INPUT VS. OUTPUT PRACTICE IN EDUCATIONAL SOFTWARE FOR SECOND LANGUAGE ACQUISITION

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ABSTRACT

This paper presents an experiment concerning the relative effectiveness of computer assisted comprehension practice and production practice in the acquisition of a second language. Two computer programs were developed: (a) an input-focused program providing students with explicit grammatical instruction and comprehension exercises and (b) an output-focused program providing the same grammatical instruction together with production exercises. The results of the study show that the output-focused group performed significantly better than the input-focused group for the production of Japanese honorifics and equally well for the comprehension of these structures. The study supports Swain's argument that there are roles for output in second language acquisition that are independent of comprehensible input.

INTRODUCTION

There is increasing interest in the use of computer-assisted language instruction, for obvious reasons. The extensive exercises and drills required in second language instruction place significant demands on class time, and students must wait for feedback on their exercises until the instructor corrects them. Computer-assisted language instruction, in conjunction with contemporary natural language processing technology, holds out the promise of unlimited, immediate feedback pinpointed to the specific grammatical errors made by the student (Nagata, 1993, 1995, 1996, 1997b). But, even though it is technologically feasible for a computer to provide individualized grammatical feedback, there remains an important empirical question about how the exercises should be formatted to optimize their instructional effectiveness in promoting different sorts of competence for different types of target structures. Several such studies have been performed.

Doughty (1991) compares three kinds of computerized instruction, in which all subjects were presented the same reading texts on the computer, but the rule-oriented instructional group received explanations of the grammatical rules in relative-clause constructions, the meaning-oriented instructional group was encouraged to focus on both the content and structure, and the control group was merely exposed to the reading texts. While both the rule-oriented instructional group and the meaning-oriented instructional group improved equally well in relativization ability and significantly better than the control group, the meaning-oriented instructional group performed best in comprehending the reading texts.

N. Ellis (1993) performed a computerized experiment to compare the effectiveness of explicit (Rule), structured (Rule & Instances), and implicit (Random) programs to teach the soft mutation construction in Welsh. The Rule group and the Rule & Instances group received instruction in grammatical rules, but only the Rule & Instances group was shown how each rule applied to two instances of vocabulary. Afterward, all three groups were presented Welsh phrases on the computer screen and were asked to type in the appropriate English translation for each phrase. The Rule & Instances group performed best on well-formedness judgments and the Random group performed worst.

DeKeyser's study (1995) employed a computer program to compare explicit-deductive instruction with implicit-inductive instruction. Both the explicit-deductive group and the implicit-inductive group were

presented pictures with corresponding sentences in Implexan (a miniature linguistic system) on the computer, but only the explicit-deductive group was provided explanations on Implexan grammatical rules. The grammatical rules included two types: straightforward ("categorical") rules and fuzzy rules ("prototypicality patterns" that cannot be completely reduced to an abstract rule). On the final production test, the explicit-deductive subjects performed significantly better than the implicit-inductive subjects for the straightforward rules, while no such advantage was observed in the fuzzy rules[1].

Robinson's study (1996) employed computerized instruction to teach both simple and complex structures of English, under several conditions. All subjects were presented the same target sentences on the computer, but, for example, the rule-instructed subjects were asked metalinguistic questions regarding the sentences, the rule-search subjects were asked if they identified any rule in the given sentences, and the implicit subjects were instructed to memorize the target sentences. The rule-instructed subjects performed significantly better than the rule-search subjects and the implicit subjects for the simple structure on the grammaticality judgment test. The rule-instructed subjects also outperformed the other groups for the complex structure although the difference was statistically significant only between the rule-instructed subjects and the rule-search subjects.

Nagata's study (1997a) employed a computer program providing fill-in-the-blank exercises to practice Japanese particles. Two types of feedback were implemented: metalinguistic feedback (explaining metalinguistic rules in response to particle errors) and English translations (providing English equivalents to the Japanese particles). The results of the study suggest that ongoing metalinguistic feedback is more effective than first-language translation feedback in producing the Japanese particles.

This paper presents a new study investigating the relative effectiveness of production (output) exercises and comprehension (input) exercises presented and graded by personal computers. Although the target structures are Japanese honorifics, the results should interest anyone concerned with computer-assisted language instruction (CALI) and the role of input and output practice in second language acquisition.

THE STUDY

Theoretical Background

Many studies have investigated the role of input in second language acquisition (e.g., Ellis, R., 1981; Faerch & Kasper, 1986; Gass & Madden, 1985; Krashen, 1980, 1985, 1987; Loschky, 1994; Sharwood Smith, 1993; White, 1987). It seems that the role of output has received less attention. According to Krashen (1987), "comprehensible input"[2] and the affective state are the true causes of language acquisition. On this hypothesis, production exercises would be relevant to language acquisition only insofar as they lower affective barriers or provide additional comprehensible input. VanPatten and Cadierno (1993a, 1993b) examined the effects of two types of instruction, traditional instruction and processing instruction, in both interpreting and producing Spanish object pronouns in OVS and OV order. The traditional instruction involved grammatical explanations and output practice, while the processing instruction involved grammatical explanations and comprehension practice. These two kinds of instruction were also different in the grammatical information provided[3] and the instructional approach adopted.[4] The result of their study indicates that the processing group performed significantly better than the traditional group on comprehension post-tests and equally well on production post-tests. VanPatten and Cadierno conclude that "instruction is apparently more beneficial when it is directed at how learners perceive and process input rather than when instruction is focused on practice via output," (1993a, p. 54; 1993b, p. 240).[5]

Swain (1985, p. 248), however, argues that "there are roles for output in second language acquisition that are independent of comprehensible input," (see also Swain and Lapkin, 1995). The results of her study (1985) indicate that sixth-grade French immersion students perform similarly to native speakers on those aspects of discourse and sociolinguistic competence which do not rely heavily on grammar for their

realization but their grammatical performance is not equivalent to that of native speakers (p. 251). The immersion students in her study received enough comprehensible input, but their "comprehensible output"[6] was very limited. Swain conjectures that producing the language, as opposed to simply comprehending the language, may force the learner to move from semantic processing to syntactic processing, thereby facilitating more grammatical competence. Swain also refers to the phenomenon of individuals who can understand a language and yet can only produce limited utterances in it: a ninth-grade immersion student said, "I understand everything anyone says to me, and I can hear in my head how I should sound when I talk, but it never comes out that way," (p. 248). This indicates that comprehension does not necessarily transfer to production.

