The Effects of a CALL Based Task on False Beginners' Acquisition of Irregularly Spelled Words in English

Tomoko NAKAMURA
Hiroshima International University

Hironobu MATSUOKA
Yasuda Women's University

Abstract

The purpose of this paper is to discuss the effects of two types of training: a phoneme segmentation task and a CALL based sound-to-spelling task. These two types of training for false beginners, low proficiency adults at university, are based on the results of previous experiments of oral reading and dictation of single words. The data collected from students ranging from seventh grade to university showed that automaticity of single word processing is a prerequisite for Japanese EFL learners to pass smoothly from the beginner to intermediate level of L2 development.

In the present paper, we will discuss the following points: (1) how we modified the first training, and (2) how false beginners can successfully learn the spelling of English words using a CALL based task.

1. Background

The results of the experiments of oral reading and dictation of single words revealed the distinctive features of false beginners, as follows (Nakamura 1998, 2000, 2001): (1) Backsliding in false beginners occurs in comprehension. Their level in this area is equivalent to that of ninth graders. (2) False beginners can read a passage aloud better than ninth graders when most of the words in the passage are regular words. (3) False beginners’ regular reading of words with an irregular spelling-to-sound correspondence is the signal of their inhibition towards successfully embracing a semantic system. (4) When their learning of spelling is insufficient, phonetic information of L1 as well as L2 compensates for the deficiency and helps them to access meaning.
(5) Comparison of data collected from high proficiency ninth graders with data collected from false beginners shows that reducing Japanese English language beginners’ dependence on misleading L1 knowledge in L2 word recognition is essential. Therefore, this research is based on the assumption that their backsliding may occur from the very beginning, i.e., insufficient recoding and decoding of single words of the target language.

Based on these findings, we started the experiment by conducting print-to-sound training with phoneme segmentation on false beginners. This experiment refers to the results of research concerning the effects of different types of training on L1 children’s acquisition of single words. Yopp (1988) determines the reliability and validity of ten tasks for phonetic awareness and concludes that sound isolation and phoneme deletion tasks contribute to the prediction of children’s reading ability. The researchers wondered if the same tasks could be applied to L2 acquisition. This is our research question for Training 1.

2. Training 1: Phoneme Segmentation Task

2.1. Research Questions

The goals of this training are to examine whether or not the training with phoneme segmentation is effective in improving false beginners’ English lexical processing and to discuss what kind of stimulus words should be presented to the participants to improve their lexical processing.

2.2. Participants

The participants for the training are false beginners.

2.3. Instruments

The following instruments were used in this training: (1) a reading comprehension test for Pre-STEP 2 and STEP 3 given in the fall of 1998; (2) a list of 40 visually-presented English words (20 regular words and 20 irregular words) and 40 orally-presented English words (20 regular words and 20 irregular words) for pre and post tests (Appendix 1); (3) a list of 120 English words (60 regular words and 60 irregular words) for phonological training (Appendix 2); (4) a cassette tape containing a recording of 40 English words orally presented by a native English speaker.

2.4. Procedure

2.4.1 Grouping of participants

82 university freshmen with low English proficiency took the reading comprehension test, and they were divided into four groups so that each group’s mean score of the test results was equal. We used only the data of those who attended every class for five weeks (the first group, n=15; the second group, n=20; the third group, n=14; the fourth group, n=20). There was not a significant
difference among the groups’ mean score, \( F(3, 65) = 0.674 \) n.s.

2.4.2. Experiment

We conducted a five week experiment of students whose English classes were held once a week in a language lab. On the first and the fifth weeks, participants took pre and post tests, and during the intervening three weeks they did a phoneme segmentation task for ten minutes at the beginning and at the end of each 90 minute lesson. Participants repeated the teacher’s model pronunciation of the word simultaneously with the presentation of the pronunciation of each phoneme and the meaning of the word in Japanese on the computer display. For example, one such test item was \( \text{LOSE}---/\text{louz}/---/\text{n}/, /\text{u}/, /\text{z}---/\text{ushinau}. \) The OHC was used to visually present each stimulus word, and microphones and headsets were used to orally present each word with its corresponding phonemes and Japanese meaning.

