learners and the acquisition setting; (2) the level of initial proficiency before the onset of attrition; (3) the effects of avoidance inherent in the relatively free-form, oral production task on which this analysis is based, which allows subjects to "avoid" the use of features not confidently under their control; (4) the possibility that function words or grammatical features, especially those of high frequency, once acquired, are more resistant to loss than content words in the lexicon; and finally, (5) the possibility that the features in question had not yet been fully acquired, and are therefore less likely to show significant levels of attrition. It is likely, in fact, that all of the above factors contribute to the impression of less-than-expected attrition.

There are, however, a number of areas in which statistically significant changes have been observed, including changes in vocabulary size, syntactic complexity, and syntactic variety. In all three areas, there were significant differences between the two groups of subjects (with and without follow-up formal instruction) over the 12-year period, with the formal-instruction group suffering significantly less attrition than the non-formal-instruction group. That is not to say, necessarily, that follow-up formal instruction has a causal effect in slowing attrition, although it may indeed turn out to be one such factor. The possibility must also be considered that other variables (such as motivation, aptitude, prior levels of achievement, and the like) confound the picture by influencing learners to pursue further formal instruction in the language in the first place, a possibility that receives support from the fact that there appear to be at least some pre-existing differences between the two groups that are maintained over time, as discussed in Russell (1999a).

With regard specifically to -*wa* and -*ga*, the only two significant changes in accuracy rates occurred with *neutral description -ga* (Figure (8)) and *thematic -wa* (Figure (9)). In both cases, Group 2 (the formal-instruction group) actually increased in accuracy in the 10 years between Test 3 and Test 4, while Group 1 declined in accuracy.[11] Another striking difference between the two groups occurred in the increase in the relative number of SC-*ga* particles accurately supplied by Group 2, the formal-instruction group, compared with a decline to zero correct uses of SC-*ga* at Time 4 by all 14 Group 1 subjects. This result is no doubt related to parallel changes in syntactic complexity and variety between the two groups over time, as mentioned above. There was, finally, an increase overall in the relative number of correct suppliances of both TH-*wa* and CN-*wa*, with a significantly higher increase for Group 2 in the case of CN-*wa*. This result may also be connected with the increase, over time, in the frequency of syntactically simpler, topic-comment structures, together with the trend toward fewer subordinate clause and other more highly marked structures in which SC-*ga* and EL-*ga* might be expected to occur.

[11] An interesting pattern, for which I have no good explanation at this time, is the quadratic behavior exhibited in the form of increases or decreases in accuracy between Test 1 and Test 3, with trends reversing themselves and stabilizing by Test 4, 10 years later, as seen, for example, in the accuracy rates for ND-*ga*.

The results of this study are rather interesting with respect to accuracy or acquisition orders, to the extent that they may be inferred from the data in Figures (4)-(7). The results may be summarized as in Table (7) below:

Table 7. Summary of Accuracy Orders for -*wa*/-*ga* by Function:[12]

	Group 1 / Time 1	Group 1 / Time 4	Group 2 / Time 1	Group 2 / Time 4
(1)	OV-*ga* (86.7)	CN-*wa* (89.4)	CN-*wa* (93.9)	CN-*wa* (95.8)
(2)	CN-*wa* (85.2)	TH-*wa* (74.8)	TH-*wa* (88.2)	TH-*wa* (92.6)
(3)	TH-*wa* (83.3)	OV-*ga* (68.6)	OV-*ga* (82.8)	OV-*ga* (76.9)
(4)	ND-*ga* (64.4)	ND-*ga* (66.9)	ND-*ga* (80.7)	ND-*ga* (68.4)
(5)	EL-*ga* (61.7)	EL-*ga* (63.3)	EL-*ga* (68.9)	SC-*ga* (n.a.)
(6)	SC-*ga* (n.a.)	SC-*ga* (n.a.)	SC-*ga* (n.a.)	EL-*ga* (66.7)

With the exception of Group 1, Time 1, where OV-*ga* was the most accurately supplied function, the accuracy order at every other point from Time 1 until 12 years later at Time 4 was nearly identical: CN-*wa* > TH-*wa* > OV-*ga* > ND-*ga* > {EL-*ga*, SC-*ga*}. Bear in mind that this order still lacks solid statistical support, which may yet come from increased sample sizes and more sophisticated multivariate analyses, but it does seem reasonable, given what we know about both the linguistic and usage facts. Assuming, for the moment, that this is a valid order or sequence, it is interesting to note that it fits somewhat more closely the implicational scaling results of Doi and Yoshioka (1990) based on predictions from the Multidimensional Model than it does the orders reported by Russell (1985) and Sakamoto (1993). At least one reason for this result seems obvious: namely, task variability. The task on which the current orders are based, relatively free oral production, is much closer to the free-style interview data on which the Doi and Yoshioka results were based, in part, and very different from the controlled cloze tasks on which the earlier Russell and Sakamoto results were largely based.