DeKeyser and Sokalski (1996) replicated Van Patten and Cadierno's study using two different target structures: the Spanish direct object clitics (the same structure used in Van Patten and Cadierno's study) and the Spanish conditional, which is more complex and difficult to produce. DeKeyser and Sokalski's study eliminated extra variables by providing the same grammatical instruction and exercise content, so the comparison was entirely between comprehension practice and production practice. The results of the immediate post-test show that for object clitics, the input practice group performed better in the comprehension tasks and the output practice group performed better in the production tasks. For the conditional, the output practice group outperformed the input practice group in both the production and the comprehension tasks. These differences faded in the long term, however. The results indicate that "the relative effectiveness of production versus comprehension practice depends on the morphosyntactic complexity of the structure in question as well as on the delay between practice and testing" (DeKeyser and Sokalski 1996).

The present study investigates the relative effectiveness of comprehension and production practice in the acquisition of Japanese honorifics, both formally and conceptually complex structures of Japanese.[7] The following describes the Japanese honorific system briefly.

The Japanese Honorific System

Japanese honorifics (*keigo*) have traditionally been sub-classified into respectful words (*sonkeigo*) and humble words (*kenzyoogo*).[8] The use of honorifics depends on the notions of "out-group" and "in-group." The distinctions between "out-group" and "in-group" may be understood in terms of differences in rank, age, affiliation, intimacy, and so forth. Typically, the "out-group" includes the speaker's superiors (e.g., teachers, supervisors, etc.) and the "in-group" includes the speaker and the speaker's family members or subordinates (e.g., assistants, secretaries, etc.). Japanese honorifics are used in both spoken and written contexts. There are irregular and regular honorific verbal forms. The regular, respectful form of a verb is constructed using the fixed pattern "*o* + verb stem + *ni narimasu.*"[9] This form is used when an out-group person is the subject who performs the action in a sentence (e.g., *Sensee ga kono hon o o-kaki-ni-narimasita* (respectful), 'My teacher wrote this book'). The regular, humble form of a verb is arrived at using the pattern "*o* + verb stem + *simasu.*" This form is used, for example, when the speaker or the speaker's in-group member is the subject who performs the action in a sentence and an out-group person is the object/direction/goal of the action (e.g., *Sensee ni o-ai-simasu* (humble), 'I will meet my teacher'). The irregular honorific forms are not arrived at by these patterns and must be memorized for each verb (e.g., *Sensee ga irassyaimasu* (respectful), 'My teacher will come'; *Watasi ga mairimasu* (humble), 'I will come').

In short, a speaker needs to choose honorific forms depending on who the subject of the sentence is, on who the object of the sentence is, on whom the speaker is talking to, and so forth.[10] Verbs may take regular honorific forms, irregular honorific forms, or both regular and irregular honorific forms. Japanese honorifics are fairly complicated structures which represent a major hurdle for second-language learners of Japanese.

Subjects

Fourteen students in a second-semester Japanese course at the University of San Francisco participated in this study. The students were paired based on the scores they obtained on the mid-term exam and were randomly divided into two groups,[11] so that the two groups had no significant difference in the level of achievement in the course, prior to the experiment (t = 1.07, p = 0.324).[12] Each group consisted of three males and four females. The students' first language was English, except for one student in the input-focused group whose first language was Korean but who was also fluent in English.[13]

Materials

Two computer programs were developed in HyperCard (these programs are called **BANZAI: HONORIFICS**). One is an input-focused program which provides explicit grammatical instruction together with comprehension exercises and the other is an output-focused program which provides the same grammatical instruction augmented by production exercises. Macintosh computers were used in this experiment. The target structures, Japanese honorifics, were new to the students. Four lessons of grammar notes and exercises were implemented in both programs.[14] The grammar note includes grammatical/conceptual descriptions of the Japanese honorific system accompanied by examples. The exercises include five types of tasks, in order to develop the learners' comprehension or production skills through word-level, sentence-level, and paragraph-level practice. Appendices A, B, C, D, and E describe the five types of comprehension and production exercises respectively.

Figure 1 illustrates one of the type 3 comprehension exercises, as presented on the computer screen. Every exercise in the input-focused program provides the students with a choice of three answers .[15] Suppose a student clicks #1 or #2 to answer the question in Figure 1 (the input-focused program). He/she is informed that "O-KAKI-NI-NARIMASITA is a respectful form, so the subject who performs the action in the sentence should be an out-group member (e.g., superior)."[16] (Capitalized Japanese words are presented on the computer screen in the Japanese kana and kanji writing systems). If #3 is selected, the student is informed that the answer is correct and a Japanese pronunciation of the correct answer is provided.

Figure 1: An exercise in the input-focused program

(1) Select an English equivalent to the following sentence.

1. **You:** 先生がお書きになりました。
   1. You are telling your friend that you wrote it for your teacher.
   2. You are telling your teacher that your friend wrote it.
   3. You are telling your colleague that your teacher wrote it.

