A REVIEW OF ENGLISH CONSONANTAL PHONOLOGY FOR

HIGH SCHOOL ENGLISH TEACHERS IN TAIWAN

by *6407*

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A MASTER'S REPORT

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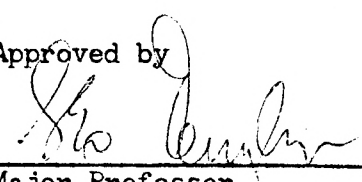requirements for the degree

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# Chapter I

## INTRODUCTION

### 1.1. Purpose

Today in Taiwan it is a rare discussion of English language teaching problems that fails to make reference to the views of descriptive linguistics, but the fact is that classrooms are still manned largely by Chinese teachers of English who do not have access to the benefits of applied linguistics, and whose own proficiency in the language is not perfect. This is the case in the school operated by my family in the southern part of Taiwan. Our school has about 2,500 students at the junior and senior high school level and is oriented to the commercial curriculum and business training. Five hours per week instruction in English is compulsory for all students, in line with national requirements for accreditation. There is a great problem for our teachers to help students pronounce English sounds with anything like intelligibility, when even they themselves have trouble producing them adequately.

There has been a good deal of work in contrastive analysis of English and Mandarin, and of English and Formosan, but it is scattered in the literature and largely unavailable to high school teachers such as those in my family's school. There is a need for a practical review of English phonology, then, for the junior and senior high school teacher in Taiwan who has both speakers of Mandarin and speakers of Formosan as students in classes in English. This report is an attempt to collect and synthesize some of the otherwise atomistically distributed information on dealing with problems in pronunciation of English encountered by both Mandarin and Formosan speakers, for the convenience of junior and senior high school teachers in Taiwan. If this review is also useful to other students and teachers at other levels and

in other places, so much the better, but it is the Chinese teacher of English in the high school in Taiwan that we have specifically in mind and to whom this report is specifically addressed.

Though consideration is given to such other aspects of phonology as vowels and intonation as they come to bear on the realization of consonants, primary attention is given here to the consonants. This limitation is largely arbitrary, occasioned by considerations of scope. A review of other aspects of phonology is certainly needed, but is not possible to include here.

## 1.2. Review of Literature

Since World War Two the teaching and learning of English has developed as a popular business in every corner of the world and many linguists have given much attention to the linguistic problems in teaching and learning English phonology. We can find many books concerned with the contrastive analysis approach to the teaching of English phonology which are very useful to this report. Some important ones are as follows:

### 1.2.1. Studies of English Linguistics and Phonology

Bloomfield (1933) in his major work states that the first step in the description of a language is phonology. He views vowels and consonants as primary phonemes, stress and pitch as secondary phonemes. In chapter five Bloomfield describes the English consonants comparing them with consonants of some European languages from the view point of articulatory differences. Trager and Smith (1957) represent in many ways the linguistic developments since Bloomfield. They set up an analysis of the sound system of American English including stress, pitch, and juncture. They deal with consonants and consonant clusters in page twenty-nine through thirty-five. Their widely accepted analysis of English providing a stable phonemic system accounting for

all speakers rather than the one idiolect being described. This analysis rapidly came to be widely accepted and used among linguists in America. This is one of the reasons why this report uses Trager and Smith's phonemic transcription in the study of consonants. Gleason (1961) provides a general view of descriptive linguistics. In chapter two Gleason follows Trager and Smith's English phonemic transcription in describing English consonants. Daniel Jones (1956) presents clear statements about how to make each English consonant and vowel with detailed diagrams. He uses IPA in his study and description of the southern British English sound system. He also points out the difficulties of pronunciation for learners but it is limited to the speakers of some European languages only. Hill (1958) in chapter three of his work states that the differences between vowels and consonants rest not on their phonetic quality but on their differing distribution. Hill, following Trager and Smith's phonemic transcription, makes structural statements about consonants and vowels in different positions. In chapter two Francis (1958) describes the English phonological system. He presents thirty-two consonantal sounds of common occurrence in American English and states how each consonant is formed together with its distribution in detailed explanations. Bronstein (1960) in chapter two of his work details consonants, vowels, and complex consonants and vowel clusters of American English. The formation and acoustic values of these sounds, and their modifications and variations in the stream of speech, are presented. Wise (1960) provides diagrams to illustrate consonant and vowel systems for articulatory training of students in English. Lado and Fries (1958) provide a description of the English sound system. They present articulatory diagrams and exercises following each lesson for students to practice. Davidsen-Nielsen (1969) discuss the phonemic and phonetic characteristics of stop consonants in English after initial /s/ with reference to

the related aspiration, voicing, and force of articulation. Pike (1947) in his work provides clear statements of field work in contrastive analysis of two languages. His method for the discovery of the phonemic units is to record the phonetic data, to make a phonetic chart, and to list suspicious and nonsuspicious pairs of sounds. The procedures Pike presents are basically adopted for this report.

