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ABSTRACT

A study investigated whether markedness relationships within a target language influence the degree of difficulty in acquisition. The Intralingual Markedness Hypothesis was developed, stating that if structures in the target language differ from those in the native language, and if those structures in the target language are in a markedness relationship, the more marked structures will be more difficult to acquire than the less marked structures. Fourteen adult native speakers of Spanish each read aloud 435 topically unrelated sentences, each containing one of three target onsets ("sl, sm, sn") not found in Spanish. Degree of difficulty was measured by the frequency of epenthesis before the onsets. Statistical analysis of results revealed that the mean frequency of epenthesis before "sl" was significantly lower than that before the other two, supporting the Intralingual Markedness Hypothesis. A brief bibliography and a brief list of sentences from the study are appended. (MSE)

The Effect of Markedness on Epenthesis in Spanish/English Interlanguage Phonology

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THE EFFECT OF MARKEDNESS ON EPENTHESIS IN SPANISH/ENGLISH INTERLANGUAGE PHONOLOGY

Robert S. Carlisle

The purpose of this study was to determine if markedness relationships within a target language influence degree of difficulty in acquisition. To test this possibility, the researcher developed the Intralingual Markedness Hypothesis. For the hypothesis to be tested the target language must have structures not in the primary language, and those same structures must be in a markedness relationship. Both conditions are satisfied in the case of native Spanish speakers learning English because English has three onsets--.sl, .sm, and .sn--that are not found in Spanish and that are in a markedness relationship.

Fourteen native speakers of Spanish each read 435 topically unrelated sentences each containing one target onset. Degree of difficulty was measured by the frequency of epenthesis before the onsets. Statistical analysis revealed that the mean frequency of epenthesis before .sl was significantly lower than that before both .sm and .sn. The results failed to falsify the Intralingual Markedness Hypothesis.

INTRODUCTION

Researchers in second language acquisition have long recognized that the Contrastive Analysis Hypothesis as traditionally formulated cannot predict phonological errors produced by L2 learners. Evidence for this lack of success comes from research on segments demonstrating that some segmental variants produced by learners are found neither in the target language nor in the learners' own native language (L. Dickerson, 1975). Further evidence comes from research on the syllable revealing that second language learners modify syllable structure in the target language even though the the same syllable type exists in the native language (Tarone, 1980).

Despite this evidence against the Contrastive Analysis Hypothesis, Eckman asserts that it still "can be maintained as a viable principle of second language acquisition" (1977, p. 315) if revised to incorporate principles of linguistic universals, specifically typological markedness. The result of the merging of the Contrastive Analysis Hypothesis and typological markedness is the Markedness Differential Hypothesis (Eckman, 1977, p. 321):

(1) Markedness Differential Hypothesis (MDH)

The areas of difficulty that a language learner will have can be predicted on the basis of a systematic comparison of the grammars of the native language, the target language and the markedness relations stated in universal grammar, such that,

(a) Those areas of the target language which differ from the native language and are more marked than the native language will be difficult.

(b) The relative degree of difficulty of the areas of the target language which are more marked than the native language will correspond to the relative degree of markedness.

(c) Those areas of the target language which are different from the native language, but are not more marked than the native language will not be difficult.

According to Eckman, the incorporation of typological markedness into the Contrastive Analysis Hypothesis provides a needed "degree of difficulty" (p. 320) which will enable researchers to predict the direction of difficulty for the acquisition of those structures within markedness relationships. The concept of direction of difficulty is clear from (a) and (c) of the MDH; if a markedness relationship exists between two languages such that language A has the marked structure and language B does not, then speakers of B learning A should have more difficulty with that structure than should speakers of A learning B.

One of Eckman's examples demonstrating this direction of difficulty is from German and English. In English, a voicing contrast of obstruents occurs in word-initial, word-medial, and word-final positions. However, in German this voicing contrast occurs only in initial and medial positions, the contrast being neutralized in final position. Evidence from other languages indicates that there is an implicational relationship in the distribution of voicing contrasts. Some languages--Arabic and Swedish--maintain a voicing contrast in all three positions; others--Greek and Polish--maintain a voicing contrast in initial and medial positions; and still others--Corsican and Sardinian--have the contrast in only initial position. Consequently, a voicing contrast in final position implies a voicing contrast in medial and initial positions, and a voicing contrast in medial position implies a voicing contrast in initial position whereas the converse is not true.