Click a box for the correct answer.
☐ 1   ☐ 2   ☐ 3

[Vocabulary Hint]   [Grammar]

Figure 2 illustrates one of the type 3 production exercises as it appears on the computer screen. The output-focused program involves the same sentence used in the input-focused program, but the exercise is to "produce" the sentence. For example, the student is asked to type a sentence in the box at the bottom of the screen and push the "Check Answer" button to check whether or not his/her response is correct. The program uses a Japanese word processor so that the students can type their responses in the Japanese writing system.[17] The correct answer for this question is something like *Sensee ga o-kaki-ni-narimasita,* 'My teacher wrote it.' If the student types *Sensee ga o-kaki-simasita,* he/she is informed that "O-KAKI-SIMASITA is a humble form, but the subject who performs the action in the sentence is an out-group member (e.g., superior). Use a respectful form."[18] If the student in the output-focused group fails to provide a correct response three times, an "Answer" button appears. Pressing the "Answer" button provides the student with the correct answer. If the student types a correct response, he/she is informed that the answer is correct and a Japanese pronunciation of the correct answer is provided. In short, both the input-focused program and the output-focused program provide the same content of exercises with on-going grammatical feedback in response to the learners' correct and incorrect answers. Both programs also provide a "Grammar" button to open the grammar note which the students read at the beginning of the session and a "Vocabulary Hint" button to see the list of words used in each exercise.

Figure 2: An exercise in the output-focused program

(1) What would you say in Japanese if you were in the following situation.
Use honorifics if the situation is appropriate.

1. **Your colleague saw Japanese calligraphy on the wall and exclaimed on how pretty it is. Tell her that your teacher wrote it.**

| Check Answer | Vocabulary Hint | Grammar |

A pilot study was conducted with two third-semester Japanese students. The result of the pilot study indicated that comprehension exercises require less time for the students to complete than the production exercises. In order to equalize the total instructional time for both groups, the input-focused program provided more exercises than the output-focused program.[19] Through four computer sessions (approximately one hour per session), the students in both groups received 137 exercises.[20] In addition, the input-focused group received 130 more exercises.[21]

Procedure

The students in both groups participated in four one-hour computer sessions over the course of two weeks: one group received the input-focused program and the other received the output-focused program.[22] In each computer session, the input-focused group spent five to seven minutes reading a grammar note (i.e., a short text describing the grammatical structures on the computer), and then

proceeded to the comprehension exercises. The output-focused group also first spent five to seven minutes reading the same grammar note, and then moved to the production exercises.

A questionnaire was administered at the end of the last computer session. On the questionnaire, the students were asked to rate 23 items on a 5-point scale (1 strongly disagree, 2 disagree, 3 undecided, 4 agree, and 5 strongly agree) and to write comments about the computer program.

Two days after the last computer session, the students took an achievement test in their usual classroom. The achievement test included both comprehension and production tasks similar to the ones provided in the computer sessions. The comprehension tasks consisted of a total of 21 questions (in which 4 questions were of exercise type 1, 4 questions of type 2, 7 questions of type 3, 2 questions of type 4, and 4 questions of type 5). The production tasks consisted of a total of 20 questions (in which 9 questions were of type 2, 7 questions of type 3, 2 questions of type 4, and 2 questions of type 5).[23] The achievement test was not conducted on the computer because only the output-focused group used the Japanese word processor and it was suspected that if the production tasks were performed on the computer, the input-focused group might have difficulty in typing Japanese on the Japanese word processor. It was also optional whether to use Japanese or roman characters to write the answers. A perfect score on the comprehension tasks was 42 and that on the production tasks was 43. The following scoring system was used for the achievement test. For the comprehension tasks, 2.0 points were deducted for any incorrect choice. For the production tasks, points were deducted according to the relative importance of errors in the given questions. For example, 1.0 points were deducted for an incorrect or missing verb (although when the error was on the verbal forms such as using humble for respect, plain for honorific, perfective for imperfective, or negative for affirmative, only 0.5 points were deducted), and 0.5 points were deducted for other incorrect or missing words/particles and for incorrect word order. A spelling mistake also resulted in a 0.2 point reduction. The students' scores were converted into percentages.

After the students took the achievement test, they were away from class for one week during the university's spring break period. The students in both groups were asked to write a one-page letter about what they did during the break to the teacher using honorific forms. After they submitted the homework, the homework was corrected and returned to them. A week after the spring break, the students were assigned another one-page written assignment to translate English conversations to Japanese. The conversations were between a teacher and a student, so to translate them use of appropriate honorific forms was required. In the following class, the students practiced oral conversations on the basis of this homework for about thirty minutes. During the rest of the course, no more special activity was provided regarding honorifics.

A month after the computer sessions, the students took a retention test. The retention test consists of comprehension tasks (4 questions of exercise type 1, 3 questions of type 2, and 5 questions of type 3) and production tasks (7 questions of type 3) which were all provided on the achievement test. Fewer questions were given on the retention test than on the achievement test because the retention test was administered together with the written final exam, so space was limited. The retention test focused on sentence-level comprehension and production tasks. The perfect score on both the comprehension tasks and the production tasks was 24. The retention test followed the same scoring system used in the achievement test. The students' scores were converted into percentages.

A week after the retention test (i.e., five weeks after the computer sessions), the students took an oral conversation test involving Japanese honorifics. In the oral conversation test, each student performed conversations together with the instructor and the tutor of the Japanese course for about 5 minutes. The students were asked ten questions such as whether they came to school yesterday, what they did, whether they met their friends or teacher, what the teacher did, etc. The conversation was recorded and graded based on ten sentences that the students were supposed to produce using honorifics. A perfect score on the

oral test was 14. The oral test followed the same scoring system used for production tasks on the achievement test. The students' scores were converted into percentages.

ANALYSIS

The two-sample dependent t-test (the paired two-sample t-test) was applied to examine whether there is a significant difference between the input-focused group and the output-focused group in their scores on the achievement test, the retention test, and the oral test. All statistical analysis in this study employed two-tailed t-tests.