### 1.2.2. Studies in Mandarin and in contrastive analysis of English and Mandarin

Yuen-ren Chao (1948) discusses the dialects of Chinese. He observes that Mandarin dialects differ in three main respects: pronunciation, vocabulary, and grammar. However his phonemic chart is written for his own dialect which is not pure Mandarin. This is why the writer will not refer to him in this report. Raymon Huang (1969) provides Mandarin Chinese pronunciation explained with diagrams. It is based on phonetic and contrastive analysis for the teaching of Mandarin pronunciation to the speakers of English, but he does not present his contrast between Mandarin and English sound systems. Chong-sun Na (1968) presents a textbook approved by the nationalist Chinese government which is currently used in high schools in Taiwan. It has clear statements of how to make each standard Mandarin Chinese sound with detailed explanations and examples. The phonetic transcription used there was translated from Chinese to English by the writer for the purpose of this report. Helen Wong (1953) attempts to analyze the phonemes of spoken Mandarin Chinese in terms of distinctive features. Fries and Shen (1948) point out the problems of English pronunciation for speakers of Mandarin and provide a good number of practical and valuable drills for Mandarin Chinese speakers to correct their pronunciation. Some of the drills are included in this report. However Fries and Shen do not discuss in detail the cause and nature of each

difficulty for Mandarin speakers in learning English pronunciation.

### 1.2.3. Studies in Formosan

Saunders (1963) points out some of the problems of Taiwanese in learning English sounds. His work is limited but it is still a good reference for Formosans when learning English pronunciation. Y.T. Wang (1957) presents a phonemic view of the Formosan sound system. His work is regarded as the first book on the Formosan dialect and it has been used extensively by many researchers, but his work is limited to the northern part of Taiwan. Alice Chang (1967) points out the difficulty of Formosans in producing the English sound system. Her work is also limited to the small area of north Taiwan.

From the difficulties I had in finding good sources for the study of Formosan dialect, it is clear that further study on the Formosan dialect is needed.

### 1.3. Procedure

The procedure followed in arriving at this report is essentially in three steps:

1. Introduce the phonemic inventories of English on the one hand, and Mandarin and Formosan Chinese on the other hand.

2. Apply contrastive analysis to find gross phonemic differences and also allophonic and phonetic detail differences between English and Mandarin and English and Formosan, utilizing extant work as far as possible and attempting to fill gaps in information, and note the nature of the differences.

3. Point up the problems faced by the Mandarin speaker and the Formosan speaker, respectively, and suggest drills to reduce each problem in the face of the predicted interference.

# Chapter II

## English, Mandarin, and Formosan Consonants

Charted according to place and mode of articulation, the consonant phonemes of English, Mandarin, and Formosan, respectively, may be listed as follows:

2.1.  English consonant phonemes[1]:

|  |  | bila-bial | labio-dental | inter-dental | alveolar | alveo-palatal | palatal | velar | glottal |
|---|---|---|---|---|---|---|---|---|---|
| stop | vl. | p |  |  | t |  |  | k |  |
|  | vd. | b |  |  | d |  |  | g |  |
| fric. | vl. |  | f | θ | s | š |  |  |  |
|  | vd. |  | v | ð | z | ž |  |  |  |
| affric. | vl. |  |  |  |  | č |  |  |  |
|  | vd. |  |  |  |  | ǰ |  |  |  |
| nasal |  | m |  |  | n |  |  | ŋ |  |
| lateral |  |  |  |  | l |  |  |  |  |
| retroflex |  |  |  |  | r |  |  |  |  |
| semi-vowel |  | w |  |  |  |  | y᷉ |  | h |

2.2.  Mandarin consonant phonemes[2]:

|  | bila-bial | labio-dental | alveolar | alveo-palatal | palatal | velar | glottal |
|---|---|---|---|---|---|---|---|
| stop vl.asp. | pʰ |  | tʰ |  |  | kʰ |  |
| vl.una. | p |  | t |  |  | k |  |
| fric. vl. |  | f | s ṣ | š |  |  |  |
| vd. |  |  | z |  |  |  |  |
| affric. vl. |  |  | ts tṣ | tš |  |  |  |
| vd. |  |  | dz dẓ | dž |  |  |  |
| nasal | m |  | n |  |  | ŋ |  |
| lateral |  |  | l |  |  |  |  |
| retroflex |  |  | r |  | y |  | h |
| semi-vowel | w |  |  |  |  |  |  |

## 2.3. Formosan consonant phonemes[3]

| | bila-bial | alveolar | alveo-palatal | palatal | velar | glottal |
|---|---|---|---|---|---|---|
| stop vl. asp. / vd. unasp. | $p^h$ <br> p <br> b | $t^h$ <br> t <br> d | | | $k^h$ <br> k <br> g | |
| fric. vl. | | s | | | | |
| affric. vl. / vd. | | ts <br> dz | tš | | | |
| nasal | m | n | ñ | | ŋ | |
| lateral | | l | | | | |
| semi-vowel | w | | | y | | h |

## 2.4. Summary

1. Both English and Mandarin have counterparts to English voiceless stops /p,t,k/, but in addition have phonemically distinct aspirate voiceless stops /$p^h$,$t^h$,$k^h$/ (English also has aspirate voiceless stop phones, but they are allophones of /p,t,k/ used in initial position).

2. Formosan has counterparts to English voiced stops /b,d,g/ but Mandarin does not.

3. English has fricatives /f,v,θ,d,s,z,š,ž/.

   Mandarin has fricatives /f,s,ş,z,š/.

   Formosan has only one fricative /s/.

4. English has affricates /č/ and /ǰ/.

   Mandarin has affricates /ts, tš, dz, dẓ, dẓ, č/.

Formosan has affricates /ts,dz,c/

5. English /ts/ and /dz/ are regarded as consonant clusters. Mandarin and Formosan /ts/ and /dz/ are unit phonemes.

6. English has nasals /m,n,n̠/. Mandarin and Formosan both have counterparts to these three English nasal phonemes.

7. Formosan has the nasal phoneme /ñ̃/, which lacks a counterpart in both English and Mandarin.

8. Both Mandarin and Formosan have counterparts to English /l/.

9. Mandarin has a counterpart to English /r/ but Formosan does not.

10. Both Mandarin and Formosan have counterparts for English semi-vowels /w,y,h/.

11. Not indicated by the charts is the fact that while neither Mandarin nor Formosan employs consonant clusters, English does. This factor, a source of a good deal of trouble for the Chinese learner in English, will be discussed separately in Chapter 3 below.

