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ESL spelling errors: a taxonomy

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ESL spelling errors: A taxonomy

by

Lee Stanley Tesdell

A Thesis Submitted to the
Graduate Faculty in Partial Fulfillment of the
Requirements for the Degree of
MASTER OF ARTS

Major: English
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A Brief History of the Spelling Problem in English</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>ESL Students and Spelling</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>The Need for Research into ESL Spelling</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Goal of the Study</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Review of the Literature</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Summary of the Literature</td>
<td>13</td>
</tr>
<tr>
<td>3</td>
<td>Profile of Subjects</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Data Collection</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>Predictions</td>
<td>19</td>
</tr>
<tr>
<td>4</td>
<td>Prediction Results</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Other Findings</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Qualifications of Findings</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Conclusions: Implications for Further Research and Pedagogy</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>List of Works Consulted</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>Appendix</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>Acknowledgements</td>
<td>41</td>
</tr>
</tbody>
</table>
LIST OF TABLES

TABLE 1. Error percentage means for four languages ... 22
TABLE 2. Mean number of errors for four language groups 23
TABLE 3. Error position means for four languages ... 25
TABLE 4. Error type means for four languages ... 26
TABLE 5. Error category means for four languages ... 27
TABLE 6. Michigan score and age means for four languages 28
TABLE 7. Sex of the subjects by language ... 28
CHAPTER ONE

In this chapter, the history of the spelling problem in English is traced, the importance of spelling for English as a Second Language (ESL) learners is stressed, the need for research into the spelling of speakers of other languages is stated and the goal of the present study is presented.

A Brief History of the Spelling Problem in English

We have seen that for more than a century English spelling has been recognized as the chief obstacle to the spread of English as the predominant international second language of the world.... (Dewey 1971, p.89)

Now, in the 1980s, English has indeed become the world's second language. Yet, American English (AE) spelling remains an obstacle, although probably not the insurmountable one Dewey suggested. The source of the problem seems to lie in the ambiguity of some letter-to-sound correspondences. Such words as "sign", "sigh", and "signal" for instance, all contain the letter "g" but in each case that letter has a different phonetic value.

The source of the ambiguity in AE spelling lies in its history. Etymologists point out that words and their spelling originated in more than one language. "Gnome" is of Greek origin, for example, while "listen" is of Anglo-Saxon origin, "debt" is of Old French origin and "psychology" is of Latin origin.
The English spelling system is about 1500 years old. Perhaps the period during which the language underwent most change was at the end of the Middle English Period (1100-1500 AD). At this time several changes took place which influenced the spelling system. First, the Great Vowel Shift occurred which changed the pronunciation of some vowels and diphthongs. For instance, "wine" had been pronounced like today's "wean". The problem was that while the pronunciation changed, the spelling did not. As a result AE uses a spelling system which is older in some cases, than the phonetic system.

While the Great Vowel Shift occurred in English, it did not in French, Italian and Spanish. This means that vowel sounds which may have been represented by the same letter in all four languages (especially Latin cognates) are now spelled differently in AE.

A second change in English was the dropping of the pronunciation of the diacritic "e". Such words as "name" and "dance" were two syllable words before the change. This change also affected words like "stored" and "laughed" which became one syllable words.

Finally, the printing press introduced into England in 1475, served to standardize English spelling and make changes in the spelling system more difficult than before. These are some of the historical reasons for difficulty in
the AE spelling system. ESL students sometimes complain about the difficulty of the AE spelling system, but as Irmscher points out, "Millions of people have mastered the English spelling system. It is not beyond the abilities of most educable people" (1979, p.126).

ESL Students and Spelling

However difficult or irrelevant the ESL student may regard spelling, good spelling is a part of good writing. The following letter written to an admissions officer illustrates the negative impact poor spelling can have on the reader:

I am a private student, I study on my own. I am supported by my father... my money is not sent to me in certain amounts regularly, I receive it when I request it, depending on the tuition of school and expenses. At the present time, I am applying for a scholarship from... I have all the requirements except an acceptance from four year university, that applies an industrial engineering curricula, such as your university, and that explains item #15 in the information sheet for international student form of the application. I have more than three years background in the proficiency of English. I have a certificate from... to indicate my proficiency. I have completed all the levels required, and should require no addition course work in English as a second language. And my English proficiency is adequate for university level curricula. That certificate included with the application forms.
The Need for Research into ESL Spelling

An examination of the recent literature on teaching English as a second language (TESL) will reveal that spelling is not a common subject of research. Mina Shaughnessy (1978) writes of spelling:

It is the one area of writing where English teachers themselves will admit ineptness. Perhaps this is one reason that little research has been done on the subject. Shaughnessy goes on to write that an error classification system needs to be developed so that the errors of Basic Writers (BW) can be analyzed. As Shaughnessy points out, there is both an inadequate amount of information about spelling errors available and a strong need to do detailed studies about them. This situation exists in ESL research as well. The literature reveals almost nothing about the nature of ESL spelling errors. As a result, there is almost nothing on which to base our pedagogy regarding ESL spelling.

