

## **CHAPTER THREE**

### **METHODOLOGY**

This chapter deals with the research design of the study. It concerns how the subjects are chosen, how data is collected and how the analysis is proceeded. As one of the main purposes of this study is to inspect the spelling errors students make in vowel substitution and then find out some common patterns shared by the students, subjects are randomly chosen from the third year students in the junior high school. And data are elicited through a two-stage experiment. At first, a vocabulary translation test is carried out to get a picture of subjects' spelling error patterns on vowel substitution. Then a second experiment follows—a test of three tasks, (1) reading test, (2) listening test, and (3) dictation spelling test. Observations made from the previous data of stage one are testified through the stage two experiment. Therefore the contents of this chapter include subjects, experiments in two stages and data analysis.

#### **3.1 Subjects**

Subjects for the first stage are randomly chosen from the third year students in Ku-ting Junior High School in Taipei. One hundred and six students from four classes are engaged in the stage one experiment. The numbers of female and male students are about the same. The students in each class are with multiple levels of English proficiency. The second stage of the experiment is a qualitative study in itself compared with the first stage—a quantitative study. Only six subjects with the typical spelling errors are chosen to be the participants.

All the subjects have received formal instruction of the phonetic symbols and basic rules about pronunciation, that is, phonics instruction, for at least one year, which is included in the teaching syllabus of Book One and Book Two of the junior high school English textbooks (2000) published by the National Institute for Compilation and Translation (NICT). Besides, subjects receive further phonics instructions in the second school year with the textbook, *Phonics Workbook* (2001), which is also published by NICT. With the previous instructions, the subjects are expected to employ their pronunciation knowledge while spelling.

The six subjects who are singled out to participate in the second stage for they show some common error patterns in their spelling data collected at stage one. Furthermore according to an oral interview, most of them are found to share a similar spelling strategy—sounding out the words first when attempting to spell, except for one subject. Their cooperative attitude toward the experiment is another factor to be considered. As for the English proficiency level, one of the subjects is at the high level, one is at the low level and four at the intermediate level, according to their performance in class.

### **3.2 Questionnaire**

In stage one, a questionnaire of vocabulary list (Appendix A) is constructed to find out the most difficult or most frequently misspelled words for the students. The purpose of it is to identify common spelling problems to design a vocabulary translation test for stage one. The questionnaire is distributed to ten English teachers in two different junior high schools with at least three-year teaching experience. The teachers are asked to mark the most frequently misspelled or difficult words for the subjects without a limit on quantity. All the vocabulary appearing in the textbooks

from Book One to Book Four is listed in the questionnaire.

According to the questionnaires, the frequency of each word marked by the teachers is calculated. The words with more than two counts (including two) are selected to construct the vocabulary translation test of the stage one. Three hundred and twenty-eight vocabulary test stems are listed on the test paper according to the outcome of the frequency count from the questionnaires.

### **3.3 Vocabulary Translation Test**

The experiment in stage one is a vocabulary translation test conducted in October, 2002. This vocabulary translation test is based on Wang's (1994) method mentioned in Chapter Two to get spelling error patterns of the subjects.

As the quantity of vocabulary is not very small, it is separated in three sessions to avoid the fatigue caused by a long testing time. Time span for each session is flexible, but it lasts about 20 minutes for each test. The test givers, however, are still asked to give subjects enough time to finish the test for maximizing the outcome of the testing.

According to the data collected from the questionnaire (see Appendix A), three hundred and twenty-eight words are listed as the test items in the test paper for stage one test (See Appendix B). In this test, subjects are given test items with Chinese equivalents of the English words. They are asked to write down the corresponding English words in the blanks provided next to the Chinese counterparts. If the item has more than one possible answer, the first letter of English word is given. This test is designed in a way of Chinese-English translation to rule out the oral guidance from the test givers, which may otherwise happen in a dictation of English vocabulary. On the other hand, this test also allows the subjects to fully exercise their spelling strategies or rules they have acquired. That is to say, subjects has to depend totally on

themselves when attempting to spell a word without any extra hint which might be given from the test giver.

On the other hand, subjects are not informed of the test in advance, so that they do not depend on short-term memory to do the spelling. The test giver, the English teacher of each class, is asked to remind their students to do their best on this test before the test begins.

Data are analyzed with a main focus on vowel error substitution. They are categorized according to the replacing vowel letter (the substitute). Four categories are found: (1) substitute letter “a”, (2) substitute letter “e”, (3) substitute letter “o”, and (4) substitute letter “i”.

The calculation of the errors is based on the number of the occurrence of the vowel substitution in the task. The definition of vowel substitution is where one vowel letter is replaced by others. The deletion of a vowel letter or a whole syllable is excluded from the calculation. Besides, the frequency of substitution counted is basically the vowels in stressed syllables and non-stressed vowels other than schwa /ə/. In other words, the substitution of a vowel letter pronounced as /ə/ is ignored<sup>1</sup>.

Major findings of the spelling errors found in stage one are tabulated in Table 3.1.