2.5. Allophonic differences:

Even in the apparently parallel counterpart phonemes there are phonetic and allophonic distribution differences and phonotactic differences from language to language. These differences are not brought out by tabulation of the gross phonemic differences as above, but they must be understood by the teacher if he is to help the Chinese student achieve anything like control of the English sound system. One way to organize this information for pedagogical purposes is to review the allophonic details of the target language phonemes one series at a time, and at each point refer to the corresponding point in the sound system of the mother tongue of the learner and

tabulate the differences. The result is a list of the pronunciation habits the learner would have to acquire to achieve an acceptable production and discrimination ability in the target language, and an understanding of the interference he would be expected to experience at any point. This procedure, with English as target and with reference to both Mandarin and Formosan, is presented in Chapter 3 below.

# Chapter III

## Contrastive Analysis of English/Mandarin

## and English/Formosan

### 3.0. Contrastive phonemes

Each language has its own pronunciation system, which is different from all others. 'In learning the sound system of a foreign language one finds sounds that are physically similar to those of the native language, that structure similarly to them, and that are similarly distributed. "Learning" of such phonemes occurs by simple transfer without difficulty. On the other hand, one also finds sounds that are not part of the sound system of the native language, that structure differently, or that are differently distributed.' (Lado, 1957: 12) Such factor will be discussed in relation to the different problems the speakers of the two dialects will encounter in learning English.

### 3.1. Stops

English employs voiced bi-labial, alveolar, and velar stops /b,d,g/ and their voiceless counterparts /p,t,k/, any of which may occur in initial, medial, and final positions. The voiceless stops are realized as aspirate allophones in initial position, unaspirate after /s/, weakly aspirate intervocalically, and vary freely from aspirate to unaspirate to unreleased in final position. Both Mandarin and Formosan have /p,t,k/, but their priviledge of occurrence is limited to initial position. Further, both Mandarin and Formosan have phonemically distinct aspirate counterparts /p$^h$,t$^h$,k$^h$/ also occurring in initial position only. Formosan also employs /b,d,g/ in initial position only, but Mandarin has no voiced stops.

We conclude, then, that neither the Mandarin speaker nor the Formosan speaker should have difficulty in producing the aspirate allophones of /p,t,k/

in initial position in English, since he can employ his Chinese aspirate voiceless stops in these situations with quite acceptable results. He can also use his Chinese stops in English inter-vocalic situations by treating them as syllable initials. Predictable problems for Mandarin and Formosan speakers with the stop series arise in connection with the production of any stop in English after /s/, in intervocalic position, and in final position, and additionally for the Mandarin speaker in the use of English /b,d,g/ in all positions, in which cases he commonly attempts to employ his unaspirate Mandarin /p,t,k/.

3.1.2. A list of problems predicted: Stop series

Mandarin   1.  realization of /p/ in final position

2.  realization of /t/ in final position

3.  realization of /k/ in final position

4.  realization of /b/ in initial position

5.  realization of /b/ in final position

6.  realization of /d/ in initial position

7.  realization of /d/ in final position

8.  realization of /g/ in initial position

9.  realization of /g/ in final position

10.  confusion of /p/ and /b/ in initial position

11.  confusion of /p/ and /b/ in final position

12.  confusion of /t/ and /d/ in initial position

13.  confusion of /t/ and /d/ in final position

14.  confusion of /k/ and /g/ in initial position

15.  confusion of /k/ and /g/ in final position

Formosan   1.  realization of /p/ in final position

2.  realization of /t/ in final position

3.  realization of /k/ in final position

4.  realization of /b/ in final position

5.  realization of /d/ in final position

6.  realization of /g/ in final position

Fries and Yao Shen (1948) suggest a drill like the following for reducing these problems:

Drill one: $\left[-p^h\right]$

| | | | | |
|---|---|---|---|---|
| teacher: | /'ip/ | /'ep/ | /'ap/ | /'up/ |
| student: | /'ip/ | /'ep/ | /'ap/ | /'up/ |

Drill two: $\left[-t^h\right]$

| | | | | |
|---|---|---|---|---|
| teacher: | /'it/ | /'et/ | /'at/ | /'ut/ |
| student: | /'it/ | /'et/ | /'at/ | /'ut/ |

Drill three: $\left[-k^h\right]$

| | | | | |
|---|---|---|---|---|
| teacher: | /'ik/ | /'ek/ | /'ak/ | /'uk/ |
| student: | /'ik/ | /'ek/ | /'ak/ | /'uk/ |

Drill four: $\left[b-\right]$

| | | | | |
|---|---|---|---|---|
| teacher: | /'bi/ | /'ba/ | /'be/ | /'bu/ |
| student: | /'bi/ | /'ba/ | /'be/ | /'bu/ |

Drill five: $\left[-b\right]$

| | | | | |
|---|---|---|---|---|
| teacher: | /'ib/ | /'ab/ | /'eb/ | /'ub/ |
| student: | /'ib/ | /'ab/ | /'eb/ | /'ub/ |

Drill six: $\left[d-\right]$

| | | | | |
|---|---|---|---|---|
| teacher: | /'di/ | /'da/ | /'de/ | /'du/ |
| student: | /'di/ | /'da/ | /'de/ | /'du/ |