The variance in orders also raises the whole question of what it means to "acquire" (and then, subsequently) to "lose" a feature of language, a much larger question for another occasion. It is interesting, though, to note that, if one takes one of the criteria of acquisition to be 80%-or-higher suppliance of a form in obligatory contexts, as has often been done in studies of this sort, the EL-*ga* and SC-*ga* functions, and perhaps even the ND-*ga* function, probably never were fully acquired by the subjects in this study prior to the onset of attrition, and that only CN-*wa* and TH-*wa* for Group 2 and only CN-*wa* for Group 1 remained at a level higher than 80% after 12 years, with OV-*ga* and possibly ND-*ga* falling below the threshold over that time.

Another interesting finding suggested by the data in Table (7) is the order in which the functions of -*wa* and -*ga* appear to be deteriorating. With the notable exception of OV-*ga* in Group 1, changes between Times 1 and 4 suggest that the functions acquired most recently (if 80% accuracy is assumed to be the criterion for acquisition) tend clearly to be the first ones lost, as generally predicted by the regression hypothesis (due originally to Jakobson [1968]), according to which developmental features of language are predicted to be lost in the reverse order to that in which they were acquired -- a sort of last-in, first-out model of attrition.[13] It will be interesting to examine further the possible validity of this finding.

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[12] Ranking of SC-*ga* was inferred from weighted frequency ranking of functions correctly used (cf. Figures (6) and (7)), with which accuracy orders were moderately well-correlated. Dotted lines indicate 80% accuracy criterion for acquisition.

[13] See de Bot and Weltens (1991) for a discussion of the regression hypothesis.

4. Conclusion

In conclusion, it is probably safe to assume that accuracy rates alone are insufficient to explain either orders of acquisition or of attrition, especially when they are based on relatively free oral production tasks in which the likelihood of avoidance is high, especially for features of low frequency or high difficulty. It is clear, for example, that all of the subjects in this study, especially those of Group 1, increasingly avoided the use of EL-*ga* and SC-*ga*, the former perhaps because of the difficulty of the function and certainly because of the low probability of its frequency in the given task, and the latter, certainly both because of its difficulty and its lower potential frequency associated with the decline in the number of subordinate clauses overall suggested by data like those in Table (6) and Figure (3) above.

What is needed to make better sense of acquisition and attrition orders, in general, is a more comprehensive model that triangulates among different kinds of tasks, avoiding the avoidance and frequency-related problems of natural production tasks and at the same time the frequent artificiality of elicitation tasks that prevent subjects from avoiding the targeted structures. It is my hope that the modest findings of this study will motivate further research not only into orders of acquisition and attrition of particles in Japanese, but into acquisition and attrition orders in general.

Appendix A

BYU Language Attrition Project, Profile of Subjects (Japanese):

	Pre-MTC	MTC	Japan	U.S.	Test 1	Test 2	Test 3	Test 4
Time Line		2 mos.	22 mos.	0-4 yrs.	1986	1987	1988	1998
Tot. # Ss					80	>>>	65.....	27
Exposure to Spoken Japanese	little / none	semi-intensive	informal, immersive	limited/ none	>>>	>>>	>>>	>>>
Grp 1 Ss / Formal Instruction				(same Ss, 0-1 class)	n=14 / none	n=14 / none	n=14 / none	n=14 / none
Grp 2 Ss / Formal Instruction				(same Ss, 2+ classes	n=7 / some	n=7 / some	n=7 / some	n=7 / none

“MTC” = Missionary Training Center

Appendix B

Data currently being analyzed: Oral monologue JSL speech elicited in the form of four-minute timed responses to each of three questions asking subjects (1) to talk about education, career, family and other plans over the next five to 10 years, (2) to give a self-introduction to an imaginary group of fellow students giving them name, home location, a little about family, school, and work experiences, hobbies and interests, etc., and (3) to talk about differences between American and Japanese culture and society (work, food, housing, holidays, the economy, sports, etc.) with a Japanese person they have met in the airplane on their return trip to the U.S.

References

Clahsen, Harald. 1984. "The acquisition of German word order: A test case for cognitive approaches to L2 development," in Roger Andersen, ed., *Second Language: A Cross-linguistic Perspective*, 219-242. Newbury House: Rowley, MA.

de Bot, Kees and Bert Weltens. 1991. "Recapitulation, regression, and language loss," in Herbert Seliger and Robert Vago, eds., *First Language Attrition*, 31-52. Cambridge: Cambridge University Press.

de Bot, Kees and Bert Weltens. 1995. "Foreign Language Attrition," in William Grabe, ed., *Annual Review of Applied Linguistics*, 15, 151-164. Cambridge: Cambridge University Press.

Doi, Toshiyuki and Kaoru Yoshioka. 1990. "Speech processing constraints on the acquisition of Japanese particles: Applying the Pienemann-Johnston model to Japanese as a second language," in T. Hayes and Kaoru Yoshioka, eds., *Proceedings of the 1st Conference on Second Language Acquisition and Teaching*, 1, 23-33. Niigata, Japan: Language Programs of the International University of Japan.

Downing, Pamela. 1996. *Numeral Classifier Systems: The Case of Japanese*. Amsterdam: John Benjamins Publishing Co.