RESULTS AND DISCUSSION

Table 1 shows the means and standard deviations of the two groups for the comprehension tasks and the production tasks on the achievement test, and the results of the corresponding t-tests. The results of the achievement test show that there is no significant difference between the two groups in the comprehension tasks, while the difference between the two groups in the production tasks is statistically significant at the 0.002 level, favoring the output-focused group. The results suggest that given the same grammatical instruction, output-focused practice is more effective than input-focused practice for the development of skill in producing Japanese honorifics and is equally effective for the comprehension of these structures.

Table 1: The results of the comprehension tasks and the production tasks on the achievement test (scores out of 100)

Achievement test	Input group		Output group		T-test	
	Mean	SD	Mean	SD	t	Sig of t
Comprehension tasks	92.4	9.0	95.2	3.8	1.15	NS
Production tasks	72.3	16.1	85.4	13.4	5.67	0.002

Figure 3 presents the means of the two groups for each type of comprehension tasks (type 1 through type 5) on the achievement test. The scores for each type of comprehension task were converted into percentages. The result shows that there is no significant difference between the two groups for each type of comprehension task.

Figure 3: The result of each type of comprehension task on the achievement test (scores out of 100)
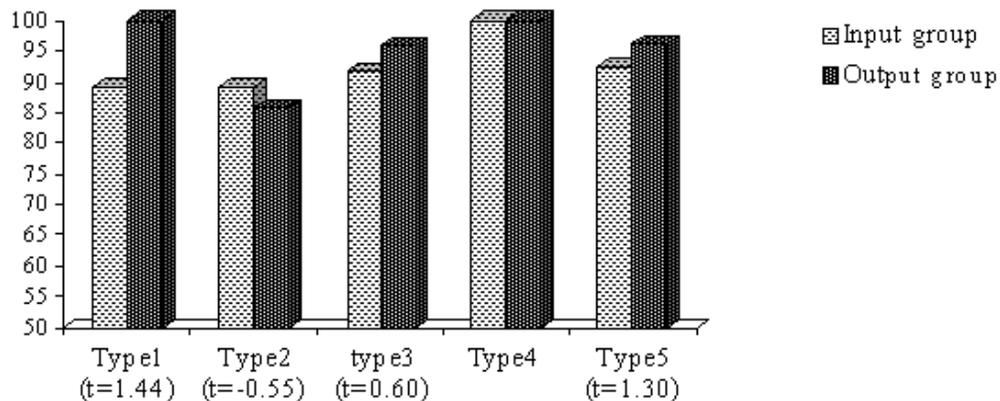

Figure 4 presents the means of the two groups for each type of production task (type 2 through 5) on the achievement test. (As noted, type 1 tasks were omitted, due to time considerations and their similarity to type 2 tasks.) The scores for each type of production task were converted into percentages. A significant

difference was found in types 3 and 4 (p < 0.001 for type 3 and p < 0.05 for type 4), but not in types 2 and 5. Type 2 production tasks asked the students to fill in the blank with a verbal predicate (as illustrated in example (4) in Appendix B). This type of question involves only production of a verb form, while type 3 production tasks require full-sentence production (see example (6) in Appendix C). Therefore, type 3 production tasks involve more complex syntactic processing than type 2 tasks. Type 4 production tasks are also more complex than type 2 tasks because they require the students to read the text and to revise verbs with appropriate honorific forms when necessary (see example (8) in Appendix D). In this type of task, the learners need to understand discourse context and to recover some unstated subjects and objects from context in order to determine appropriate honorific forms. The results suggest that when more complex syntactic and discourse processing is involved in production tasks, it becomes more difficult for learners to apply their learning from comprehension exercises directly to the production tasks. Type 5 is a semi-production task because the students were presented a few Japanese sentences orally and were asked to dictate them, which is different from constructing sentences by themselves. For this task, an oral cue was provided three times for each sentence, and the students were given enough time to write down each sentence. Since the nature of the task was half receptive, this might be one reason the input-focused group performed as well as the output-focused group in type 5 production tasks.

Figure 4: The result of each type of production task on the achievement test (scores out of 100)
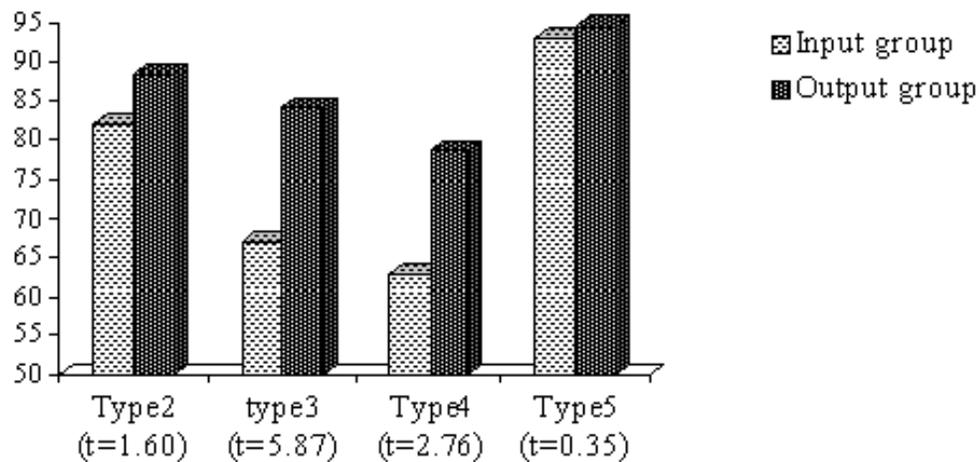
The retention test results (Table 2) are consistent with the achievement test results: there is no significant difference between the two groups in the comprehension tasks, while the difference between the two groups in the production tasks is statistically significant at the 0.02 level, favoring the output-focused group.[24] The result of the oral conversation test (Table 3) also exhibits a statistically significant difference, favoring the output-focused group (p < 0.02).[25] These results indicate that given the same follow-up written assignments and oral conversation practice, output-focused practice is more effective than input-focused practice in the long term in both written and oral production of Japanese honorific sentences.