The first group practiced 120 regular words, the second group practiced both word types, 60 regular words and 60 irregular words, the third group practiced 120 irregular words, and the fourth group, a control group, did not take any training. The reaction time and scores of pre and post tests were used for statistical analysis, and errors were used for qualitative analysis.

2.5. Criteria for the selection of words

All the target words were selected from the words, which appear in the English textbooks for junior high school students, listed by Miura (1987). The frequency, the number of syllables, and the imageability of the words (Clark, 1997) are controlled.

Some words were omitted such as English words daily used as loan words in Japanese, words with homophones, proper nouns, and words with inflectional endings. If one word has two or more meanings, the participants were told to give the meaning which first occurred to them.

Regular and irregular words were selected by referring to existing research in the field: Henderson (1982), Seidenberg & McClelland (1989), and Funnell (1996). Regular words, i.e., words with a regular spelling-to-sound correspondence, were selected according to the criterion that the words would be comparatively easy to decode in terms of pronunciation depending on knowledge of English sounds. Irregular words, i.e., words with irregular spelling-to-sound correspondences, were selected as they would require English language learners’ conscious learning about the specific words’ pronunciation because of their irregularity.

2.6. Criteria for error

2.6.1. Pronunciation

Participants’ pronunciation was checked according to the following criteria: pronunciation of silent letters, e.g., \( \text{HALF}: /\text{halfl}; \) mispronunciation of vowels, e.g., \( \text{LOSE}: /\text{louz}=/; \) and pronunciation followed by inflected endings, e.g., \( \text{MINUTE}: /\text{minits}/. \)
2.6.2. Meanings in Japanese

The criterion for the meaning of test items is based on Kenkyusha’s New English–Japanese Dictionary (1980). If participant’s translation belongs to a different part of speech, it is counted as incorrect, e.g., INTERESTING (an adjective): kyoumi (a noun).

In pre and post tests as well as the training, the order of presenting regular and irregular words orally and visually was changed.

2.7. Results and Discussion

Separate analyses were performed on measures of participants’ naming and dictation accuracy of performance.

2.7.1. Qualitative Analysis

Naming Task. Naming errors were divided into six categories: (1) regular reading of irregularly spelled words, e.g., LOSE--/louz/; (2) morphological errors, e.g., LISTEN--/lisni/; (3) errors caused by visual analysis, e.g., EVENING--/evriηiη/; (4) accent errors, e.g., FOREIGN--/fə:ri:n/; (5) phoneme errors, e.g., GLAD--/glied/; and (6) null responses. Because the main cause of errors (50.2% of all the errors) was that the students tried to apply a regular reading to irregularly spelled words, the frequencies of this type of error in pre and post tests were compared. Two factor analyses of variance showed that the training effects × word type interaction was significant, $(F(3, 65)=4.562\ p<.01)$. Post hoc comparison showed that there was a significant training effect in the second group who practiced both regular and irregular words. This group significantly reduced the frequency of attempted regular readings of irregularly spelled words. It is supposed that training both regular and irregular words helped participants have awareness of two types of English words whose lexical processing is different.

Dictation Task. The main effect of word types and training effects × word types interaction were not significant: regular words, $F(3, 65)=0.891\ n.s.\ ;$ irregular words, $F(3, 65)=0.865\ n.s.$.

In conclusion, phoneme segmentation training was effective in training phonological awareness in naming English words, but not in improving their English orthographical knowledge. Therefore, we designed the next training, sound-to-spelling training with a CALL based task, to improve the false beginners’ orthographical knowledge exclusively.

3. Training 2: Sound-to-Spelling Training with CALL Based Tasks

We designed Training 2 by modifying Training 1 in order to gain its effects on spelling. We tried to lower the hurdles the participants had to get over as follows:

(1) We selected 40 words (20 regular and 20 irregular words) for pre and post tests in the word list used for three week training. In Training 1, we selected different words for tests from those used
for the training. (2) We used a CALL classroom so that each participant could take enough time according to his/her learning speed. (3) In training, Japanese meaning for each word was presented on the display attached to each participant’s desk. (4) In pre and post tests, the participants spelled out the word after repeating the teacher’s oral presentation of the word using headsets and microphones to avoid errors caused by mishearing.

3.1. Research questions

The goal of this training was to examine how false beginners could learn the spelling of basic words effectively.