Drill seven: $\left[-d\right]$

| | | | | |
|---|---|---|---|---|
| teacher: | /'id/ | /'ed/ | /'ad/ | /'ud/ |
| student: | /'id/ | /'ed/ | /'ad/ | /'ud/ |

Drill eight: $\left[g-\right]$

| | | | | |
|---|---|---|---|---|
| teacher: | /'gi/ | /'gu/ | /'ge/ | /'ga/ |
| student: | /'gi/ | /'gu/ | /'ge/ | /'ga/ |

Drill nine: [-g]

    teacher:    /'ig/     /'eg/     /'ug/     /'ag/

    student:    /'ig/     /'eg/     /'ug/     /'ag/

Drill ten : Contrastive /p/ and /b/ in initial position

    teacher:    /'pa/     /'pi/     /'pe/     /'pu/
                /'ba/     /'bi/     /'be/     /'bu/

    student:    /'pa/     /'pi/     /'pe/     /'pu/
                /'ba/     /'bi/     /'be/     /'bu/

Drill eleven: Contrastive /p/ and /b/ in final position

    teacher:    /'ap/     /'ip/     /'ep/     /'up/
                /'ab/     /'ib/     /'eb/     /'ub/

    student:    /'ap/     /'ip/     /'ep/     /'up/
                /'ab/     /'ib/     /'eb/     /'ub/

Drill twelve: Contrastive /t/ and /d/ in initial position

    teacher:    /'ti/     /'te/     /'tu/     /'ta/
                /'di/     /'de/     /'du/     /'da/

    student:    /'ti/     /'te/     /'tu/     /'ta/
                /'di/     /'de/     /'du/     /'da/

Drill thirteen: Contrastive /t/ and /d/ in final position

    teacher:    /'it/     /'et/     /'at/     /'ut/
                /'id/     /'ed/     /'ad/     /'ud/

    student:    /'it/     /'et/     /'at/     /'ut/
                /'id/     /'ed/     /'ad/     /'ud/

Drill fourteen: Contrastive /k/ and /g/ in initial position

    teacher:    /'ki/     /'ke/     /'ka/     /'ku/
                /'gi/     /'ge/     /'ga/     /'gu/

    student:    /'ki/     /'ke/     /'ka/     /'ku/
                /'gi/     /'ge/     /'ga/     /'gu/

Drill fifteen: Contrastive /k/ and /g/ in final position

    teacher:    /'ak/     /'ek/     /'ik/     /'uk/
                /'ag/     /'eg/     /'ig/     /'ug/

    student:    /'ak/     /'ek/     /'ik/     /'uk/
                /'ag/     /'eg/     /'ig/     /'ug/

## 3.2. Fricatives

English employs voiceless labio-dental, inter-dental, alveolar, and alveo-palatal fricatives /f,θ,s,š/, and their voiced counterparts /v,d,z,ž/, any of which may occur in initial, medial, and final positions. Mandarin has counterparts to English /f,s,š/ and Formosan has /s/, but their priviledge of occurrence is limited to initial position only. Therefore the Mandarin speaker should not have difficulty in producing the voiceless fricative phonemes /f,s,š/ in initial position in English and he can transfer the Mandarin voiced retroflex alveolar fricative /ẓ/ to English /z/ with little difficulty; the Formosan speaker should not have trouble in producing the voiceless fricative /s/ in initial position in English, since both Mandarin and Formosan can employ their Chinese fricatives with acceptable results. They are also able to use their Chinese fricatives in English inter-vocalic situations by treating them as syllable initials.

Predictable problems for Mandarin and Formosan speakers with the fricative series arise in the production of any English fricative in inter-vocalic position, and in final position. Further, Mandarin has no counterparts to English fricatives /v,θ,d,ž/, thus the Mandarin speaker may be expected to have difficulty at first in producing /v,θ,d,ž/ in any position in English; the Formosan may have difficulty in producing /f,v,θ,d,z,š,ž/ in any position, because Formosan has no such counterparts. Experience shows that both Mandarin and Formosan commonly try to employ their Chinese /s/ for English /θ/, /d/ for /d/ etc. Formosans typically substitute their /hu/ for English /f/. (See under "Semi-vowels" in 3.7).

3.2.2.  A list of problems predicted:  Fricative series

Mandarin   1.   production of voiceless labio-dental fricative
/f/ in final position

2.   production of voiced labio-dental fricative /v/
in initial position

3.   production of voiced labio-dental fricative
/v/ in final position

4.   production of voiceless inter-dental fricative
/θ/ in initial position

5.   production of voiceless inter-dental fricative
/θ/ in final position

6.   production of voiced inter-dental fricative /ð/
in initial position

7.   production of voiced inter-dental fricative /ð/
in final position

8.   production of voiceless alveolar fricative /s/
in final position

9.   production of voiced alveolar fricative /z/ in
final position

10.  production of voiced alveo-palatal fricative /ž/
in inter-vocalic position

11.  production of voiced alveo-palatal fricative /ž/
in final position

12.  confusion of /v/ and /b/ in initial position

13.  confusion of /v/ and /b/ in final position

14.  confusion of /θ/ and /s/ in initial position

15. confusion of /θ/ and /s/ in final position

16. confusion of /ð/ and /d/ in initial position

17. confusion of /ð/ and /z/ in final position

18. confusion of /s/ and /z/ in final position

Formosan    1. production of voiceless labio-dental fricative /f/ in initial position