Table 2: The results of the comprehension tasks and the production tasks on the retention test (scores out of 100)

Retention test	Input group		Output group		T-test	
	Mean	*SD*	Mean	*SD*	*t*	Sig of t
Comprehension tasks	88.1	11.6	96.4	4.5	1.62	NS
Production tasks	74.4	15.9	84.8	16.2	3.18	0.02

Table 3: The result of the oral conversation test (scores out of 100)

Oral conversation test	Input group		Output group		T-test	
	Mean	*SD*	Mean	*SD*	*t*	Sig of t
Oral production	68.8	19.3	83.2	11.0	3.29	0.02

Table 4 presents the means and standard deviations of the ratings for each item on the questionnaire (1 strongly disagree, 2 disagree, 3 undecided, 4 agree, and 5 strongly agree). The result of the questionnaire shows that both groups had very positive attitudes toward the computer program, regardless of whether they received the input-focused program or the output-focused program. The ratings for items 3, 9, 18, 19, 20, and 21 show some differences between the two groups, although the differences are not statistically significant.[26] The reason item 3 ("I didn't have technical problems when working on the program,") was rated 0.9 lower by the output-focused group might be related to the fact that the output-focused group used the Japanese word processor and the students often hit the wrong keys to edit their responses (e.g., to go forward or backward in the text, delete a character, convert kana to kanji, etc.). The output-focused group also rated item 9 ("The processing of feedback is fast enough.") 1.3 lower than the input-focused group did. This is reflected by the fact that the output-focused program took a much longer time to return feedback than the input-focused program, especially for type 3 of exercises (i.e., sentence production exercises) because the output-focused program involved a more complex analysis of the student's response. On the other hand, item 18 ("The CALI exercises help me practice Japanese by myself.") and item 21 ("I want to practice Japanese using this type of CALI exercise on a regular basis.") were rated 0.8 higher by the output-focused group than by the input-focused group, and item 19 ("I find the CALI exercises interesting.") and item 20 ("The CALI exercises help me concentrate on studying Japanese.") were rated 0.5 higher by the output-focused group than by the input-focused group. The students in the output-focused group appear somewhat more enthusiastic about the computer exercises they received than the students in the input-focused group.

Table 4: The questionnaire on the computer program

Item	Input group		Output group	
	Mean	SD	Mean	SD
1. The instructions in the program are clear.	4.9	0.4	4.7	0.5
2. The program is easy to use.	4.3	1.1	4.0	1.0
3. I didn't have technical problems when working on the program.	4.3	1.1	3.4	1.1
4. The grammar notes are helpful.	4.8	0.4	4.7	0.5
5. The grammar notes are written clearly.	4.8	0.4	4.7	0.5
6. I referred to the grammar notes when doing the CALI exercises.	Yes (5) No (2)		Yes (5) No (2)	
7. The format of each CALI exercise is good.	4.6	1.1	4.4	0.8
8. The content of the CALI exercises is good.	4.4	1.1	4.6	0.5
9. The processing of feedback is fast enough.	4.3	1.1	3.0	1.6
10. The error messages are easy to understand.	4.4	1.1	4.4	0.8
11. The error messages are helpful in pointing out what is wrong with my response.	4.4	1.0	4.6	0.5
12. The error messages are helpful in pointing out why my response is wrong.	4.3	1.3	4.3	0.8
13. The error messages have the appropriate amount of detail.	4.3	1.0	4.3	0.5
14. The quality of the error messages is good.	4.4	0.8	4.4	0.5
15. I referred to the vocabulary hints during the CALI exercises. If yes;	Yes (5) No (2)		Yes (7) No (0)	
a. the vocabulary hints are helpful.	4.4	0.9	4.7	0.5
16. I can work on the CALI exercises at my own pace.	4.6	0.5	4.9	0.4
17. I did not get nervous while I was working on the CALI exercises.	4.4	0.8	4.7	0.5
18. The CALI exercises help me practice Japanese by myself.	3.9	1.6	4.7	0.5
19. I find the CALI exercises interesting.	4.1	1.2	4.6	0.5
20. The CALI exercises help me concentrate on studying Japanese.	3.9	1.1	4.4	0.8
21. I want to practice Japanese using this type of CALI exercise on a regular basis.	3.6	1.6	4.4	0.8
22. The CALI exercises are good as supplementary work outside of the classroom in learning Japanese.	4.3	1.3	4.4	0.5
23. I learned a lot from the CALI exercises.	4.4	1.1	4.6	0.5

On the questionnaire, the students were also asked to write their impressions of the computer program. All students (except for one in the input-focused group) expressed that they like the computer program. One student in the output-focused group commented that "this program taught us in two weeks what would have taken about a month otherwise." In fact, the computer program provided intensive, systematic lessons regarding different forms of Japanese honorifics, which would take several months in any conventional Japanese textbook. This type of computer program may be efficient for teaching complex grammar and developing the learner's grammatical competence.

CONCLUSIONS

The present study employed computer software to provide various types of comprehension and production tasks and examined the relative effectiveness of comprehension and production practice in the acquisition of Japanese honorifics. The results of the study suggest that given the same grammatical instruction, output-focused practice is more effective than input-focused practice for the development of skill in producing Japanese honorifics and is equally effective for the comprehension of these structures. Increased effectiveness of production practice over comprehension practice was observed in both written and oral production. The analysis of different types of exercises suggests that the relative advantage of production practice may be greater in tasks involving complex syntactic processing than in tasks requiring less syntactic processing. The results support Swain's argument that there are roles for output in second language acquisition that are independent of comprehensible input.