Such an implicational pattern reveals that a voicing contrast in initial position is the least marked contrast, and a voicing contrast in final position is the most marked contrast. This implicational relationship means that the distribution of the voicing contrast is marked in English relative to German as English preserves the contrast in final position. Thus, according to the MDH, German speakers learning English should have more difficulty realizing the word-final voicing contrast in English than English speakers learning German should have neutralizing the contrast in German. According to observations made by Moulton (1962) of German speakers learning English and English speakers learning German, the MDH would successfully predict the direction of difficulty exemplified above.

The MDH has been tested on consonant clusters between English, the target language, and a number of primary languages all of which had more simple clusters than did English or which did not allow clusters at all (Anderson, 1987). Because the clusters in the primary languages were more simple than those in English, and because markedness increases with the length of the cluster, the conditions for testing the MDH were met, and Anderson hypothesized that subjects would modify longer clusters more

frequently than they would shorter clusters. Statistical analysis failed to falsify the MDH in the study.

THE PROBLEM

Even though the MDH takes markedness relationships between the target language and the native language into account, it does not do so with markedness relationships within just the target language. It is important to take such relationships into account if the full effect of markedness on second language acquisition is to be understood. For example, as Greenberg (1965) has pointed out, there is an implicational relationship between two member onsets consisting of a liquid followed by an obstruent (LO) and an obstruent followed by a liquid (OL). Some languages such as Czech, Georgian, and Polish have both types of onsets. Others such as French, Greek, and Hindi have OL onsets, but not LO onsets. No language has LO onsets unless it also has OL onsets. Thus, onsets of the form OL are less marked in relation to those of the form LO. The MDH predicts that speakers of languages having OL onsets, but not LO onsets, will have difficulty acquiring LO in a second language having both types of onsets. However, the MDH makes no prediction whatsoever about the following case. Some languages such as Santee, Delaware, and Quileute have two member onsets, but none of the form OL or LO. The MDH can make no prediction about the speakers of one of these languages trying to acquire a language such as Polish which has both OL and LO onsets. The reason that the MDH cannot make predictions in this case is that no onset exists in Santee, Delaware, or Quileute which is in a markedness relationship with OL or LO onsets. The MDH makes predictions only if a structure in the native language is in an implicational relationship with a structure in the target language. If the native language is one that does not have either one of these onsets and the target language is one that has both, then the markedness relationship is not between the native and the target language, but rather entirely within the target language.

PURPOSE AND HYPOTHESIS

The purpose of the current study is to examine the effect of markedness on second language acquisition. However, unlike the MDH which examines markedness relationships between the native and the target language, the hypothesis designed for this study examines markedness relationships within only the target language. A hypothesis which can be used to test the possible effect of markedness as expressed in the implicational patterns within the target language appears in (2) below:

(2) Intralingual Markedness Hypothesis (IMH)

> If structures in the target language differ from those in the native language, and if those structures in the target language are in a markedness relationship, then the more marked structures will be more difficult to acquire than will the less marked structures.

For the Intralingual Markedness Hypothesis to be tested, two conditions have to be fulfilled. First, certain structures in the target language have to differ from those in the native language; and second, these same structures in the target language must be in a markedness relationship.

Both conditions are satisfied in the case of Spanish speakers learning English because English has three onsets--.sl, .sm, and .sn--that are not found in Spanish and that are in a markedness relationship (in this paper onsets are denoted by a period to the left).

CONDITIONS FOR TESTING THE IMH

Onsets in English and Spanish

According to recent theoretical statements on the structure of syllables, especially by Clements and Keyser (1983), every language has syllable structure conditions which define the well-formed onsets of the language (for the purpose of this paper only two-member onsets will be discussed). Clusters not defined by the syllable structure conditions are impossible onsets which native speakers of the language cannot pronounce as tautosyllabic sequences and which cannot occur in underlying representation.

The syllable structure conditions of English define a large number of two-member onsets, at least 30. Among these onsets are seven of the form .sC (where C may stand for any permissible consonant) including .sw, .sl, .sp, .st, .sk, .sn, and .sm.

In contrast, the syllable structure conditions of Spanish, as inferred from the work of Harris (1983), define only 12 two-member onsets, none of which are of the form .sC. Thus, .sl, .sm, and .sn are impossible onsets in Spanish, and they cannot occur in underlying representation.

