Developmental Process of L2 Speaking Ability:

From a Cognitive Linguistic Perspective

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Abstract

The present study attempts to examine the developmental processes of two types of speaking ability of Japanese EFL learners by analyzing the breadth and depth of conjunction use in oral performance. Based on Cummins’ Hypothesis (1980), the author (2004) generated a research hypothesis focusing on the commonalities and dissimilarities between the two types, including BICS-type speaking and CALP-type speaking, and tested it by four studies (2005a, 2006a). From a cognitive linguistic perspective, the interlanguage corpus data gathered through the performance tests enabled the author to examine the internal process of linguistic production and information processing by inspecting the participants’ use of conjunctions. Hierarchical cluster analysis with two explanatory variables yielded different types of grouping between the two types of oral performance. Accordingly, it was found that the two types of speaking ability were acquired through different developmental stages.

1. Introduction

The era has come when Japanese EFL learners are expected to acquire ‘Global Literacy,’ or abilities for international communication in order to survive in this globalizing society with highly advanced information technology, as global citizens for mutual harmony, benefit and world peace. Speaking ability is a core of such literacy for practical communication (MEXT), which anyone concerned in TESL/TEFL endeavors to develop. Numerous researchers have argued it, especially in the field of testing on oral proficiency or speaking ability. Much empirical research on rating scales for oral performance has demonstrated the complexity of speaking ability and the difference between competence and performance (Hudson, 2005). However, some simple but critical
questions remain. All should be answered to clarify the factors contributing to learning. It is pivotal and essential in order for teachers or instructors to encourage their learners to learn EFL as efficiently as possible, facilitating them in communicating. Very few studies have been undertaken to answer such questions by investigating the structure of such ability in an empirical approach.

The author (2004) defined two types of speaking ability based on Cummins’ Dichotomy of English Proficiency (1980). They are BICS-type speaking [BICS-S] ability and CALP-type speaking [CALP-S] ability, distinguished according to the criteria related to cognition. A research hypothesis was generated, explaining that each has its own structure, comprised of linguistic variables, affective variables, and cognitive variables. Through four studies from a psychological perspective, even along with a corpus-based analysis, the author’s hypothesis was subsequently tested (2005ab, 2006a). The major findings were as follows. BICS-S ability, the one for interpersonal communication, is contributed to mainly by the affective factors, such as L2 learning motivation and willingness to communicate. Meanwhile, CALP-S ability has literacy as its core, which is needed for cognitive and academic language use. The ability is explained positively and moderately by the highly cognitively demanding reading, not BICS-S. An analysis of an interlanguage research corpus [IRC], which the author designed and compiled from the oral performance data, found some salient differences in lexicogrammatical features between the two. Furthermore, all these have reaffirmed the significance of continuing to test the hypothesis on the basis of Cummins’ Hypothesis, which is still highly evaluated but very vague and controversial as Cummins himself pointed out (2003; Ellis, 1994). In particular, a series of studies should be done to resolve a remaining issue on cognition, a constituent of L2 speaking ability, by comparing the two types of speaking. This research is to examine a part of the issue more closely by analyzing conjunction use in spontaneous linguistic production by Japanese EFL university students.

2. Background of the study

2.1 Rationale

2.1.1 Cognitive Linguistics perspective

Cognitive Linguistics claims that linguistic performance is a subjective activity by a cognitive operator and a linguistic structure is motivated with respect to the three kinds of constructions experientially (Taylor, 2004). Furthermore, a human, or a cognitive operator, should generate linguistic structure and function through reciprocal interaction between him/herself and the perceptual (Langacker, 1987). It follows that the length of utterance or complexity of oral performance has a close relationship with some linguistic experience and learning career of the speaker.

Speaking is an activity of producing linguistic output spontaneously through a cognitive process. Especially in the case of L2 speaking, a conceptualizer and formulator play a more vital and significant role in the internal speech production process (de Bot, 1992; Levelt, 1989). It is,
therefore, important to focus on the development of such components, including information processing in order to examine the developmental stages of L2 speaking ability.