2. production of voiceless labio-dental fricative /f/ in final position

3. production of voiced labio-dental fricative /v/ in initial position

4. production of voiced labio-dental fricative /v/ in final position

5. production of voiceless interdental fricative /θ/ in initial position

6. production of voiceless inter-dental fricative /θ/ in final position

7. production of voiced inter-dental fricative /ð/ in initial position

8. production of voiced inter-dental fricative /ð/ in final position

9. production of voiceless alveolar fricative /s/ in final position

10. production of voiced alveolar fricative /z/ in initial position

11. production of voiced alveolar fricative /z/ in final position

12.  production of voiceless alveo-palatal fricative /š/
     in initial position

13.  production of voiceless alveo-palatal fricative /š/
     in final position

14.  production of voiced alveo-palatal fricative /ž/
     in inter-vocalic position

15.  production of voiced alveo-palatal fricative
     /ž/ in final position

16.  confusion of /v/ and /b/ in initial position

17.  confusion of /v/ and /b/ in final position

18.  confusion of /θ/ and /s/ in initial position

19.  confusion of /θ/ and /s/ in final position

20.  confusion of /ð/ and /d/ in initial position

21.  confusion of /ð/ and /z/ in final position

22.  confusion of /s/ and /š/ in initial position

23.  confusion of /s/ and /š/ in final position

24.  confusion of /s/ and /z/ in final position

Fries and Yao Shen (1948) suggest this sort of drill sequence for dealing with problems in the fricative series:

Drill sixteen: [f-]

| teacher: | /'fa/ | /'fiyt/ | /'fo/ | /'fayt/ |
| student: | /'fa | /'fiyt/ | /'fo/ | /'fayt/ |

Drill seventeen: [-f]

| teacher: | /'əf/ | /'biyf/ | /'def/ | /'ef/ |
| student: | /'əf/ | /'biyf/ | /'def/ | /'ef/ |

Drill eighteen: [v-]

| teacher: | /'və/ | /'vay/ | /'vi/ | /'vaw/ |
| student: | /'və/ | /'vay/ | /'vi/ | /'vaw/ |

Drill nineteen: [-v]

| teacher: | /'əv/ | /'fayv/ | /'keyv/ | /'seyv/ |
| student: | /'əv/ | /'fayv/ | /'keyv/ | /'seyv/ |

Drill twenty: [θ-]

| teacher: | /θə/ | /'θay/ | /'θɔt/ | /'θiyf/ |
| student: | /'θə/ | /'θay/ | /'θɔt/ | /'θiyf/ |

Drill twenty-one: [-θ]

| teacher: | /'əθ/ | /'feyθ/ | /'kiθ/ | /'baθ/ |
| student: | /'əθ/ | /'feyθ/ | /'kiθ/ | /'baθ/ |

Drill twenty-two: [ð-]

| teacher: | /'ði/ | /'ðæt/ | /'ðə/ | /'ðey/ |
| student: | /'ði/ | /'ðæt/ | /'ðə/ | /'ðey/ |

Drill twenty-three: [-ð]

| teacher: | /'tiyð/ | /'əð/ | /'tuwð/ | /'beyð/ |
| student: | /'tiyð/ | /'əð/ | /'tuwð/ | /'beyð/ |

Drill twenty-four: [-s]

| teacher: | /'əs/ | /'dis/ | /'piys/ | /'ays/ |
| student: | /'əs/ | /'dis/ | /'piys/ | /'ays/ |

Drill twenty-five: [s̍-]

| teacher: | /'s̍ə/ | /'s̍iy/ | /'s̍ey/ | /'s̍iyt/ |
| student: | /'s̍ə/ | /'s̍iy/ | /'s̍ey/ | /'s̍iyt/ |

Drill twenty-six: [-s̍]

| teacher: | /'is̍/ | /'es̍/ | /'as̍/ | /'us̍/ |
| student: | /'is̍/ | /'es̍/ | /'as̍/ | /'us̍/ |

Drill twenty-seven: [z-]

| teacher: | /'zə/ | /'zu/ | /'zi/ | /'ze/ |
| student: | /'zə/ | /'zu/ | /'zi/ | /'ze/ |

Drill twenty-eight: [-z]

| teacher: | /'əz/ | /'bəz/ | /'dowz/ | /'feyz/ |
| student: | /'əz/ | /'bəz/ | /'dowz/ | /'feyz/ |

Drill twenty-nine: [-ż-]

| teacher: | /'iżə/ | /'eżə/ | /'ażə/ | /'awżə/ |
| student: | /'iżə/ | /'eżə/ | /'ażə/ | /'awżə/ |

Drill thirty: [-ż]

| teacher: | /'iż/ | /'eż/ | /'aż/ | /'uż/ |
| student: | /'iż/ | /'eż/ | /'aż/ | /'uż/ |

Drill thirty-one: Contrastive /v/ and /b/ in initial position

| teacher: | /'bæt/ | /'biy/ | /'bowt/ | /'bə/ |
| | /'væt/ | /'viy/ | /'vowt/ | /'və/ |
| student: | /'bæt/ | /'biy/ | /'bowt/ | /'bə/ |
| | /'væt/ | /'viy/ | /'vowt/ | /'bə/ |

Drill thirty-two:  Contrastive /v/ and /b/ in final position

| teacher: | /'ib/ | /'əb/ | /'keyb/ | /'ab/ |
| | /'iv/ | /'əv/ | /'keyv/ | /'av/ |
| student: | /'ib/ | /'əb/ | /'keyb/ | /'ab/ |
| | /'iv/ | /'əv/ | /'keyv/ | /'av/ |