Dulay, Heidi and Marina Burt. 1974. "Natural sequences in child second language acquisition." *Language Learning* 24, 37-53.

Ellis, Rod. 1994. *The Study of Second Language Acquisition*. Oxford: Oxford University Press.

Hakuta, Kenji. 1982. "Interaction between particles and word order in the comprehension and production of simple sentences in Japanese children." *Developmental Psychology* 18(1), 62-76.

Hansen, Lynne and Yung-Lin Chen. 2001. "What counts in the acquisition and attrition of numeral classifiers?" *JALT Journal* 23(1), 90-110.

Hatano, Etsuko. 1979. "Kodomo ni okeru zyosi 'wa' 'ga' no kakutoku no kenkyuu" [A study of children's acquisition of particles *wa* and *ga* in Japanese]. *The Japanese Journal of Educational Psychology* 27(3), 160-168.

Jakobson, Roman. 1968. *Child Language, Aphasia Phonological Universals*. (A. R. Keiler, trans.). The Hague: Mouton. (Original work published 1941)

Kanagy, Ruth. 1994. "Developmental sequences in learning Japanese: A look at negation." *Issues in Applied Linguistics* 5(2), 255-277.

Kuno, Susumu. 1972. "Functional sentence perspective: A case study from Japanese and English." *Linguistic Inquiry* 3, 269-320.

Kuno, Susumu. 1973. *The Structure of the Japanese Language*. Cambridge: The M.I.T. Press.

Larsen-Freeman, Diane. 1975. "The acquisition of grammatical morphemes by adult ESL students." *TESOL Quarterly* 9, 409-430.

Mikami, Akira. 1960. *Zoo wa Hana ga Nagai* [Elephants Have Long Noses]. Tokyo: Kuroshio Shuppan.

Pica, Teresa. 1983. "Adult acquisition of English as a second language under different conditions of exposure." *Language Learning* 33, 465-497.

Pienemann, Manfred. 1998. *Language Processing and Second Language Development: Processability Theory* (Studies in Bilingualism, Vol. 15). Amsterdam: John Benjamins Publishing Co.

Pienemann, Manfred and Malcolm Johnston. 1987. "Factors influencing the development of language proficiency," in David Nunan, ed., *Applying Second Language Acquisition Research,* 45-141. Adelaide: National Curriculum Resource Centre, Adult Migrant Education Program.

Russell, Robert. 1985. "An analysis of student errors in the use of Japanese -WA and -GA." *Papers in Linguistics* 18, 197-221.

Russell, Robert. 1995. "Measuring changes in productive L2 Japanese lexical competence," paper presented at AAAL '95 (Annual Meeting of the Association of Applied Linguistics), Long Beach, CA.

Russell, Robert. 1999a. "Lexical maintenance and attrition in Japanese as a second language," in Lynne Hansen, ed., *Second Language Attrition in Japanese Contexts*, 114-141. Oxford: Oxford University Press.

Russell, Robert. 1999b. "Measuring attrition in L2 Japanese syntactic competence," in Peter Robinson, ed., *Representation and Process: Proceedings of the 3rd Pacific Second Language Research Forum, Vol. 1,* 297-307. Tokyo: The Pacific Second Language Research Forum.

Russell, Robert. 2000. "Attrition in English native speakers' L2 production of Japanese: 10 years later," paper presented in Dorit Kaufman, chair, Language attrition: Crosslinguistic interplay and sociolinguistic perspectives, at SLRF (Second Language Research Forum) 2000, University of Wisconsin, Madison, WI.

Russell, Robert. 2004. "Fluency-related variables in the loss of L2 Japanese skills," in Satoru Koyama, Kanoko Otomo, and Miwako Nohara, eds., *Gengo to Kyooiku: Nihongo o Taisyoo tosite* [Language and Education: Focusing on Japanese]. Tokyo: Kuroshio Shuppan.

Sakamoto, Tadashi. 1993. "On acquisition order: Japanese particles WA and GA," in *Proceedings of the 4th Conference on Second Language Research in Japan*, 105-122. Niigata, Japan: Language Programs of the International University of Japan.

Tahara, Shunji and Takehiko Ito. 1985. "Zyosi wa to ga no danwa kinoo no hattatu" [The development of discourse function in Japanese particles 'wa' and 'ga']. *The Japanese Journal of Psychology* 56(4), 208-214.

Weltens, Bert and Theo van Els. 1986. "The attrition of French as a foreign language: Interim results," in Bert Weltens, Kees de Bot, and Theo van Els, eds., *Language Attrition in Progress*, 205-221. Dordrecht: Foris Publications.

Yagi, Kimiko. 1992. "The accuracy order of Japanese particles." *Sekai no Nihongo Kyooiku* [Japanese Language Education Around the Globe] 2, 15-25.

ISB4: Proceedings of the 4th International Symposium on Bilingualism

edited by James Cohen, Kara T. McAlister, Kellie Rolstad, and Jeff MacSwan

Cascadilla Press Somerville, MA 2005

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ISBN 978-1-57473-210-8 CD-ROM
ISBN 978-1-57473-107-1 library binding (5-volume set)

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