Here, conjunctions should be selected as a target subject for analysis because they can project cognition in speaking. They are particles and function words, which are embedded in the context. They possibly provide ambiguity among their usages in the content, epistemic, and conversational domains. In the content domain, they serve as just a contributor to clause combing and information enhancing, while they show, on a syntactic structure level, the diversification in the domain of literal interpretation. Furthermore, it is possible that they may be able to construe things in the cognitive domain, based on their physical experiences, and in the speech act domain, as Sweetser (1990) argued by analyzing spoken language. This enables the author to examine their polysemic use, which may be a measure of cognition development.

2.1.2 Preceding Research on Conjunction

CANCORDE Corpus and Longman Spoken and Written English Corpus (Biber et al, 1999) described the actual use of grammatical features. It stated that function words cover approximately 40% of the L1 text, including two major register categories: conversation and news. Conjunctions, some of them, essentially appear even in L2 texts, whether the text is cognitively demanding or undemanding, context embedded or reduced (Cummins, 1986), all of which occur in the most frequent 2000 words of English (Nation, 2001). Biber et al also pointed out that the variety of conjunctions used in a proper context or situation can indicate the linguistic proficiency of the speaker.

It can therefore be said that a two-dimensional analysis on conjunction use in order to judge the development or proficiency of oral production is necessary to investigate the developmental process of the L2 speaking ability of EFL learners, including cognition as its constituent.

2.2 Definition of the key concepts

The four of the author’s preceding studies described earlier posed the definitions of the main concept for this study as follows:

a) BICS-type speaking [BICS-S] ability

This is the speaking ability needed for basic interpersonal communication, whose function is mainly to convey information. The situation is context embedded and its linguistic production process is less cognitively demanding.

b) CALP-type speaking [CALP-S] ability

This is the speaking ability needed in speaking in an academic or professional discourse community. Its main function is to negotiate or argue with some proof or evidence, sometimes processing information. It is marked by communication of a context reduced style and highly demanding in cognition with very complex linguistic or information processing.

2.3 Research purpose
The purpose of this study was to examine the developmental process of the two types of speaking ability, defined above by analyzing the established IRC (aforementioned, 2006). Based on the literature review as discussed earlier, the following three research questions were posed.

RQ1) What are the characteristics in the breadth and depth of conjunction use in the two types of oral performance by the Japanese EFL university students?

RQ2) Are there some similarities or dissimilarities between the two types of speaking in explanatory relation by conjunction use?

RQ3) What are similarities or dissimilarities among the clusters in efficiency of oral product, or the quality of oral performance?

3. Method

3.1 Participants

Sixty-three Japanese EFL undergraduate university students in their first and second year majoring in English Education participated in this research survey, which included two types of oral performance tests [OPT]. Examining the data qualitatively and eliminating the two outliers and twelve defective cases, forty-nine data were available for the statistical analysis. Several statistical procedures found that this survey sample was extremely homogeneous, consisting of highly motivated learners with similar English learning experiences, whose English proficiency level ranged from upper-intermediate to advanced (The author, 2005b).

3.2 Data collection

3.2.1 Interlanguage Corpus

The IRC, converted from the oral performance data recorded, was configured with the following two categories: (a) spoken text narrative [STN] and (b) spoken text argumentative [STA]. In a converting process, the punctuation and 0-conjunction were determined by the analysis of meta-linguistic cues, including tone, pause, and intonation (Halliday, 2004).

Table 1

<table>
<thead>
<tr>
<th>Kind</th>
<th>Category</th>
<th>Tag</th>
<th>Tagging Target words</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Error Tag</td>
<td>Unmarked</td>
<td>*</td>
<td>words used incorrectly</td>
<td>Biber et al. (1999)</td>
</tr>
<tr>
<td>(b) Overlapping Function</td>
<td>Unmarked</td>
<td>0</td>
<td>words which are used correctly as other articles such as adv. and prep.</td>
<td></td>
</tr>
<tr>
<td>(c) Parataxis contributors</td>
<td>Marked</td>
<td>1</td>
<td>words contributing to parataxis.</td>
<td>Halliday (2004)</td>
</tr>
<tr>
<td>(d) Hypotaxis contributors</td>
<td>Marked</td>
<td>2</td>
<td>words contributing to hypotaxis.</td>
<td></td>
</tr>
<tr>
<td>(e) and/because subcategories for Polysemic Use</td>
<td></td>
<td>11/22</td>
<td>and/because in correct usage, subcategorized by the defined criteria</td>
<td>Sweetser (1990)</td>
</tr>
</tbody>
</table>