The present study focused on the acquisition of Japanese honorifics. Even though Japanese honorifics represent relatively complex structures of a second language, it might still be too early to infer any general conclusion from these findings. The relative effectiveness of input and output practice in second language acquisition may depend on the types of target structures, as suggested by DeKeyser and Sokalski (1996), and on the kinds of tasks the students are required to perform. The author is now expanding this research, addressing these issues.

The questionnaire results indicate that the students in both groups had positive attitudes toward the computer program they used. Based on such positive reactions, the author has developed computer software covering seventeen lessons, following the output-focused approach.[27] The new programs are **BANZAI: NOMINAL MODIFIER** (consisting of two lessons on Japanese nominal modifiers), **BANZAI: CONDITIONAL** (consisting of two lessons on Japanese conditional expressions), **BANZAI:** (consisting of two lessons on Japanese causative expressions), and **BANZAI: SENTENCE MODIFIER** (consisting of two lessons on Japanese sentence modifiers). These programs have been successfully implemented in the language curriculum at the college-level. Continuing research on the relative effectiveness of different exercise formats will help to guide the development of the next generation of computer-assisted language instruction software.

NOTES

1. DeKeyser reports that the fuzzy rules were learned better by the implicit-inductive subjects than by the explicit-deductive subjects, but he also notes that the results regarding the fuzzy rules should be treated with caution, due to the small data set and the lack of statistical testing.

2. "Comprehensible input" is defined by Krashen as input containing i+1, where i is the acquirer's current level and i+1 is structure a bit beyond the current level.

3. Only the processing group was informed that language learners often misinterpret NVN sequences (1993a, p. 232); the processing group practiced OVS sentences but the traditional group did not (1993b, p. 53); and so forth.

4. The processing instruction adopted the "meaning-form connection" approach (Terrell, 1991), which encourages the learners to understand the concepts and meanings underlying the grammatical forms, but the traditional instruction followed a more mechanical, paradigmatic presentation of grammatical forms.

5. Cadierno (1995) extended the study using Spanish past tense verb morphology and obtained results similar to those in VanPatten and Cadierno (1993a, 1993b).

6. According to Swain, "comprehensible output" means "output that extends the linguistic repertoire of the learner as he or she attempts to create precisely and appropriately the meaning desired," (Swain, 1985, p. 252).

7. Krashen discusses the relative complexity of a target structure in terms of formal and functional/conceptual complexity (1987, pp. 97-98), so the term "complexity" in the present paper includes both formal and functional/conceptual complexity of a structure.

8. The description of the Japanese honorific system in this paper is based on Clancy's (1985) study, "honorifics and late acquisition of L1 Japanese", the in-group and out-group concepts are from Jorden's textbook (1987), the honorific usage is provided by Simon's grammar notes (1987) and Mizutani and Mizutani's textbook (1977), and by discussions with Kyoko Suda (Instructor of Japanese, University of San Francisco).

9. There is another regular, respectful verb form, "V-(r)areru," but this study focuses on the form "*o +* verbal stem + *ni narimasu*." The romanization used in this paper is an adaptation of the Shin-kunrei-shiki 'New official system' (Jorden, 1987).

10. The concepts of in-group and out-group also shift depending on context. For example, when a speaker belongs to Company A and talks to a person who belongs to Company B, the speaker uses a humble form to describe not only his or her own action but also the actions of other members in Company A (including the speaker's superior) because all members in Company A are now members of the speaker's in-group when speaking to a person in a different company (out-group). Since the students in this study were still at an elementary level and were introduced to Japanese honorifics for the first time, the situations in which the students were instructed to use honorifics in the program were mostly limited to a school situation (in which a student talks to his or her teacher or talks about the teacher with other people), or a company situation (in which an office worker talks to his or her superior or talks about the superior with his or her colleague). Examples of out-group/in-group shift were not included in the program.

11. The student who obtained the highest score and the student who obtained the second highest score on the mid-term exam were paired and were randomly assigned to one of two groups. The same pairing system was applied until the last two students (the students with the two lowest scores) were paired and randomly assigned to one of two groups.

12. The two-sample dependent t-test (the paired two-sample t-test) was applied to examine whether there is a significant difference between the input-focused group and the output-focused group in their scores on the mid-term exam. See Glasnapp and Poggio (1985) for a description of the t-test for correlated samples. The mean score of the input-focused group on the mid-term exam was 86.9 (SD = 11.6) and that of the output-focused group was 88.2 (SD = 9.3).

13. One might argue that since Korean has its own honorific system, the student with a Korean background may have had an advantage in learning Japanese honorifics. However, the Korean student is included in the input-focused group in this study, so this argument strengthens the result, since the output-group actually performed better than the input-group. A statistical analysis was also performed to check the results when the Korean student (in the input-focused group) and the student paired with the Korean student (in the output-focused group) were excluded from the study. The results were still significant, favoring the output-focused group.

14. In order to reduce the lexical load, the computer programs employed only vocabulary that had been introduced before (except for four nouns such as *katyoo*, 'section chief', *butyoo*, 'department chief', etc., and two verbs, *yomimasu*, 'read' and *hanasimasu*, 'talk', which were new).

15. The input-focused program employs the multiple choice format because it is typically used for comprehension exercises. However, multiple choice exercises may not necessarily capture the pedagogical benefits of all types of comprehension exercises. Some other question formats (such as asking learners to translate the target language into their first language by themselves) will be included in a future study.

16. The input-focused program stores a feedback message corresponding to each response to a multiple-choice question, so when the student selects a number, the corresponding message is provided.