Drill thirty-three:  Contrastive /θ/ and /s/ in initial position

| teacher: | /'θə/ | /'θi/ | /'θay/ | /'θɔt/ |
| | /'sə/ | /'si/ | /'say/ | /'sɔt/ |
| student: | /'θə/ | /'θi/ | /'θay/ | /'θɔt/ |
| | /'sə/ | /'si/ | /'say/ | /'sɔt/ |

Drill thirty-four:  Contrastive /θ/ and /s/ in final position

| teacher: | /'əθ/ | /'uθ/ | /'paθ/ | /'fey / |
| | /'əs/ | /'us/ | /'pas/ | /'feys/ |
| student: | /'əθ/ | /'uθ/ | /'paθ/ | /'fey / |
| | /'əs/ | /'us/ | /'pas/ | /'feys/ |

Drill thirty-five:  Contrastive /d/ and /d/ in initial position

| teacher: | /'diy/ | /'dow/ | /'dey/ | /'dowz/ |
| | /'diy/ | /'dow/ | /'dey/ | /'dowz/ |
| student: | /'diy/ | /'dow/ | /'dey/ | /'dowz/ |
| | /'diy/ | /'dow/ | /'dey/ | /'dowz/ |

Drill thirty-six:  Contrastive /d/ and /z/ in final position

| teacher: | /'tiyd/ | /'tuwd/ | /'siyd/ | /'sayd/ |
| | /'tiyz/ | /'tuwz/ | /'siyz/ | /'sayz/ |
| student: | /'tiyd/ | /'tuwd/ | /'siyd/ | /'sayd/ |
| | /'tiyz/ | /'tuwz/ | /'siyz/ | /'sayz/ |

Drill thirty-seven:  Contrastive /s/ and /z/ in final position

| teacher: | /'bəs/ | /'fəs/ | /'ás/ | /'dows/ |
| | /'bəz/ | /'fəz/ | /'áz/ | /'dowz/ |
| student: | /'bəs/ | /'fəs/ | /'ás/ | /'dows/ |
| | /'bəz/ | /'fəz/ | /'áz/ | /'dowz/ |

## 3.3. Affricates

'An affricate is a stop with a release sufficiently slow to produce a momentary fricative effect before the next sound begins. For this reason, some phoneticians treat affricates as merely stop + fricative in close conjunction. There seems to be a difference, however, principally in length. The closure, or period of silence between closing and release, is much shorter in an affricate than in the corresponding stop, and the period of friction is shorter than the corresponding fricative, though longer than the usual release of a stop. Furthermore, the syllable break can not fall between the closure and the affrication. All these tend to produce an impression that the affricate is a single sound, rather than a combination of two.' (Francis, 1958, p. 79) English employs a voiceless alveo-palatal affricate /č/, and its voiced counterpart /ǰ/, either of which may occur in initial, medial, and final positions.

Both Mandarin and Formosan have counterparts to English voiceless affricate /č/, but their priviledge of occurrence is limited to initial position only, and they do not have counterparts to English voiced affricate /ǰ/. Thus we conclude that neither Mandarin nor Formosan speakers should have difficulty in producing the English affricate /č/ in initial position, since they are able to employ their Chinese voiceless alveo-palatal affricate /č/ with acceptable results, and they can also use their Chinese affricate in English inter-vocalic situations by considering them as syllable initials. Predictable problems for Mandarin and Formosan speakers with the affricate series arise in production of the English affricate /č/ in final position, and in the use of the English affricate /ǰ/ in all positions.

3.3.1. A list of problems predicted: Affricate series

Mandarin   1. production of voiceless alveo-palatal affricate /c̊/ in final position

2. production of voiced alveo-palatal affricate /j̊/ in initial position

3. production of voiced alveo-palatal affricate /j̊/ in final position

4. confusion of /c̊/ and /j̊/ in final position

Dormosan   1. production of voiceless alveo-palatal affricate /c̊/ in final position

2. production of voiced alveo-palatal affricate /j̊/ in initial position

3. production of voiced alveo-palatal affricate /j̊/ in final position

4. confusion of /c̊/ and /j̊/ in final position

Fries and Yao Shen advocate drills like the following for dealing with the affricates:

Drill thirty-eight: [-c̓]

 teacher: /ˈiyc̓/    /ˈkac̓/    /ˈdic̓/    /ˈsəhc̓/

 student: /ˈiyc̓/    /ˈkac̓/    /ˈdic̓/    /ˈsəhc̓/

Drill thirty-nine: [j̓-]

 teacher: /ˈj̓iyp/    /ˈj̓ab/    /ˈj̓owk/    /ˈj̓us/

 student: /ˈj̓iyp/    /ˈj̓ab/    /ˈj̓owk/    /ˈj̓us/

Drill forty: [-j̓]

 teacher: /ˈpeyj̓/    /ˈkeyj̓/    /ˈpehj̓/    /ˈj̓əj̓/

 student: /ˈpeyj̓/    /ˈkeyj̓/    /ˈpəhj̓/    /ˈj̓əj̓/

Drill forty-one: Contrastive /c̓/ and /j̓/ in final position

 teacher: /ˈeyc̓/    /ˈac̓/    /ˈuc̓/    /ˈawc̓/

      /ˈeyj̓/    /ˈaj̓/    /ˈuj̓/    /ˈawj̓/

 student: /ˈeyc̓/    /ˈac̓/    /ˈuc̓/    /ˈawc̓/

      /ˈeyj̓/    /ˈaj̓/    /ˈuj̓/    /ˈawj̓/

## 3.4. Nasals

All types of English make use of three distinct nasals: the bilabial, the alveolar, and the velar. All of them are customarily voiced and may be syllabic, that is, constitute the center or nucleus of a syllable. The bilabial nasal continuant /m/ and the alveolar /n/ may occur in initial, medial, and final positions, the velar /ŋ/ may occur in medial and final positions, but never in initial position.