94
3.2.2 Tagging

As discussed earlier, five kinds of grammatical tag were added, as summarized in Table 1. All the words tagged in this research are the words whose morpheme is conjunction. The words tagged as 'marked' are the words which contribute to the combining of finite clauses, not non-finite clauses (Halliday, 2004).

As for tagging in ‘and / because’ subcategories, tagging criteria needed to be set up according to Sweetser (1990). Examination of the concordance led to a judgment that what could be analyzed to find pragmatic ambiguity and dispersal among several domains including uses in content, epistemic, and speech-act domains were the following two: ‘and,’ the most general connective, and ‘because,’ or a causal conjunction. The resulting six tags and their criteria were decided as follows:

(11a) **and**: symmetric connection in a content domain

Children should be educated correctly <11a>and (they) have the opportunity to give the more good education.

(11b) **and**: temporal succession in a real world domain (asymmetric)

[I think,] Japan is changed <11b> and it will give us a big change in economy, politics, and) everything.

(11c) **and**: logical development in an epistemic domain (asymmetric)

Of course, social welfare or education is important, <11c>and the government should spend money on it.

(22a) **because**: causality in a real world domain

Education is more important than computer technology <22a>because there are a lot of children not only in Japan, <0>but also, of course, all over the world.

(22b) **because**: causality in a content domain

His mother explained to him <2>that milk box can be recycled, <22b>because milk box was made by trees.

(22c) **because**: causality in an epistemic (speech-act) domain

[I think (that)] we need more ALTs <22c>because the students don’t have much chance to speak with native speakers, in fact,…

The procedure of building up the research corpus aforementioned, tagging and checking were all done by the author herself. After a certain period, the intra-rater reliability was confirmed sufficiently enough to proceed forward.

3.2.3 Measuring

After measuring and calculating the following three indices: (a) Total Token of each text, (b) Frequency of the words contributing to parataxis and hypotaxis, (c) The number of lemmatized parataxis contributors [PC] and hypotaxis contributors [HC], the following two were computed:
(a) Diversification of conjunction use [Breadth]
    \[ \text{the number of lemmatized PC + the number of lemmatized HC} \times 2 \]
(b) Polysemic dispersion of conjunction use [Depth]
    \[ \text{the ratio of the polysemic use of the two conjunctions [C; 'and' and 'because'] } \]
    \[ \text{the frequency of each C used in each domain / the frequency of each C} \]

3.3 Statistic analysis
Two statistical procedures were carried out stepwise, using SPSS Version 14.0J and Microsoft Excel 2002.

First, descriptive statistics were computed for the dependent and independent variables, which are summarized in Tables 2.1 and 2.2.

Second, hierarchical cluster analysis was a continuing procedure, which is evaluated as follows: it is an exploratory technique whereby the computer uncovers or profiles various grouping patterns based on the mathematical configurations and proximity by using rationalized variables (Csizer & Dornyei, 2005; Anderburg, 1973). In process, the Average linkage method between groups with the squared Euclidean distance technique was chosen because it can combine each cluster with proper cases in homogeneous diversity. Each of its dependent variables, BICS-S and CALP-S, was the rating score for oral performance, and independent variables were Breadth and Depth of conjunction use, which were standardized and transformed into \( Z \) scores.

Observing the two dendrograms obtained and the transition of coefficients in the agglomeration schedule, it could be decided that BICS-S was categorized into three subgroups and CALP-S into four. To confirm the validity of the clustering, \( t \)-tests, in place of ANOVAs, were conducted. The results are summarized and reported in Table 3.

4. Results and discussion

4.1 Analysis 1: Profiling two types of spoken text in conjunction use
Table 2.1 and Table 2.2 present an overall picture of the research data.