While there are few studies in the literature on ESL spelling errors, studies on the spelling errors of native speakers are more common. Such recent publications as Uta Frith's *Cognitive Processes in Spelling* 1980, show that there is strong interest among reading and psychology researchers in spelling errors. There is no such publication for ESL spelling research.
Spelling is a perennial problem in the writing of ESL students, but in order to treat these errors the teacher needs to have information about the nature of the spelling errors their students make.

As yet, however, many basic questions about ESL spelling remain unanswered. Do learners with one mother tongue spell differently in English than those from other language groups? Do all ESL students have difficulty spelling the same words? Are errors more likely to occur in certain positions than in others? Are vowels more likely to be misspelled than consonants? Are ESL students more likely to omit letters than to add letters? Are ESL students likely to try to avoid spelling words of which they are unsure? Are the spelling errors of first language learners similar in any way to those of second language learners? Until these and other basic questions about the nature of spelling are answered, teachers' problems will remain unsolved.

Goal of the Study

This study attempts to construct a taxonomy of the spelling errors of a group of ESL students so that ESL researchers and teachers might begin to understand those errors and subsequently understand how best to help students with their spelling problems. It is intended to be a
replicable study. For this reason, the appendix contains the entire error index. It is hoped that other studies will be made similar to this one but on the spelling errors of students at other proficiency levels and perhaps from other language groups.
CHAPTER TWO

In this chapter, literature relevant to the present study is reviewed. Research on both native and non-native spelling errors is analyzed.

Review of the Literature

There is a handful of published studies concerned with the analysis of spelling errors. Some of these studies were conducted on the errors of native speakers, others on the errors of ESL students. The studies which precede the present one have little in common with each other however, other than their interest in spelling errors.

Two separate methodological influences have shaped the spelling studies under consideration. The first is the contrastive analysis (CA) hypothesis which maintains that the second language learning errors a student makes can be predicted by determining the differences between the first and second languages. The areas of most difference are predicted to be the areas in which the student will have most difficulty learning the target language. Subsequently, two variations of CA have been proposed; a weak version and a moderate version.

The weak version claims that errors can be better explained a posteriori rather than a priori as the strong version suggests. Wardhaugh (1970) proposed that this
observational rather than predictive application of CA is more useful.

A moderate version has been advocated by Oller and Ziahosseiny (1970) who found that neither the strong nor the weak version explained their findings in a spelling study. Their data showed that ESL learners may have most difficulty spelling the second language at the points where the spelling differences between the first and second language are subtle.

The second theory, error analysis (EA), does not stress the difference between the first and second languages. Instead, EA maintains that a study of the interlanguage (the learner's own linguistic bridge between the first and second languages) will yield useful information about language learning. Corder (1967) and others have suggested that errors from all sources, not only negative transfer from the first language, be considered. EA advocates stress that not all errors students make are attributable to the first language.

A qualification was added to the EA hypothesis by Schachter (1974). She pointed out that a student can not be assumed to know how to produce a certain language item correctly if he/she does not produce it. In fact, that student may be avoiding trying to produce it for fear of making an error. Thus, the notion of avoidance strategy
adds an important qualification to the EA hypothesis. Researchers agree however, that the study of ESL students' errors is a valuable source of information. According to Dulay, Burt and Krashen (1982) studying the errors of ESL students serves two purposes. First, the data it provides leads to inferences about the nature of the language learning process. Second, errors indicate which areas of the target language are difficult and which error types detract most from a learner's ability to communicate effectively.

Both CA and EA have been applied to spelling errors studies. In most of the following spelling error studies, EA has been utilized. Oller and Ziahosseiny, however, propose a moderate CA hypothesis.

Oller and Ziahosseiny (1970) conducted the first known study on ESL spelling errors. They predicted the usefulness of a version of CA and then examined the spelling errors of 158 students whose language used a Roman alphabet. They also examined the spelling errors of 198 students whose native language did not use a Roman alphabet. They found that students in the first group made fewer errors overall, but more spelling errors. This result corroborated the moderate version of the CA hypothesis; that subtle differences in spelling systems will lead to more spelling errors than obvious differences between spelling systems.
A second study, by Wyatt (1973), reported the writing errors of 52 secondary level ESL students. His purpose in conducting the study was to determine which writing errors needed remediation. Spelling errors represented the largest single group of errors. Of the errors, spelling was found to be the highest percentage; 18.4% of the total. Wyatt classified the spelling errors into six categories. He found the most common error to be vowel misspellings (4.9%). The author claimed that the students he tested were of average English language proficiency for his school.

A third study, by Sally (1976), is notable for its pedagogical implications rather than its findings. Sally determined that the students in this class in Sri Lanka could improve their spelling dictation after following a six step improvement course. The errors were not classified in this study, but rather used to locate the spelling difficulties the students had. The remedial spelling program was based on correcting those particular misspellings.

A fourth study, by Ibrahim (1978), analyzed the spelling errors of undergraduates at the University of Jordan. He classified the errors based on cause rather than type. His conclusions about error source are sometimes arbitrary, as he admits. This is due, he writes, to the
lack of experimental evidence about error cause.

While studies on the spelling errors of ESL students have differed in their approaches and purposes, much of the research on native speakers' spelling errors has concentrated on studying differences across the dialects of English. Mina Shaughnessy (1978) remarks that:

Most students, whether they started out speaking Chinese or BEV [Black English Vernacular] or Navajo, seem to end up in freshman English with a common stock of errors ....