17. The Japanese word processor works in the following way: the students type roman letters on the alphabetical keyboard and these roman letters are converted to katakana, hiragana, and kanji. (Katakana and hiragana represent Japanese syllables, so they are phonetic descriptions. Katakana are used to write words borrowed from English or other foreign languages. Hiragana are used mainly to write particles and grammatical inflections in verbs, adjectives, and adverbs. Kanji represent both sound and meaning. Japanese sentences are normally written with a mixture of hiragana, katakana, and kanji.) For homonymous words with the same romanization, the students obtain a list of kanji for the word and are asked to select the kanji that he/she thinks are appropriate.

18. The output-focused program analyzes the learner's response using a pattern matching technique: the program stores correct words, phrases, sentences, and anticipated errors for each question, and checks whether these items are found in the learner's response. (No parsing technique is involved in this study.) The program also stores feedback messages corresponding to correct answers and anticipated errors, so if the learner's response matches a correct answer or an anticipated error, a corresponding error message is provided. Anticipated errors include missing words/particles, incorrect/incomplete verbal forms, and incorrect Japanese writing systems.

19. Giving more exercises to the input-group also strengthens the result if the output-group performs better than the input-group, which is indeed the case.

20. Among 137 exercises, 41 exercises were of type 1, 45 of type 2, 35 of type 3, 8 of type 4, and 8 of type 5.

21. Among 130 additional comprehension exercises, 66 exercises were of type 1, 22 were for auditory comprehension of spoken honorific verbs (a combination of type 1 and type 5), 41 were for auditory comprehension of spoken honorific sentences (a combination of type 3 and type 5), and one was of type 4. The additional exercises for the input-focused group were intended to review comprehension of honorific verbal forms and to practice auditory comprehension of honorific sentences. Consequently, type 1, type 3, and type 5 tasks were mostly added for the input-focused group.

22. The first computer session focused on the irregular respectful forms and the irregular humble forms, the second computer session included the regular respectful form "*o* + verbal stem + *ni narimasu*", the third computer session introduced the regular humble form "*o* + verbal stem + *simasu*", and the fourth session reviewed all kinds of honorific sentences practiced in the previous sessions.

23. Different numbers of questions were drawn from the various question types on the achievement test. It should be kept in mind, however, that questions of different types could vary in the time and amount of work required to complete them. In particular, time constraints limited the number of type 4 questions that could be administered. Development of a more principled measure is an important topic for future study.

24. Type 3 production scores exhibit the largest difference between the two groups on the achievement test, and the retention production test included only type 3 tasks. The t-score might have been lower if other types of tasks were included in the retention test.

25. When multiple t-tests are performed on a series of null hypotheses, the probability of committing at least one type I error (i.e., the probability of mistakenly rejecting the null hypothesis) may be higher than the significance level employed in each of the tests. To achieve a significance level of alpha for the conjunction of the null hypotheses, it suffices to divide the significance level of each of the individual tests by the number of tests performed (Galambos & Simonelli 1996). Accordingly, suppose we select a significance level of 0.05 for the present study as a whole and perform t-tests for the mid-term exam, the comprehension achievement test, the production achievement test, the comprehension retention test, the production retention test, and the oral conversation test. In this case, the significance level of each test becomes 0.008 (0.05 divided by 6). Only the production achievement test is significant at the 0.008 level. The tests that fail at this corrected significance level may nonetheless be regarded as heuristic indications for future study with a larger sample size.

26. $P = 0.179$ for item 3, $p = 0.111$ for item 9, $p = 0.194$ for item 18, $p = 0.410$ for item 19, $p = 0.277$ for item 20, and $p = 0.334$ for item 21.

27. The new programs are BANZAI: NOMINAL MODIFIERS (consisting of two lessons on Japanese nominal modifiers), BANZAI: CONDITIONALS (consisting of two lessons on Japanese conditional expressions), BANZAI: CAUSATIVES (consisting of two lessons on Japanese causative expressions), BANZAI: SENTENCE MODIFIERS (consisting of two lessons on Japanese sentence modifiers), BANZAI: GERUNDS (consisting of three lessons of Japanese expressions with verbal gerunds), BANZAI: VERBAL DIRECT STYLE (consisting of three lessons of Japanese expressions with direct-style verbs), and BANZAI: GIVING AND RECEIVING (consisting of three lessons of Japanese giving and receiving expressions). Anyone who is interested in the programs may request them from the author (nagatan@usfca.edu).

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APPENDIX A: Type 1 Comprehension and Production Exercises

The first type of exercise focuses on single-verb comprehension or production. The following illustrates one of the type 1 comprehension exercises. For the sake of illustration, English translation is provided in square brackets under each Japanese word in this paper, but such translation is not provided in the computer exercises.

(1) A comprehension exercise - type 1

Select an English equivalent to the following verb.

おかいになります

[buy (respectful)]

1. (I) will buy it.
2. (My friend) will buy it.
3. (My supervisor) will buy it.

In this exercise, the students are asked to choose an appropriate interpretation of the given verb *o-kai-ni-narimasu,* 'buy (respectful),' including the unstated subject of the sentence. In Japanese, the subject and object of a sentence are often dropped, so that a single verb functions as a sentence. (The unstated subject is indicated in the parentheses in each choice.) This is a comprehension exercise because the English translation selected by the student indicates his/her comprehension of the Japanese sentence provided. The correct answer for the above question is #3. Choice #1 and #2 are incorrect because the subject of *o-kai-ni-narimasu,* 'buy (respectful),' should be an out-group member (e.g., a superior). The output-focused program involves the same verb in the following production exercise:

(2) A production exercise - type 1

Give a Japanese equivalent to the following verb.

(My supervisor) will buy it.

The output-focused program asks the students to produce Japanese, according to the cue provided. The correct answer for (2) is *o-kai-ni-narimasu,*'buy (respectful)').