As can be seen in these two tables, there are salient characteristics between the two types of speaking performance. One is that the total tokens of each text, the frequency of the words which were used grammatically correctly as conjunctions, and the number of lemmatized conjunctions all showed statistically significant differences, more in CALP-S than in BICS-S (\( t = -9.192, -3.649, -6.139; p < .01 \)). This means that CALP type performance requires more utterances, with more complex information structure, resulting in more conjunction use. Also, the discourse structure, whether narrative or argumentative, affected the frequency of conjunctions. In terms of words contributing to parataxis, on the contrary, these are more often used in BICS-S than in CALP-S. The other is that CALP-S demonstrated markedly more dispersion in polysemic use of the two conjunctions: and and because.
Table 2.1

Descriptive Statistics (N=49)

<table>
<thead>
<tr>
<th>Oral Performance</th>
<th>Research Corpus</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Text</td>
</tr>
<tr>
<td>P Type</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>BICS-S</td>
<td>14.66 (2.34)</td>
</tr>
<tr>
<td>CALP-S</td>
<td>15.01 (2.31)</td>
</tr>
</tbody>
</table>

Note: Frequency means the frequency of conjunctions which are used grammatically. Kind refers to the number of lemmatized conjunctions which are used correctly and precisely.

Table 2.2

Descriptive Statistics, focusing on the ratio of Polysemic use of conjunctions (N=49)

<table>
<thead>
<tr>
<th></th>
<th>and</th>
<th>because</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N SD</td>
<td>(1-a) (1-b)</td>
</tr>
<tr>
<td>BICS-S (STN)</td>
<td>153.12</td>
<td>(11.1) (63.4)</td>
</tr>
<tr>
<td>CALP-S (STA)</td>
<td>52.06</td>
<td>(34.6) (21.2)</td>
</tr>
</tbody>
</table>

Note: The total number N means the frequency of conjunctions which are used grammatically. The other figures in parentheses represent the percentage of the conjunctions in polysemic use out of the total number.

4.2 Analysis 2: Comparison among the clusters

The results obtained from cluster analysis and cross analysis are reported in Table 3.

Table 3

Summary of Cluster Analysis and Cross Analysis (N=49)

<table>
<thead>
<tr>
<th></th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
<th>Group 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>BICS-S N (%)</td>
<td>49</td>
<td>45 (91.8)</td>
<td>1 (2.0)</td>
<td>3 (6.1)</td>
</tr>
<tr>
<td>Rating 14.66</td>
<td>14.50</td>
<td>14.4</td>
<td>12.23</td>
<td></td>
</tr>
<tr>
<td>B (Z) 4.38 (.132)</td>
<td>3.00 (-.747)</td>
<td>9.67 (2.229)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D (Z) .716 (.037)</td>
<td>.22 (.452)</td>
<td>.82 (.946)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CALP-S N (%)</td>
<td>49</td>
<td>2 (4.1)</td>
<td>21 (42.9)</td>
<td>6 (12.2)</td>
</tr>
<tr>
<td>Rating 15.01</td>
<td>18.5</td>
<td>16.34</td>
<td>16.03</td>
<td>14.17</td>
</tr>
<tr>
<td>B (Z) 8 (1.702)</td>
<td>5.90 (.554)</td>
<td>3.67 (-.848)</td>
<td>4.2 (-.498)</td>
<td></td>
</tr>
<tr>
<td>D (Z) .33 (.809)</td>
<td>.873 (.958)</td>
<td>.027 (-1.811)</td>
<td>.464 (-.382)</td>
<td></td>
</tr>
</tbody>
</table>

Note. ** p<.01, * p<.1

Table 3 highlights some distinctive characteristics of the clusters. Among the three BICS-S
cluster groups, statistically significant differences are seen in both Breadth and Depth, but no significance in OP rating scores of means. Conversely among the four CALP-S cluster groups, statistically significant or possibly significant differences are seen both in Breadth and Depth. Also, the average OP rating scores of each group show differences that were possibly significant.