She finds this to be true because of the inherent difficulties with "some parts of formal English" which even native speakers face.

In an earlier cross-dialect study, Kirschner and Poteet (1973) found that the writing of remedial college students did not show a significant difference:

in the type and frequency of non-standard English usage between black, white, and Hispanic students.

In a third study, Desberg, Elliot and Marsh (1980) conclude that the data which suggest that Black English (BE) dialect interferes with the students spelling is "at best suggestive."

All three of these studies showed that though spoken language differences abound between these groups, written language differences, especially in spelling, are less common. This would tend to support the EA hypothesis.

Finally, while not directly relevant to the questions
of CA vs. EA, one recent study has added a great deal to our knowledge concerning the errors of native-speakers of English, particularly in developing a taxonomy for those errors. As such, it was the primary model for the present study. The study, done on errors in the examination papers of candidates for admission to Cambridge University by Wing and Baddeley (1980), classified and analyzed errors according to error position and error type. The subjects in the study were 40 native speakers of British English. The authors of the study hypothesized that examining the spelling errors in their subjects' handwriting might provide some clues to the underlying psychological processes. In that connection, they predicted that spelling errors would tend to be more numerous at the ends of words rather than the beginning or center. They believed that as the writer progresses through the word, the memory which stores the spelling of the word weakens, therefore producing progressively more misspellings in the word. Their hypothesis was disproved, however, and they found instead that errors were most likely to occur in the medial position. Their explanation for this finding was that the beginnings and ends of words serve as markers for spelling so we remember how to spell them better than we do the medial letters.

Wing and Baddeley make important distinctions
concerning slips and convention errors which I have also incorporated into my own study. The authors define a slip as a corrected error and a convention error as a real mistake. However, they point out that it is possible for them to have misclassified some slips. After all, if a student uses a word only once, and misspells it, it may or may not have been a slip.

Another major contribution of the Wing and Baddeley study is their emphasis on spelling error data. They furnish their own error list of over one thousand errors classified according to slip or convention error and student. The authors indicate that one of the problems in spelling error research is that error rates are quite low. According to Chedru and Geschwind (1972), 1.1% of the words spelled by native speakers have at least one misspelling in them. The authors point out that data from an error list in which the error percentage is higher than normal for average English speakers might prove useful for analysis. This would be useful in order to look for significant error patterns in misspellings. ESL students' compositions are one possible source for this higher error rate.

Summary of the Literature

Despite the common subject of analysis, the studies mentioned above differ fundamentally on several grounds.
First, the number of subjects varied widely. Oiler and Ziahosseiny (1970) examined 356 papers, Wyatt (1973) looked at 52, Sally (1976) at 37 papers. Ibrahim (1978) does not report the number of his subjects. Wing and Baddeley studied the errors of 40 students.

Second, of the spelling studies, three looked at the errors of only one language group. Wyatt did not report the language of his students though it was, apparently a language of Uganda. Sally's students spoke Sinhala, a language of Sri Lanka. Ibrahim's students were Arabic speakers and Wing and Baddeley's were British English speakers. In the case of Oiler and Ziahosseiny's study, spelling errors from a large selection of students were analyzed. Although they report error rates of non-Roman and Roman spelling system languages, they do not report how many of which languages were analyzed.

Third, language proficiency level of the subjects was not clearly indicated in any of the studies. A general skill level can be ascertained from other information in the studies. Oiler and Ziahosseiny's subjects had all been accepted as students at UCLA, as the spelling errors were gleaned from the fall 1969 ESL placement examination. Wyatt's students were enrolled in St. Joseph's College in Layibi, Uganda, a secondary school. The errors he analyzed came from written work done over a period of four terms.
Sally's students were G.C.E. "O"-level students between the ages of sixteen and eighteen. Ibrahim reports only that his students were undergraduates enrolled in English classes at the University of Jordan. In the case of Wing and Baddeley's study, the students were secondary school graduates writing their entrance examinations for Cambridge University.

A difference also appears in the literature on the subject of method of collection of errors. The UCLA study and Sally's study collected errors from dictation tests. On the other hand, Wyatt, Ibrahim, and Wing and Baddeley all collected their data from freely written compositions.

Perhaps the most important issue to be considered is that of error analysis taxonomy; Oller and Ziahosseiny looked at only two categories: gross spelling errors and gross non-spelling errors. Wyatt's study broke the spelling errors down into five categories: vowel, double vs. single consonant, other consonantal, omission of one letter, addition of one letter and 'other'. Sally was interested only in gross spelling errors for the purpose of writing a remedial spelling program for the students. Ibrahim categorized errors into seven groups: errors caused by non-phonetic nature of English spelling, errors caused by differences between English and Arabic sound systems, errors caused by arbitrary English word derivation, transitional
errors, errors caused by differences between American and British spelling systems and an 'other' category. Wing and Baddeley used a positional analysis to determine the position of the error in the word and in the sentence. They also categorized their errors on the basis of the mutually exclusive error types; omission of a letter, substitution of one letter for another, insertion of a letter and reversal of letters. It should be noted that errors were analyzed from differing angles in the above studies. While Oller and Ziahosseiny and Sally were interested only in gross error rates, Wyatt and Wing and Baddeley looked at error from the point of view of kind of error made. Ibrahim looked at the cause of the error. Categories of error were not always mutually exclusive in the above studies. It was possible, for instance, in Wyatt's study for a given error such as children/children to be classified as both a vowel and an omission type of error.