The syllable structure conditions of Spanish are a primary motivation for a rule of epenthesis. Spanish has a large number of words such as escuela, estampa, and espia in which the word-initial vowel is entirely predictable and consequently inserted by phonological rule. Because the rule applies during the derivation of the word, the underlying representation of the beginning of escuela, for example, might be thought to be /sk/. However, /sk/ is a prohibited tautosyllabic sequence which cannot occur in underlying representation according to the syllable structure conditions of Spanish. Therefore, in underlying representation the initial /s/ must be an extrasyllabic consonant. Because extrasyllabic consonants cannot appear on the surface, Spanish has a rule of epenthesis inserting a vowel which acts as a syllabic nucleus to which the extrasyllabic consonant resyllabifies before reaching surface representation.

Recent research (Carlisle, 1983) examining Spanish speakers' use of vowel epenthesis before English words beginning with .sp, .st, and .sk demonstrates that both the syllable structure conditions of Spanish and the rule of epenthesis are part of the interlanguage of Spanish speakers learning English, at least at the beginning and intermediate stages of acquisition. That is, Spanish speakers treat English words beginning with .sp, .st, and .sk as having initial extrasyllabic consonants, and they variably insert a vowel before them, the frequency of insertion being inversely proportional to the sonorancy of the environment preceding the onset. For example, Spanish speakers are much more likely to insert a vowel before .sp in a sentence such as The cat spotted the bird than before .sp in The sportscar is expensive because the environment before .sp in the

former sentence is much less sonorant than the one in the latter sentence.

In this brief section it has been demonstrated that the syllable structure conditions for English do define onsets--.sl, .sm, and .sn--not found in Spanish. Thus, the first condition for testing the Intralingual Markedness Hypothesis has been fulfilled. It has also been demonstrated that the syllable structure conditions of Spanish motivate a rule of epenthesis, a rule that applies variably in interlanguage and is the major strategy that Spanish speakers have for modifying .sC onsets in English (Carlisle, 1983, 1985). To test the hypothesis one last condition must be fulfilled: The three onsets--.sl, .sm, and .sn--must be in a markedness relationship.

Onsets and Markedness

In a paper cataloguing 40 linguistic universals involving word-initial and word-final consonant clusters, Greenberg (1965) asserts that .sl is less marked that .sm and .sn, the assertion being based on evidence from 90 languages. According to the findings of the research, 50 languages have word-initial consonant clusters consisting of both obstruent + liquid (OL) and obstruent + nasal (ON); 25 other languages have OL clusters, but not ON clusters; 14 languages have neither word-initial cluster; and only one has a ON cluster without having a OL cluster. (Though appearing exceptional, this last language is really not as it lacks a liquid in its phonology). The above evidence clearly demonstrates that the OL cluster is less marked than the ON cluster as the presence of the latter implies the presence of the former whereas the converse is not true.

The conditions of the Intralingual Markedness Hypothesis having been fulfilled, the hypothesis under study took the following specific form: Given that English has onsets of the form .sl, .sm and .sn which Spanish does not, and given that .sl is less marked than .sm and .sn, Spanish speakers will have less difficulty acquiring .sl than either .sm or .sn. Difficulty of acquisition will be measured by the frequency of epenthesis before each onset.

The hypothesis presented in the previous paragraph has been tested once before. In a pilot study, Carlisle (1985) examined the frequency of epenthesis used by nine native Spanish speakers before English words beginning with .sl, .sm and .sn. The results of the study revealed that whereas the frequency of epenthesis before .sl was significantly lower than that before .sm, it was not significantly lower than that before .sn. However, the difference in frequency before the two onsets did approach significance, and the frequency of epenthesis was in the correct direction as seven of the nine subjects did have a lower frequency of epenthesis before .sl than before .sn.

METHODOLOGY

Subjects

The subjects in the current study were fourteen native Spanish speakers from Colombia, Mexico, and the Dominican Republic. An equal number of males and females participated in the study. All subjects were adults.

Elicitation Device

The elicitation device was a list of 435 topically unrelated and randomly ordered sentences, 145 sentences each for .sl, .sm, and .sn printed on 21 sheets of paper. (See Appendix for examples of the sentences). Each sentence contained only one word beginning with any of the target onsets. As the environment preceding .sC is known to affect the frequency of epenthesis (Carlisle, 1983), it was mandatory to create a device containing the same environments occurring the same number of times before each of the three target onsets. Thus, 28 segmental environments and silence occurred five times each before .sl, .sm, and .sn.