**Table 3.1 Results of Vowel Substitution in Stage One**

<b>Substitution</b>	
1. Substitute letter <b>a</b>	(1) letter <b>a</b> replacing letter <b>e</b>
	(2) letter <b>a</b> replacing letter <b>o</b>
	(3) letter <b>a</b> replacing letter <b>u</b>
	(4) letter <b>a</b> replacing digraph <b>ea</b>
	(5) letter <b>a</b> replacing letter <b>i</b>
2. Substitute letter <b>e</b>	(1) letter <b>e</b> replacing letter <b>a/a-e</b>
	(2) letter <b>e</b> replacing digraph <b>ea</b>
	(3) letter <b>e</b> replacing letter <b>i</b>
3. Substitute letter <b>o</b>	(1) letter <b>o</b> replacing letter <b>a</b>
	(2) letter <b>o</b> replacing digraph <b>ou/ow</b>
4. Substitute letter <b>i</b>	(1) letter <b>i</b> replacing letter <b>e</b>
	(2) letter <b>i</b> replacing letter <b>a</b>
	(3) letter <b>i</b> replacing digraph <b>ai</b>

Not all the forms of errors are listed; that is, only the main entries are shown in the table. When there are many different misspellings for a word but all with the same vowel letter substitution, only one kind of spelling is listed but all the errors are still counted. On the other hand, the entry of misspellings with final **e** is up to the stressed target vowel letter. For instance, misspelled words like *cride*, *crite*, and *crity* for **credit** are all classified into the same entry *crity*, for the final **e** (as in *cride* and *crite*) is not used to indicate a long vowel of the target letter. However, misspellings like *done* and *don* for **down** are separately listed, for the final **e** is influential in a monosyllabic word. The frequency entry of each kind of misspelling represents the total misspelling frequency of each type. Therefore, the misspelling for **credit** is listed as *crity* with frequency counted as **8**, which is the error frequency to indicate how

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<sup>1</sup> As schwa /ə/ can almost be spelled by every vowel letter, a substitution of this kind is excluded.

many times the substitution takes place.

### **3. 4 Stage Two Experiment**

After the data are analyzed, the second stage experiment is then carried out in April and May of 2003. The three-task experiment is divided in four sessions with at least one or two weeks gap in between to avoid any inference drawn from the former test items. Each session usually lasts not more than ten minutes for each subject. The test order is arranged as followed: first, the reading test is given, then the spelling, and finally, the listening test. Moreover, tests of each group are not carried out with its counterpart corresponding test(s) at the same time so that the subjects cannot get any hint from the corresponding tests. For example, reading test 1 does not go with spelling test 1 or listening test 1 so that subjects can only count on their knowledge and strategy of spelling to rule out the implication from the given test items. And similarly, subjects are not advised of the tests before hand, but are encouraged to do their best when taking the tests.

#### **3.4.1 Reading Test**

In the reading test, six subjects are asked to read a list of vocabulary with a purpose to assess subjects' knowledge about phonics. More than half of the vocabulary are what the subjects have learned in the textbooks and the rest are not on textbook vocabulary list. The addition of the latter half with the unfamiliar vocabulary is to prevent subjects' direct retrieval from memory in reading the test items and to evaluate the subjects' phonics knowledge. The selected words in this test basically are those which may lead the subjects to some confusion in spelling, according to the observations in stage one. However some other words beyond such possibility are still

added to balance the test items. (See Appendix C).

### **3.4.2 Listening Test**

This listening test (Appendix D) is to examine the perception of subjects towards the vowels they have learned. Test items basically include the words with the same vowels as in the reading test. However, words which do not show on the textbook vocabulary list are increased. It means that more words that the subjects hear from the tape are not familiar to them so that they need to rely heavily on their own phonics knowledge to complete the task, instead of depending on their memory only. From this test, subjects are evaluated on whether they are able to distinguish similar vowels. When listening to the tape, subjects are asked to check the corresponding English words according to the vowel sound they have heard from the tape.

### **3.4.3 Dictated Spelling Test**

In this spelling test (Appendix E), the subjects are asked to spell the words they have heard from the tape. Such a dictated spelling test is usually employed to assess spelling ability (Masterson & Crede, 1999). Especially, the dictation spelling test is to rule out the possibility that subjects might use hints or cues other than the pronunciation (sound) of the test items. Thus the relation between pronunciation and spelling can be firmly built and it accordingly excludes other affecting factors in the spelling test. The selection of test items is also based on the error patterns observed in stage one. This final test is to examine whether the results exhibit the same or similar patterns which have shown in the stage one experiment.

### 3.4.4 The Design of the Three Tests

As a whole, the contents of the spelling test, along with the other two (reading and listening tests) in stage two, are designed to verify the error patterns subjects show in the first stage. All the test items (in reading, listening, and spelling) consist of five groups of words containing different vowel groups: (1) /ɛ/, /e/ and /æ/ (as **west**, **gate**, and **bad**), (2) /ɛ/ and /ɪ/ (as **set** and **sit**), (3) /ɑ/ and /ʌ/ (**got** and **gut**), (4) /aʊ/, /ɑ/, /ʌ/ (as **down**, **Don**, and **done**), and (5) vowels preceded by letter **r**, or a consonant cluster with letter **r**-(C) + letter **r** + V (as **rich** and **cram**). Moreover, the order of some test items which are originally arranged in minimal pairs is scrambled to eliminate the possible order effect which may imply the correct answer by presenting the words in a minimal pair order. Only the items of the listening test are arranged in minimal pair to test subjects' knowledge about spelling patterns.

Meanwhile during the experiment of the second stage, all the subjects' oral productions in the reading test are tape recorded. Each subject's recording is analyzed by two English teachers independently to transcribe subjects' performance on vowels. If disagreements occur between the two teachers, then a third teacher will be consulted for the final decision.

As to the listening and spelling parts, the pronunciation of the speaker on the tape is required to be natural and clear. The speaker is an English native speaker teaching in Joy Children Language School to save the subjects from any confusion caused by unclear enunciation. The pause between each test item, in listening test is two seconds and in spelling, five seconds. However, the subjects are still allowed more time to finish the answer if necessary.

In short, the stage two experiment includes reading, listening and spelling parts and is designed in accordance with the results found in the stage one experiment to



verify the error patterns captured in stage one.