Although each of the studies reviewed here offers interesting observations of spelling errors, none of them offer a comprehensive look at the problem. In order to present the most useful ESL spelling error analysis, certain aspects of the above studies were utilized in the present study.

Wing and Baddeley introduced several classifications which proved valuable for the present study. They
differentiated between slips and errors of convention (habitual errors or real mistakes). Slips were defined as errors which were corrected elsewhere in the composition. They also adapted a system from Chedru and Geschwind (1972) to arrive at error type: omission, substitution, insertion and reversal, but more interestingly, their distributional analysis added a new tool to spelling error analysis. This positional analysis allows for the division of any word into five parts. For the purposes of this study, three positions were reported; initial, medial and final, as did Wing and Baddeley. These three components of error classification with the addition of four determinations of error category; vowel, consonant, homonym and other, make a detailed analysis of spelling errors possible in the present study.

In conclusion, there are two clear needs in ESL spelling research. One is the necessity for precise presentation of data and methodology so that studies can be replicated and the other is for studies to be made at other proficiency levels and with other language groups. The present study attempts to meet these needs.
Chapter Three describes the subjects in the study, method of data collection and predictions based on previous studies.

Profile of Subjects

Compositions written by 56 international students from four language groups commonly represented on U.S. university campuses were examined for spelling errors. There were 9 Arabic speakers, 10 Chinese speakers, 20 Malay speakers and 17 Spanish speakers. Students' first languages were checked closely. Chinese speakers who live in Malaysia were not included in the data because of the possible influence of Malay on their first language, for example. All of the students scored between 80 and 89 (inclusive) on the Michigan Test of English Language Proficiency on tests taken within a few days of their writing the compositions. All were enrolled in academic classes at Iowa State University at the time of the data collection, having previously scored at least 500 on the Test of English as a Foreign Language (TOEFL) in order to gain admission to Iowa State University. Thus, the subjects in this study can be described as relatively advanced in their study of English.

These subjects were used because they represent major language groups at U.S. colleges and universities and
because the university considers them ready to compete academically with native speakers.

Data Collection

The compositions were each written in 30 minutes on one of two topics, either: "The effects of modern technology on my country" or "The most difficult problems facing my country." Only one composition was used from each of the 56 students. The compositions were selected from a larger sample collected by Dr. Janet Anderson and the ESL program faculty at Iowa State University. The Webster's New Collegiate dictionary was used as the final authority for the spelling of words.

Predictions

The following predictions were tested using the data collected in the present study. First, ESL students will have a higher rate of misspellings than native speakers of English. For native speakers, the letter error rate has been found to be less than .10% (Van Nes) while the word error rate has been found to be 1.1% in native speakers (Chedru and Geschwind). Based on my earlier pilot study, ESL students should exhibit a substantially higher word error rate than 1.1%.

Second, slips will not be more numerous than habitual
errors. Wing and Baddeley found that slips were more numerous than habitual errors in the native speakers' papers they examined. It seems likely, however, that ESL students may commit more real mistakes than slips because they have not mastered spelling to the extent that native speakers have.

Third, students whose language does not employ a Roman alphabet will make fewer spelling errors than the other students. In the case of this study, we expect to find higher error rates among the Malay and Spanish speakers than among the Arabic and Chinese speakers. Oller and Ziahosseiny showed this to be the case in their study.

Fourth, spelling errors will tend to occur in the medial position of the word. Wing and Baddeley's finding supports this contention. Research into the psychology of language has shown that the initial and final letters of a word serve as markers for the writer's memory. As a result, the writer is more likely to recall those portions of the word and spell them correctly than he/she is to spell the medial part of the word correctly. It is expected, therefore, that the language of the ESL student will have little bearing on this psychological aspect of writing. We expect also, that the spelling error distribution will be similar.
In this chapter, the results are presented and discussed. The predictions made concerning the data are verified and the significance of the findings is presented. Finally, some pedagogical implications are discussed.

Prediction Results

The data were analyzed first using an SPSS (Statistical Package for the Social Sciences) program to find the correlations between each of the 21 variables and the means for each language. The variables and their names follow; ID-identification, L-language, TWW-total words written, MM-Michigan score, TE-total errors, SL-slips slips, HE-habitual errors, 00-omissions, SS-substitutions, II-insertions insertions, RR-reversals,VV-vowel, CC-consonant, HH-homonym, OT-other, IN-initial, ME-medial, FI-final, RR-repeated errors, AG-age, SX-sex.

The prediction results are as follows. The first prediction concerned error percentage. The results show that the average of the four ERPCT means was 1.88%. That is, for all four language groups 1.88% of the words in the compositions had at least one error (both slips and habitual errors were included). Chedru and Geschwind reported an error rate of 1.1% for native speakers. The prediction of a higher error rate for non-native speakers is therefore
supported. The results are shown in table 1.