General descriptions of each cluster group obtained in BICS-S are as follows: Group 1 is by far the largest of the three (N=45: 91.8%), with a slightly low dispersion both in Breadth and Depth (B=4.38, Z(B)=-.132: D=.716, Z(D)=.037). The participants in this group showed a marked tendency to use ‘and’ only for symmetrical connection or temporal succession. Group 3 is extremely small in size, but highly unique, which showed double-dispersion in Breadth (B=9.67, Z(B)=2.229), only to show very low OP rating scores. This demonstrates the inefficiency of conjunction use in combining clauses, or developing information conveyed. At the same time, perusing the concordance revealed that one of the cases showed strong L1 interference and this participant’s bidirectional way of thinking between L1 and L2 slowed down the fluency and speaking speed. However, this participant delivered an excellent CALP-S output, which can lead to an interpretation that this case is an extreme example, when one’s personality, history of learning EFL, or experience of using the target language has a decisive influence on one’s interpersonal communication. All the other cases in this group showed excellent performance. It can be said that this group demonstrated that the variety in the conjunction use is a reference mark of good English.

Next are CALP-S cluster groups. Group 1 is a very small cluster in size (N=2, 4.1%), with some dispersion of Breadth and a slight dispersion in Depth of conjunction use (B=8, Z(B)=1.702: D=.33, Z(D)= -.809). Examining the two cases qualitatively revealed some characteristics: (a) no because, (b) and used only for temporal succession, and (c) very high efficiency in OP. Between Group 2 and 3, Breadth and Depth showed statistically significant differences, and the average OP rating scores were possibly significant, all of which are superior in Group 2 to those in Group 3. Group 4 is quite a large cluster (N=20, 40.8%), with much dispersion in Breadth and a lower OP score. Another qualitative examination on this group found a small sub-cluster of three cases. All participants in this subgroup tended to use too many conjunctions, which caused too much complexity in discourse and less efficiency in performance. After eliminating these cases, this group yielded some data approximate to the others.

In the case of CALP-S, unlike BICS-S, Breadth showed some significant contribution to information development in discourse and performance effectiveness. Depth did not prove to be as good as an explanatory variable as expected in terms of the quality of performance. As such, two types of speaking performance were explained differently by the two indices of conjunction use.

4.3 Analysis 3: Comparison between two types of Speaking

To consider the developmental stages of the two, BICS-S and CALP-S through comparing the explanatory relationships by the two indices, all the data were illustrated in Figure 1.
Figure 1 shows a distinctive difference between the two types. BICS-S seems to have very slight explanatory relationships between performance efficiency and the variety of conjunction use. The oral performance tests did not request the participants to output so long utterances, even if it was of a monologue type, and to narrate a story provided by stimuli, drawn in a four-frame cartoon. Presumably, the participants can speak well enough to continue, making good use of coherence in the discourse, without using too many conjunctions. On the other hand, CALP-S was explained more strongly by Breadth. Depth also showed a significant explanation for CALP-S for the most part. However, the highest group of CALP-S was not explained by Depth conjecturally. It can be said that the commonalties of this group made the best use of a variety of conjunction, because they would use more automatized rules of grammatical knowledge or grammar-like structure on automatic performance level, which is more highly cognitively demanding.

As a consequence of the discussion above, it can be concluded that the developmental processes of Breadth and Depth on a spontaneous production level are different. Taking it into consideration that all of the participants are typical Japanese EFL learners, it can be summarized that they acquire various conjunctions through four-skilled integrated communication activities at comparatively early stages of learning English, then depth or polysemic use of conjunctions through various types of reading centered activities over a long period of time. They, at the same time, acquire cognition which should be a constituent of a L2 speaking ability, CALP-S.

5. Conclusion

In spite of a limitation, or the small corpus size (N=49), the sample, which was obtained through multi-stratified sampling, was sufficiently homogeneous to analyze statistically, using a corpus based technique. These major findings proved to answer all the research questions from
RQ1 to RQ3 and to verify the research hypothesis, in part to support Cummins’ Hypothesis. It can be concluded that BICS-S and CALP-S are very different types of speaking ability in explanatory structure in two dimensional view of conjunction use. Furthermore, each of them is acquired through different processes. Further research should be conducted in order to examine the cognition rather strongly contributing to CALP-S and to develop an approach appropriate for learners to improve such cognition efficiently through using the target language.

References