APPENDIX B: Type 2 Comprehension and Production Exercises

The second type of exercise provides a conversation using honorifics or plain forms. For example, the input-focused program asks the student to interpret the relationship between the two speakers (or between the speakers and the subject/object in the sentence) in the given conversation:

(3) A comprehension exercise - type 2

> Select an English equivalent to the following sentence.
> You: いつ Aメリカにおかえりになりますか。
>   [when America to return (respectful) QUES]
>   ['When will you return to America?']
>
> 1. You are asking your department chief when he returned to America.
> 2. You are asking your assistant when he will return to America.
> 3. You are asking your boss when he will return to America.

The correct answer for question (3) is # 1. The same conversation is used for a production exercise in which the student is asked to fill in the blank with an appropriate verb (either plain or honorific):

(4) A production exercise - type 2

> Type the missing part in your conversation.
>
> Your teacher asked if you will come to school tomorrow. Answer that yes, you will.
> Your teacher: あした学校に来ますか。
>   [tomorrow school to come (non-honorific) QUES]
> You: はい、 _____ 。
>   [yes]

The correct answer for question (4) is *mairimasu,* 'come (humble).'

APPENDIX C: Type 3 Comprehension and Production Exercises

The third type of exercise includes comprehension or production practice involving full sentences. The input-focused program provides the following sort:

(5) A comprehension exercise - type 3

> Select an English equivalent to the following sentence.
> You: いつ Aメリカにおかえりになりますか。
>   [when America to return (respectful) QUES]
>   ['When will you return to America?']
>
> 1. You are asking your department chief when he returned to America.
> 2. You are asking your assistant when he will return to America.
> 3. You are asking your boss when he will return to America.

The correct answer for question (5) is # 3. The same sentence is used for a production exercise:

(6) A production exercise - type 3What would you say in Japanese if you were in the following situation. Use honorifics if the situation is appropriate.

Your boss is going to London on business. Ask him when he will return to America.

The correct answer for question (6) is *Itu Amerika ni o-kaeri-ni-narimasu ka*, 'When will you return (respectful) to America?'

APPENDIX D: Type 4 Comprehension and Production Exercises
The fourth type of exercise presents a text for the student to read or revise. For example, the input-focused program provides the following text to interpret:

(7) A comprehension exercise - type 4

> The following is part of the note Mr. Mills wrote to his teacher. Read it and choose a
> number which corresponds to the text.
> 今日パーティーのプランをいたします。
> [Today party of plan OBJ do (humble)]
> ['(I) will make a plan for the party today.']
> あした先生にそのプランをお話しします。
> [tomorrow teacher to the plan talk (humble)]
> ['(I) will tell you (teacher) the plan tomorrow.']
> あしたがっこうにまいりますけど、
> [tomorrow school to come (humble) but]
> ['(I) will come to school tomorrow, but']
> 先生はいらっしゃいますか。
> [teacher TOP come QUES (respectful)]
> ['are you (teacher) coming (to school tomorrow)?']
>
> 1. Mr. Mills' teacher will make a plan for the party. The teacher will talk about the plan
> tomorrow. The teacher will come to school tomorrow.
> 2. Mr. Mills will make a plan for the party. He will tell the teacher the plan tomorrow
> because the teacher is coming to school tomorrow.
> 3. Mr. Mills will make a plan for the party. He will tell the teacher the plan tomorrow.
> He is asking if the teacher is coming to school.

The correct answer for question (7) is # 3. The same text is used for a production exercise, but the verbs in the text are presented with the plain forms and a student is asked to revise the text using appropriate honorific forms:

(8) A production exercise - type 4

> The following is part of the note Mr. Mills wrote to his teacher. Revise the text using appropriate
> honorifics. Delete the words you want to change and type in the correct words.
> 今日パーティーのプランをします。
> [Today party of plan OBJ do (non-honorific)]
> ['(I) will make a plan for the party today.']
> あした先生にそのプランを話します。
> [tomorrow teacher to the plan talk (non-honorific)]
> ['(I) will tell you (teacher) the plan tomorrow.']
> あしたがっこうに来ますけど、
> [tomorrow school to come (non-honorific) but]
> ['(I) will come to school tomorrow, but']
> 先生は来ますか。
> [teacher TOP come QUES (non-honorific)]
> ['are you (teacher) coming (to school tomorrow)?']

Question (8) includes four plain verbs, in which the first three verbs should be replaced with their humble forms and the fourth verb should be replaced with its honorific form. One might say that this type of exercise involves comprehension of the text. However, the text is presented using non-honorific forms, so the target structures (honorifics) are not used for comprehension. That is, the target structures (honorifics) are not the ones to comprehend but the ones to be produced.

APPENDIX E: Type 5 Comprehension and Production Exercises

The fifth type of exercise uses oral cues. The input-focused program presents orally a short story (consisting of a few Japanese sentences) and asks the student to interpret it. The oral cue provided in (9) is as follows: *Sensee wa kooen de haikingu o nasaimasita* 'My teacher did hiking in a park'; *Sore kara, Nihonmati no resutoran de osusi to osake o mesiagarimasita* 'Then, he had sushi and sake at a restaurant in Japan Town.'

(9) A comprehension exercise - type 5

Ms. Brown talked to her colleague. Choose a number which corresponds to what she said.

1. Ms. Brown went hiking in a park. Then, she had sushi and sake at a restaurant in Japan Town.

2. Ms. Brown's teacher went hiking in a park. Then, he had sushi and sake at a restaurant in Japan Town.

3. Ms. Brown's teacher went on a picnic in a park. He didn't go to a restaurant in Japan Town.

The correct answer is #2. The output-focused program also presents the same story orally, but the task is to dictate the story:

(10) A production exercise - type 5

Ms. Brown talked to her colleague. What did she say? Make notes on paper first, and then type it in the box.

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