TABLE 1. Error percentage means for four languages

<table>
<thead>
<tr>
<th>LANGUAGE</th>
<th>TWW</th>
<th>TE</th>
<th>ERPCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arabic</td>
<td>207.3</td>
<td>4.44</td>
<td>2.55</td>
</tr>
<tr>
<td>Chinese</td>
<td>213.0</td>
<td>4.20</td>
<td>2.05</td>
</tr>
<tr>
<td>Malay</td>
<td>227.5</td>
<td>2.20</td>
<td>1.13</td>
</tr>
<tr>
<td>Spanish</td>
<td>272.4</td>
<td>4.58</td>
<td>1.78</td>
</tr>
</tbody>
</table>

It was reported by Wing and Baddeley that slips were much more frequent than habitual errors in the papers of native speakers. Slips were designated as those errors which were corrected elsewhere in the text. Habitual errors were those which went uncorrected. My second prediction stated that the opposite case would be true for non-native speakers: slips will not be more numerous than habitual errors for non-native speakers. The data showed that for all groups the mean number of slips was .19 while the mean number of habitual errors for all groups was 3.66. The breakdown is reported in table 2.

The third prediction, that the Malay and Spanish speakers will, as a group, have a higher error rate than the Arabic and Chinese speakers as a group, was based on Oller
and Ziahosseiny's findings. In order to determine whether or not the difference in error percentage means was significant, I used the Anova oneway analysis which computes an analysis of variance and tests of significance. The mean for error percentage of the Arabic-Chinese group (non-Roman alphabet languages) was 2.30% of words misspelled, while for the Malay-Spanish group (Roman alphabet languages) it was 1.45%. The result of the test for significance was negative. The pooled variance estimate probability showed that there is not a significant difference in error percentage between the two groups (p=.072). The separate variance estimate showed a similar result, that the probability that the two groups have a significant difference as to error percentage is not significant (p=.123). This does not corroborate Oller and Ziahosseiny's findings.
This difference in findings may be due to several factors. One may be that the earlier study did not control for language proficiency. Therefore, their NR and R data may have been unequally distributed according to language proficiency. This could have influenced the error percentage for their students. A second explanation is that our samples may be from different NR and R languages. They report only that:

In R, the preponderance of subjects spoke a Romance (Spanish was the most common) Germanic, or Slavic language. In NR, the majority of students spoke a dialect of Chinese, Japanese, or a Semitic language.

There may also be a difference according to the slip/habitual error division of error. In my analysis, total error includes both slips and habitual errors. Oller and Ziahosseiny do not indicate a breakdown of the two kinds of misspellings.

The fourth prediction maintained that errors will be made more often in the medial position of the word rather than the initial or final position. This prediction was borne out by the present study as well. The mean for all groups at the initial position was .428, for the medial position, 2.61 and for the final position, .66. The language group means are reported in table 3.

In order to test the significance of the differences between these means, I used an SAS (Statistical Analysis
TABLE 3. Error position means for four languages

<table>
<thead>
<tr>
<th>LANGUAGE</th>
<th>INITIAL</th>
<th>MEDIAL</th>
<th>FINAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arabic</td>
<td>.33</td>
<td>3.55</td>
<td>.55</td>
</tr>
<tr>
<td>Chinese</td>
<td>.40</td>
<td>3.20</td>
<td>.60</td>
</tr>
<tr>
<td>Malay</td>
<td>.10</td>
<td>1.00</td>
<td>.90</td>
</tr>
<tr>
<td>Spanish</td>
<td>.88</td>
<td>2.70</td>
<td>.58</td>
</tr>
</tbody>
</table>

System program (Proc Anova) which generated appropriate results for a split plot experimental design. The subjects show marginally significant differences (p<.025) among each other, controlling for language difference. There is also a strong significance (p<.01) when comparing average number of errors in each of the three error positions. Specifically, medial errors were most frequent, the final errors were second most frequent and initial position errors were least frequent. The Spanish speakers, however, do not adhere to this pattern. Further, the average number of error in each position varies significantly according to language (p<.025).

Other Findings

The data analysis yielded a number of statistics which is useful for their descriptive value. Error type consisted of: O0-omission of a letter, SS-substitution of one letter
for another, II-insertion of an extra letter and RR-reversal of position of two letters. The means for the four languages are reported in table 4.

TABLE 4. Error type means for four languages

<table>
<thead>
<tr>
<th>LANGUAGE</th>
<th>OO</th>
<th>SS</th>
<th>II</th>
<th>RR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arabic</td>
<td>1.33</td>
<td>2.11</td>
<td>.78</td>
<td>.22</td>
</tr>
<tr>
<td>Chinese</td>
<td>1.30</td>
<td>1.70</td>
<td>1.00</td>
<td>.10</td>
</tr>
<tr>
<td>Malay</td>
<td>.45</td>
<td>.90</td>
<td>.75</td>
<td>.20</td>
</tr>
<tr>
<td>Spanish</td>
<td>1.47</td>
<td>2.06</td>
<td>.82</td>
<td>.23</td>
</tr>
</tbody>
</table>

These results show that for every language group the most common error was substitution of one letter for another; the second most common was omission of one letter; the third most common error was insertion of an extra letter; and finally the least common was reversal of letter position. The variation from the pattern by the Malay group may warrant a more intensive study.