Data Gathering Procedure

Each subject read all the sentences on the elicitation device in a single sitting, most subjects completing the task between 12 and 15 minutes. Before each subject read, the researcher reordered the sheets to prevent any ordering effect. All the subjects read and were recorded in a soundproof booth.

Transcribing and Reliability

In the current study, the absence and presence of the epenthetic vowel was noted as well as any other phonetic modifications of the target onsets such as the deletior of /s/. The researcher transcribed the tapes at one time, and a second rater with experience in this type of research independently transcribed the tapes at another time. Initial inter-rater correlations on the tapes of the 14 subjects ranged between .826 to .927. The two raters then together listened to all of the items on which they had disagreed, and if either felt that the original observation was erroneous, it was changed. After this reevaluation, the inter-rater correlations ranged between .906 and .993. Any items on which the raters did not agree after the second evaluation were removed from the study, a total of 273; also removed were any incomprehensible sentences or ones that the subjects obviously misread in such a way that the hypothesis could not be investigated, a total of 161 sentences. Of an original 6090 sentences, 5656 remained for the statistical analysis.

Analysis

Two types of statistics were performed on the data: correlations of the frequency of insertion before all three onsets and an ANOVA to test for differences among the mean frequencies of insertion before the three onsets.

RESULTS

The correlations between the pairs of onsets were high: .965 between .sl and .sm; .992 between .sl and .sn; and .978 between .sm and .sn. All correlations were significant beyond ($p<.0001$). The mean frequencies of epenthesis before the three onsets were .287 for .sl; .377 for .sm; and .328 for .sn. The ANOVA was also significant; $F(2, 41) = 106.31$, $p<.0001$. Tukey pairwise comparisons set at $p<.05$ revealed that the means of .sm and .sn were both significantly larger than the mean for .sl, and the mean of .sm was significantly larger than the mean of .sn.

DISCUSSION

To begin with, the results of the correlational analysis revealed that subjects who used epenthesis frequently before one onset also used it frequently before the other two onsets. These correlational results agree with those of the pilot study (Carlisle, 1985).

The results of the analysis of means failed to falsify the Intralingual Markedness Hypothesis as the mean frequency of epenthesis was significantly higher before both .sm and .sn than before .sl. It thus appears that markedness relationships within a target language are valid predictors of degree of difficulty in second language acquisition. One finding of the current study corroborated a finding of the pilot study: Epenthesis was significantly more frequent before .sm than before .sl. However, unlike the pilot study the current study also produced a significant difference between .sn and .sl. Because the sample size was larger in the current study than in the pilot study, the present results must be considered more valid of the differences between the onsets involved.

Both the pilot study and the present study produced what appears to be an aberrant finding; the difference in frequency between .sn and .sm was significant even though the two onsets are not in a markedness relationship. Although the finding might at first appear to falsify the Intralingual Markedness Hypothesis, it does not. The hypothesis only makes predictions for structures that are in a markedness relationship with each other. In the current study .sn is in such a relationship with .sl as is .sm. However, .sm and .sn are not in a markedness relationship with each other, so no prediction from the hypothesis can be made.

CONCLUSION

The findings of the current study help to at least partially explain a well documented feature of interlanguage phonology: its variability. Previous studies have shown that phonetic environment influences the frequency with which different variants of a variable occur (W. Dickerson, 1976; Carlisle, 1983). However, these studies were designed to reveal the presence of variability in interlanguage phonology, not necessarily to explain why some phonological structures are modified less frequently than others. From the current study, it appears that one factor involved in explaining such differences in the frequency of modification is the presence of universal markedness relationships within the target language: Less marked structures are less frequently modified than are more marked structures. Consequently, if one goal of research in interlanguage phonology is to explain variability, rather than just reveal it, a hypothesis such as the Intralingual Markedness Hypothesis becomes a requirement.

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APPENDIX

I want to keep slim.
The carpenter smoothed the wood.
Doug smokes too much.
George Washington had smallpox.
It has snowed for two days.
She stirred the hash slowly.
We have some smart students.
Smut is dirty language.
The ice slid along the table.
Rob smiles a lot.
I love sledding.
I slimmed down.
They loathe snow.
They smoke too much.
He drank the rum slowly.
The train slowed to a stop.
The lion snarled.
We will have some smog tomorrow.
My smoking bothers him.
The art teacher bought some smocks.
It snowed yesterday.
The house smells bad.
She is still slender.