Both Mandarin and Formosan have counterparts to English nasal continuants /m,n,ŋ/. The Mandarin nasal /m/ is used in initial position only, /n/ may occur in initial and final positions, and /ŋ/ is used in final position only. The Formosan nasals /m,n,ŋ/ may occur in initial and final positions.

Thus we conclude that the Mandarin speaker should not have difficulty in producing /m/ in initial position, /n/ in initial and final positions, /ŋ/ in final position in English. The Formosan speaker should not have difficulty in producing /m/ and /n/ in initial and final positions, and /ŋ/ in final position in English, since both Mandarin and Formosan can employ their Chinese nasal continuants; they also can use their Chinese nasals in English intervocalic situations by treating them as syllable initials. A predictable problem for Mandarin speakers with nasal series arise in the production of the English /m/ in final position.

3.4.1. Problem predicted: Nasal series

    Mandarin: production of voiced bilabial nasal continuant

              /m/ in final position

    Fries and Yao Shen suggest a drill like the following for reducing the problem:

Drill forty-two: [-m]

| teacher: | /'seym/ | /'biym/ | /'daym/ | /'kəm/ |
| --- | --- | --- | --- | --- |
| student: | /'seym/ | /'biym/ | /'kaym/ | /'kæm/ |

## 3.5. Lateral

'The English /l/ is typically produced with the tip of the tongue touching the alveolar ridge, the mid-part curving down-ward, and the back raised. The resulting schwa-colored /l/ causes any English vowel before /l/ to have an off-glide in the direction of mid-central.' (Engler, 1962: 83)  The /l/ in English is a voiced, alveolar lateral sound which may occur in initial, medial, and final positions. The /l/ in American English has two clearly disting-uishable allophones, commonly referred to as "clear" and "dark" /l/. 'The so called "clear /l/' is regular in most American English dialects in initial position and between a voiced consonant and following vowel. Examples of its occurrence are 'link, loot, glance, etc.' (Francis, 1958: 83)  'The voiced apico-alveolar coarticulation, [l], is the usual variety of so-called "dark" /l/, found after vowels and as a syllabic nucleus in English. Examples of usual positions of this sound are 'full, gulf, spelling, bottle, muscle, etc.' (Francis, 1958: 83-84)

Mandarin has a counterpart to English /l/. It may be described as a voiced apico-alveolar lateral, and it has only one allophone, the "clear" [l], which may occur in initial position only. It is produced in such a rapid fashion, however, that Americans often hear it as a 'flapped d'. This may be true of Formosans also, because in this writer's experience Formosan /l,d/ seem to be merging and found with increasing frequency in free variation.

Thus we conclude that a Mandarin should have no trouble in producing the English clear [l] initially before a front vowel--simply use the Chinese one-- but will have trouble with dark [l] in any position. A Formosan may have difficulty in producing the English /l/ in any position, and may confuse the English /l/ and /d/ in initial position.

3.5.1. A list of problems predicted: Lateral series

Mandarin: production of dark [l] in any position

Formosan: 1. production of clear [l] in pre-front vowel position

2. production of dark [ɫ] in other positions

3. confusion of /l/ and /d/ in initial position

Lado and Fries (1954) suggest a drill like the following for dealing with the lateral:

Drill forty-three: [l-]

    teacher:    /'liyv/       /'lak/       /'les/       /'luk/

    student:    /'liyv/       /'lak/       /'les/       /'luk/

Drill forty-four: [-l-]

    teacher:  /'teləfown/      /'fuwlis/       /'kilə/       /'selə/

    student:  /'teləfown/      /'fuwlis/       /'kilə/       /'selə/

Drill forty-five: [-l]

    teacher:   /'dəl/      /'piyl/       /'powl/       /'fel/

    student:   /'dəl/      /'piyl/       /'powl/       /'fel/

Drill forty-six:  Contrastive /l/ and /d/ in initial position

    teacher:   /'lay/     /'low/      /'liyd/       /'liy/

               /'day/     /'dow/      /'diyd/       /'diy/

    student:   /'lay/     /'low/      /'liyd/       /'liy/

               /'day/     /'dow/      /'diyd/       /'diy/

## 3.6. Retroflex

The English /r/ is a voiced, alveolar retroflex which may occur in initial, medial, and final positions. 'The [r] sound is pronounced by raising the tip of the tongue toward the top of the mouth. The tongue does not touch the top of the mouth.' (Lado and Fries, 1958: 50) When /r/ precedes vowels in initial position, 'the tip of the tongue is turned up sharply toward the palate and the lips are rounded. Voicing begins and the tip of the tongue lowers to produce the vowel which follows [r]; the voiced sound is continuous during the pronunciation of [r] and the vowel which follows [r]'. (Lado and Fries, 1958: 78) When /r/ follows vowels, 'the tip of the tongue turns up toward the palate and the lips are slightly rounded. The voiced sound is continuous from the vowel sound to the [r] sound which follows it.' (Lado and Fries, 1958: 78)

There seems to be room for further discussion of the phonemic status of /r/ for Mandarin. Such writers as Chao (1948), Shen (1949), and Wong (1953) felt that /r/ could occur not only finally, but also initially where it was given a flapped articulation. This would help account for the fact that Mandarin speakers so often confuse English /l r/, but it does not account for the lack of a flapped [ř] in initial position in this writer's experience in more current Mandarin nor the occurrence of /z̧, dz̧/. Formosan, on the other hand, clearly has no counterpart to English /r/.