A second finding concerns error category. The error categories in this study were as follows: VV-vowel error, CC-consonant error, HH-homonym error and OT-other (British English). In other words, measured the target letter rather than the actual letter. The means are reported in table 5.
TABLE 5. Error category means for four languages

<table>
<thead>
<tr>
<th>LANGUAGE</th>
<th>VV</th>
<th>CC</th>
<th>HH</th>
<th>OT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arabic</td>
<td>3.00</td>
<td>1.22</td>
<td>.0</td>
<td>.11</td>
</tr>
<tr>
<td>Chinese</td>
<td>1.60</td>
<td>2.00</td>
<td>.0</td>
<td>.60</td>
</tr>
<tr>
<td>Malay</td>
<td>.75</td>
<td>1.00</td>
<td>.15</td>
<td>.45</td>
</tr>
<tr>
<td>Spanish</td>
<td>2.17</td>
<td>1.88</td>
<td>.05</td>
<td>.41</td>
</tr>
</tbody>
</table>

In this case the Arabic and Spanish speakers have the same ordering: vowels, consonants, 'other' and homonym. In the case of the Chinese and Malay however, the order is: consonant, vowel, 'other' and homonym. In all cases, there are very few errors in the two categories of homonym and 'other'. These categories might therefore be eliminated in future studies.

The means for the remaining descriptive statistics, Michigan score and, age are reported in table 6.

Again, the Malay students exhibit a difference in characteristics. They have the highest Michigan score mean but are the youngest students, on the average.

The sex of the subjects is reported in table 7.
TABLE 6. Michigan score and age means for four languages

<table>
<thead>
<tr>
<th>LANGUAGE</th>
<th>MICHIGAN</th>
<th>AGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arabic</td>
<td>84.44</td>
<td>26.33</td>
</tr>
<tr>
<td>Chinese</td>
<td>84.80</td>
<td>24.60</td>
</tr>
<tr>
<td>Malay</td>
<td>86.10</td>
<td>22.35</td>
</tr>
<tr>
<td>Spanish</td>
<td>84.06</td>
<td>24.88</td>
</tr>
</tbody>
</table>

TABLE 7. Sex of the subjects by language

<table>
<thead>
<tr>
<th>LANGUAGE</th>
<th>FEMALE</th>
<th>MALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arabic</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Chinese</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Malay</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Spanish</td>
<td>6</td>
<td>11</td>
</tr>
</tbody>
</table>

Qualifications of Findings

It should be noted, however, that the slip count in the present study may be deceptive as there was no way to know in some cases if the error was really a slip. This happened because of our definition which treats slips as corrected errors. If the student wrote the word only once and it was misspelled it could be, in fact, a slip. A second
qualification must be mentioned. It can be supposed that because the subjects wrote freely, that is they could choose the words they wanted to use, that the avoidance strategy affected the spelling error percentages for at least some of the students. In other words, a dictation written by these same subjects could possibly yield a different error rate percentage.

Conclusions: Implications for Further Research and Pedagogy

The results of the data analysis in this study show first of all that it is possible to classify spelling errors into meaningful groups and to thereby gain an idea of the nature of ESL students' spelling errors at this proficiency level.

We can say with some certainty now that non-native speakers at this proficiency level make more errors than native speakers do. Secondly, we can say that non-native speakers at this proficiency level make more habitual errors than slips. Thirdly, we can say for this proficiency level, there may be no significant difference in error percentage between non-Roman and Roman alphabet language speakers. Finally, we can say with some certainty that ESL students at this proficiency level will tend to make errors in the medial position of the word. This suggests that at least for this advanced group of ESL students a certain similarity
with native-speakers in the location of their spelling errors.

The findings of this study were reached by applying error analysis (EA) to a list of 205 spelling errors. An application of the contrastive analysis (CA) hypothesis might have first made a study of the differences in spelling systems between each of the four languages and American English. The predictions would be based on those differences. One disadvantage to this particular methodology is that the investigator would have to be familiar with the four spelling systems. In addition, CA would direct this study at only a portion of the cause of errors. Error analysis however, because it is a posteriori in nature, can offer evidence for more than one error cause. The speaker who spelled 'significant' in the following way; 'significative' might be translating directly from his/her first language. On the other hand the Chinese speaker who spelled 'transportation' as; 'transpotation' may be transferring his/her incorrect pronunciation into spelling. All of these errors, in addition to errors which all the non-native speakers made, are a part of the students' own spelling system: a conglomerate of transfer, interference, difficulty with AE spelling, and other factors. In this present study, I have not restricted myself to determining the cause of only some of the spelling errors, but rather
have chosen to look at all of them for patterns. Some of these patterns are similar to those exhibited by native speakers and some are not. This suggests that there may be similar causes for at least some of the spelling errors of non-native and native speakers, although we do not yet have conclusive evidence. A CA study would undoubtedly offer interesting findings but it would not give researchers and teachers of ESL students a broad look at spelling errors, as the present study has done.