3.2. Instruments

The following instruments were used in Training 2: (1) A STEP 3 test given in the fall of 2001; (2) A list of 40 orally-presented English words (20 regular words and 20 irregular words) for pre- and post tests. They were selected from the word list used for training; (3) A list of 120 English words (60 regular words and 60 irregular words) for training (Appendix 2).

3.3. Procedure

3.3.1. Grouping of participants

171 university freshmen whose English levels were estimated as at the level of approximately STEP 3 or lower, took a STEP 3 test, the bottom 96 students were selected as false beginners, and were divided into three groups so that each group’s mean score of the STEP 3 test results were equal. We used only the data of those who attended every class for five weeks (the first group, n=31; the second group, n=23; the third group, n=32). There was no significant difference among the groups’ mean scores, (F(2, 83)=0.242 n.s.).

3.3.2. Experiment

This was a five week experiment in English classes, held once a week, in a CALL classroom equipped with personal computers as well as language lab equipment such as headset, microphone, etc. On the first and fifth weeks, participants took pre and post tests of spelling and meaning in Japanese. During the intervening three weeks, the first and second groups did task work; the first group rearranged randomly presented letters on the display using a mouse to spell out the word. The meaning was visually presented in Japanese on the display and the pronunciation was orally presented through a headset, and the spelling of each word was automatically corrected. The task of the second group was similar to Training 1: print-to-sound processing. They practiced the pronunciation of the word by listening to model reading of it through a headset while referring to visually presented words and meaning on the display. The third group, a control group, did not participate in the training. A 30 second time limit was set to process each word, but participants were allowed to try it again. In pre and post tests as well as
the training, the order of presenting regular and irregular words orally was changed.

3.4. Criteria for the selection of words and errors
The criteria for the selection of words and errors were identical to that used in Training 1.

3.5. Results and Discussion
Figures 1 and 2 compare dictation and meaning scores of orally presented regular words and irregular words respectively. Dictation scores were counted only when the spelling and the translation of a word were correct.

![Regular Words](image1)

![Irregular Words](image2)

Fig. 1 Dictation and meaning scores of orally presented regular words
Fig. 2 Dictation and meaning scores of orally presented irregular words

Dictation and meaning scores were analyzed in a 3 (groups) × 2 (word types) × 2 (pre and post test results) analyses of variance. The main effect of pre and post tests, \(F(1, 83)=10.005, p<.000\), regularity effects, \(F(1, 83)=146.979, p<.000\), and groups × pre and post tests interaction, \(F(2, 83)=20.526, p<.001\), were significant. Post hoc comparisons indicated that the differences of pre and post test results in the first and second groups were significant, \(F(1, 166)=61.015, p<.000\), and \(F(1, 166)=18.143, p<0.0001\) respectively.

Therefore, the findings based on the statistics above are as follows. (1) There were significant training effects on those who took the training using CALL based tasks; on the other hand, there was no significant difference between the control group’s pre and post test scores, \(F(1, 83)=2.256, \text{n.s.}\). (2) It is more difficult for false beginners to learn the spellings of irregular words than those of regular words.

Pre and post test results of the first and second groups were further analyzed to find out if
there are any differences in the training effects between regular and irregular words. Two factor analyses of variance showed that the groups × training effects interaction in learning regular words tended to be significant, \( F(2, 83)=2.522, p<.0864+ \), and there was no significant difference between groups, \( F(2, 83)=14.698, \text{n.s.} \). On the other hand, the groups × training effects interaction in learning irregular words was significant, \( F(2, 83)=11.881, p<.0000 \). We conducted post hoc comparisons because there was a tendency to be significant, \( F(2, 83)=2.661, p=0.0728+ \), and Ryan's multiple comparison test showed an almost significant difference of the irregular word spelling test scores of pre and post tests between the first group and the second group.

<table>
<thead>
<tr>
<th>Pair</th>
<th>r</th>
<th>nominal level</th>
<th>t</th>
<th>p</th>
<th>sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>3</td>
<td>0.267</td>
<td>1.949</td>
<td>0.053</td>
<td>s.</td>
</tr>
<tr>
<td>1-3</td>
<td>2</td>
<td>0.533</td>
<td>2.106</td>
<td>0.037</td>
<td>s.</td>
</tr>
<tr>
<td>3-2</td>
<td>2</td>
<td>0.533</td>
<td>0.021</td>
<td>0.984</td>
<td>n.s.</td>
</tr>
</tbody>
</table>

\[ \text{Mse}=9.927562, \quad \text{df}=166 \]

In conclusion, it turned out that the first group who did the task to rearrange randomly presented letters to spell out a word gained better spelling test scores on irregular words after the training than the second group who did a phonological awareness task.