Secondly, we can say that there is room for more studies on this subject. Do my findings hold up over a larger group of students at the same proficiency level? Would students at other proficiency levels exhibit different error characteristics? Would a larger word sample (from a two hour essay, for instance) reveal a difference in error characteristics? These are some of the questions which can lead to further studies of ESL students' spelling errors.

On the subject of pedagogy, this study can make a tentative recommendation. We observed that such variables as total words written and total errors do not vary significantly by language, suggesting that at present we have no evidence that spelling pedagogy should vary according to language. In addition, we found that habitual errors are more common than slips in ESL students' writing. This suggests that ESL spelling errors are genuine, thus
underscoring the need for spelling in the ESL classroom.

In the light of the evidence that ESL students' errors tend to be real mistakes, the teacher needs to be very conscientious about bringing misspellings to the students' attention and making sure that the student works closely with the teacher in learning the correct spelling. Mina Shaughnessy pointed out that her BU students have an "inexperienced eye" for spelling. This may be true also of ESL students. Shaughnessy attributes spelling error to this and three other causes. Those causes, she writes, are "the spelling system itself, differences between spoken and spelled English [and] ignorance of the rules that work."

This study has indicated that there may be some similar error patterns between native and non-native speakers. In this case, it may be helpful for ESL teachers to re-examine their own spelling pedagogy, in the light of Shaughnessy's suggestions.
LIST OF WORKS CONSULTED


APPENDIX

ARABIC A1 167W 84M ACCOMBLISH/ACCOMPLISH SEPERATED/SEPARATED

A2 164W 84M HANDICAPED/HANDICAPPED ERRASE/ERASE

A3 197W 84M AFFACTED/AFFECTED EXPERIANCE/EXPERIENCE
INDEPENDANCE/INDEPENDENCE BEHINDE/BEHIND

A4 152W 85M PREDICTION/PREDICTION SIXENTY/SEVENTY
CONTRARIPTIVES/CONTRACEPTIVES EGYPTIONS/EGYPTIANS
SPECIALY/SPECIALLY TRYS/TRIES EGYPTIEN/EGYPTIAN
GOVERNEMENT/GOVERNMENT PROGRAMMES/PROGRAPIS
PROGRAMMES/PROGRAMS

A5 194W 82M SPEACCIALY/SPECIALLY EDUCAT/EDUCATE
SCOURCES/SOURCES INTER/ENTER CENTRALIZED/CENTRALIZED

A6 263W 82M NO ERRORS

A7 337W 87M NO ERRORS

A8 148W 87M GREWING/GROWING POULATION/POPULATION
SUMMURE/SUMMER PRBLEM/PROBLEM PRBLEM/PROBLEM
EXPERIANCE/EXPERIENCE INDEPENDANCE/INDEPENDENCE ENUGH/ENOUGH
PROUDCTION/PRODUCTION PROUDCTION/PRODUCTION

A9 244W 88M CONTRY/COUNTRY INDEPENDANT/INDEPENDENT
INDEPENDANCE/INDEPENDENCE TREMENDEOUS/TREMENDOUS
CONTRY/COUNTRY BENEFIC/BENEFICIAL OWNS/OWNS
TECHOLGY/TECHNOLOGY

CHINESE C1 123W 82M TECHNOLOG/TECHNOLOGY

C2 172W 84M. COLOUR/COLOR UTILISE/UTILIZE
EMPOLYEES/EMPLOYEES EFICIENTLY/EFFICIENTLY UTILISE/UTILIZE
SATELLIE/SATELLITE MODERNIED/MODERNIZED

C2 155W 83M CROWED/CROWDED MORDERN/MODERN

C3 169W 89M GOVERNENT/GOVERNMENT STEADILY/STEADILY
UNPLOMENT/UNEMPLOYMENT

C4 186W 80M GOVERNENT/GOVERNMENT VERTARN/VETERAN
PEASENTS/PEASANTS MACHING/MACHINARY PARHAPS/PERHAPS
TYPIED/TYPED PEASENTS/PEASANTS HASITATION/HESITATION

C5 332W 88M NO ERRORS

C6 406W 85M CONFROUNDS/CONFRONTS CENTURAL/CENTRAL
CONFROUNTED/CONFRONTED DEFENCE/DEFENSE PURCHURSE/PURCHASE
PER CAPITAL/PER CAPITA BRODERN/BROADEN

C7 173W 88M AUTOMIZED/AUTOMATED

C8 195W 81M TECHNOLOGIES/TECHNOLOGY CENTRY/CENTURY
COUNTRY/COUNTRY GOVERMENT/GOVERNMENT

C9 229W 88M BEGGERS/BEGGARS ARROUND/AROUND
ACARDED/SCARED TRANSPORTATION/TRANSPORTATION
HAPPINESS/HAPPINESS TRAFFIC/TRAFFIC BAY/DAY TRAFFIC/TRAFFIC
HAPPINESS/HAPPINESS