The result of Training 1 shows that a phoneme segmentation task helps false beginners obtain phonological awareness of English words; however, orthographical knowledge does not seem so easily acquired. We took the hints in designing Training 2 from our observation of L1 children who were slow learners in L1 acquisition, they played with toys of plastic alphabets or make shapes of them with clay. Japanese EFL learners are not allowed to spend a lengthy enough time to get used to unfamiliar shapes of the English alphabet. The basic idea in creating a CALL program was to give false beginners a number of chances to play with the English alphabet using a PC. It was an encouraging finding that we observed their enthusiasm for using a CALL based task during the training. This may afford some new perspectives on how to use a CALL classroom for many false beginners of English language who are supposed to exist in this country.

4. Conclusion and Pedagogical Implications

In Japan it is estimated that the number of false beginners is vast. With the decrease of the 18-year-old population, universities tend to accept the entry of such low-level students, as never before seen in the university classroom. Yet, how we can teach them effectively has not been explicitly discussed. It is a critical issue for language teachers to systematize the
assessment of learners’ English proficiency levels and seek more effective teaching methodologies. It was a side discovery of our experiment that using a CALL classroom enhances false beginners’ motivation. The results of our experiment also show that language teachers should be sensitive to these demands on EFL learners and respond in an aware and principled way, especially those who teach seventh graders, who are encountering a second language for the first time in Japan. What, in practical terms, this should be is a subject for classroom-based research.

Notes

1. If one word has more than two meanings, the most frequently used meaning (Miura, 1987) was presented.
2. Regular words used for naming words: the number of syllables=1.8; frequency=16.4; imageability=524.4. Irregular words: the number of syllables=1.6; frequencies=26.05; imageability=473.9. Regular words used for dictation: the number of syllables=1.6; frequency=26.05; imageability=544.75. Irregular words: the number of syllables=1.4; frequencies=27.6; imageability=518.4.
3. Nakamura (2000) applies Funnell’s three-route model of single word reading to explain Japanese EFL learners’ sound-to-print processing of single words. It is essential to take the direct lexical route in processing irregular words, but it is possible to take the sublexical route according to sound-to-spelling correspondence in processing regular words.

References


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Appendix 1

Words used for pre and post tests of Training 1:
Naming task:
Regular words: glad, grow, fifteen, interesting, holiday, animal, dinner, river, evening, strong, snow, hospital, sick, sing, spring, rich, clock, finish, travel, window.
Irregular words: answer, foreign, breakfast, child, famous, country, half, fight, busy, early, watch, listen, laugh, lose, minute, young, chair, down, south, fruit.

Dictation task:
Regular words: drink, fish, king, story, dark, garden, letter, black, important, bank, stand, green, student, pencil, sister, winter, begin, voice, hard, afternoon.
Irregular words: boat, head, mouth, bread, future, air, friend, build, town, because, mountain, once, heart, teach, quiet, beautiful, great, science, face, enough.

Appendix 2

Words used for Training 1 and 2:
Regular words: across, after, arrow, ask, before, below, better, bring, carry, city, common, desk, destroy, dictionary, different, enjoy, enter, factory, family, farm, festival, forget, help, hill, history, horse, insect, large, million, north, order, origin, perhaps, poison, popular, pretty, prison, problem, protect, remember, respect, shadow, show, spend, splendid, storm, strict, strong, today, together, tomorrow, vegetable, victory, yellow, yesterday, yard, window, river.
Irregular words: lose, above, afraid, again, around, arrive, area, beach, feather, become, behind, blood, blue, castle, catch, climb, come, count, cousin, mouth, daughter, heart, favorite, find, flight, food, goose, ground, guide, heaven, laugh, country, house, island, kind, during, leaf, move, near, often, people, ready, glove, shout, foreign, sound, spinach, straight, sword, through, thumb, tomb, famous, touch, various, weather, wool, ceiling.