MALAY M1 258W 88M UNTHINKABLE/UNTHINKABLE

PHENOMENO/PHENOMENON

M2 374W 83M NO ERRORS

M3 185W 83M NO ERRORS

M4 217W 83M PLOUGH/PLOW PLOUGHING/PLOWING

ACHIEVEMENT/ACHIEVEMENT POPULATION/POPULATION

M5 173W 87M RACIAL/RACIAL

TELECOMUNICATION/TELECOMMUNICATION INFORMATIONS/INFORMATION

COMMUNICATION/COMMUNICATION

M6 269W 88M MACHINES/MACHINES

SOPHISTICATED/SOPHISTICATED

M7 180W 85M TECHNOLOGY/TECHNOLOGY

M8 244W 83M DEVELOPMENT/DEVELOPMENT PLOUGH/PLOW

EQUIPMENTS/EQUIPMENT UNCIVILISED/UNCIVILIZED

SHORTER/SHORTER GOVERNMENT/GOVERNMENT

M9 297W 89M NO ERRORS

M10 143W 86M MACHINERIES/MACHINERY EQUIPMENTS/EQUIPMENT
ELECTRICALS/ELECTRICAL

M11 242W 89M EFFECTED/AFFECTED OCCURRED/OCURRED

M12 238W 87M NO ERRORS

M13 218W 89M NO ERRORS

M14 153W 87M SOPHISTICATED/SOPHISTICATED

MACHINERIES/MACHINERY MACHINERIES/MACHINERY

MACHINERIES/MACHINERY EXPATRIATES/EXPATRIATES

EXPATRIATES/EXPATRIATES

M15 206W 88M HIGHRISED/HIGHRISE

PROFESSIONALISTS/PROFESSIONALS BUNGALOS/BUNGALOWS

M16 351W 84M EDUCATIONALS/EDUCATION

M17 227W 87M AEROPLANES/AIRPLANES PEOPPLE/PEOPLE

ENDANGER/ENDANGER

M18 112W 86M TRANSPORTATIONS/TRANSPORTATION

ADVANTAGEOUS/ADVANTAGEOUS

M19 219W 82M MACHINERIES/MACHINERY MACHINERIES/MACHINERY

M20 245W 88M MACHINERIES/MACHINERY EQUIPMENTS/EQUIPMENT

MACHINARIES/MACHINERY

SPANISH S1 429W 84M SPECIALL/ESPECIALLY

METODOLOGY/METODOLOGY Specially/ESPECIALLY
INDUSTRIALISED/INDUSTRIALIZED

DEPENDANCE/DEPENDENCE

DEPENDANCE/DEPENDENCE

PROBABLE/PROBABLY

S2  393W  86M VARIETES/VARIETIES RENOVABLE/RENEWABLE

NONRENOVABLE/NONRENEWABLE

BUROCRATIC/BUREAUCRATIC

AGILIZATION/  ? TO/TWO HAVEN/HAVEN'T

APPROPRIATE/APPROPRIATE

NOCIVE/NOTICEABLE?  AFFERTS/OFFERS

S3  366W  87M BELEIVED/BELIEVED PUNSHING/PUSHING OR

PUNCHING?  WOIST/WORST

S4  153W  85M UNDEVELOP/UNDEVELOPED

MACHINARY/MACHINERY

S5  343W  81M COMMUNITY/COMMUNITY

SE/SEE

S6  323W  86M GENERALL/GENERAL

SENCE/SENSE?

S7  117W  82M MIAKE/MAKE

EFFECTED/AFFECTED

S8  163W  83M MACHINARY/MACHINERY

EQUIPMENT/EQUIPMENT

STABLISH/ESTABLISH

TELEVITION/TELEVISION

COSTUMS/CUSTOMS

COSTUMS/CUSTOMS

S9  228W  83M GOVERMENT/GOVERNMENT

SIGNIFICATIVE/SIGNIFICANT

RAZON/REASON

S10  162W  83M

NO ERRORS

S11  417W  89M

DECISSION/DECISION

DISAPPROVE/DISAPPROVE
DEISSION/DECISION

S12  324W  84M REALY/REALLY MENSION/MENTION
INESTABILITY/INSTABILITY BANCARUPCY/BANKRUPTCY
INESTABILITY/INSTABILITY RECEIVED/RECEIVED
GOVERNMENT/GOVERNMENT CONFLICTIVE/ISOLATED
REALY/REALLY ACOSTUM/ACCUSTOMED QUITES/QUIETS
TIRENESS/ TIREDNESS BANCARUPCY/BANKRUPTCY
INESTABILITY/INSTABILITY WHANTS/WANTS ADVANTAGE/ADVANTAGE
CONCRET/CONCRETE

S13  162W  80M PROBLEMS/PROBLEMS PROBLEMS/PROBLEMS
PROBLEMS/PROBLEMS PROBLEMS/PROBLEMS PROBLEMS/PROBLEMS
QUANTITIES/QUANTITIES GOVERNMENT/GOVERNMENT MONY/MONEY
MACHINARY/MACHINERY TECHNIQUES/TECHNIQUES

S14  190W  84M DIFFENCES/DIFFERENCES OBLIGUED/OBLIGED

S15  285W  86M CRIMINALITY/TRIPLED
OPTIMISTIC/OPTIMISTIC

S16  300W  82M IMPOSSIBLE/IMPOSSIBLE
RESPONSABLE/RESPONSIBLE COUNTRY/COUNTRY

S17  277W  84M NO ERRORS
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