Therefore we conclude that the Mandarin speaker should have no difficulty in producing the English /r/ in final position, since he can employ his Chinese retroflex with quite acceptable results. Predictable problems for Mandarin speakers arise in the production of the English /r/ in initial and intervocalic positions, and for Formosan in all positions. Furthermore,

experience shows that both Mandarin and Formosan speakers commonly try to employ their Chinese /l/ for the English /r/ in initial and inter-vocalic positions, additionally that Formosan /l/ may be realized as [l] or [d] in free variation. (cf. 3.5. above)  Some Formosans would substitute their /d/ for English /r/ in initial position.

3.6.1.  Note on teaching English /r,l/ to Mandarin and Formosan speakers

A very effective pedagogical device for many teachers in instilling the /r,l/ contrast emphasizes the point that in the production of /l/ the tongue touches the roof of the mouth, whereas in /r/ it does not.  An articulation diagram for each articulation provides a useful visual reference to be used as needed until students have reduced the discrimination to habit.
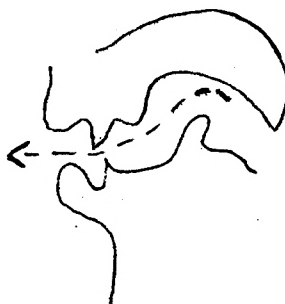
[l]                    [r]

3.6.2. A list of problems predicted: Retroflex series

| | | |
|---|---|---|
| Mandarin | 1. | production of the retroflex /r/ in initial position |
| | 2. | production of the retroflex /r/ in inter-vocalic position |
| | 3. | confusion of /r/ and /l/ in initial position |
| | | |
| Formosan | 1. | production of the retroflex /r/ in initial position |
| | 2. | production of the retroflex /r/ in inter-vocalic position |
| | 3. | production of the retroflex /r/ in final position |
| | 4. | confusion of /r/ and /l/ in initial position |
| | 5. | confusion of /r/ and /l/ in final position |
| | 6. | confusion of /r/ and /d/ in initial position |

Fries and Yao Shen suggest a drill for dealing with the retroflex as follows:

Drill forty-seven:  [r-]

    teacher:    /'red/     /'ray/     /'ruwt/    /'rey/

    student:    /'red/     /'ray/     /'ruwt/    /'rey/

Drill forty-eight:  [-r]

    teacher:    /'awr/     /'pir/     /'towr/    /'fɔr/

    student:    /'awr/     /'pir/     /'towr/    /'fɔr/

Drill forty-nine:  Contrastive /r/ and /l/ in initial position

    teacher:    /'lay/     /'low/     /'liyp/    /'leyt/    /'liyd/

                  /'ray/     /'row/     /'riyp/    /'reyt/    /'riyd/

    student:    /'lay/     /'low/     /'liyp/    /'leyt/    /'liyd/

                  /'ray/     /'row/     /'riyp/    /'reyt/    /'riyd/

Drill fifty:  Contrastive /r/ and /l/ in final position

    teacher:    /'bil/     /'pul/     /'ayl/    /'bɤl/    /'ɔl/

                  /'bir/     /'pur/     /'ayr/    /'bɔr/    /'ɔr/

    student:    /'bil/     /'pul/     /'ayl/    /'bɔl/    /'ɔl/

                  /'bir/     /'pur/     /'ayr/    /'bɔr/    /'ɜr/

Drill fifty-one:  Contrastive /r/ and /d/ in initial position

    teacher:    /'ray/     /'row/     /'riyd/    /'red/

                  /'day/     /'dow/     /'diyd/    /'ded/

    student:    /'ray/     /'row/     /'riyd/    /'red/

                  /'day/     /'dow/     /'diyd/    /'ded/

## 3.7.  Semi-vowels

Semi-vowels are so called because they function as vowels some of the time and as consonants some of the time.  'From an articulatory viewpoint, /w,y,h/ are similar to fricatives, but from a distribution viewpoint it is more convenient to class them separately.  In pre-vocalic position in the same syllable with following vowel, they function like consonants; but in post-vocalic position in the same syllable with preceding vowel, they function as vocalic off-glides.' (Engler, 1962: 10)  Here we are concerned with semi-vowels only when they function as consonants.

In English, the semi-vowels /w,y,h/ function as consonants before vowels, as in 'west, yes, him, squeeze, cute'.  Since both Mandarin and Formosan have counterparts to the English semi-vowels, and since they also function as consonants only before vowels, both Chinese speakers should be able to employ their Chinese semi-vowels in English consonant function with satisfactory results, except in consonant clusters /skw-, sky-, spy-, kw-, ky-, etc./, (see 3.8 below) and experience bears this out.

As noted in 3.2. above, however, Formosans typically substitute their /hu/ for English /f/.  Some writers posit unit phonemes /$k^w$, $g^w$, $h^w$/ for Mandarin and Formosan (Alice Chang, 1967, Jocelyn Lin, 1968.) which would account for this problem, in that the Formosan could then be said to be using the one fricative he has with labial quality to approximate the English labio-dental fricative /f/ in preference to using his only other fricative, namely /s/.  This writer would prefer to believe that Formosan /$k^w$, $g^w$, $h^w$/ are in reality CV sequences of /ku, gu, hu/.  On this basis, the argument would be that the Formosan is substituting his CV /hu/ for English labio-dental fricative /f/ as the place factors in this articulatory position.

## 3.7.1. Problem predicted: Semi-vowel series

Formosan:    confusion of /hu/ and /f/ in initial position

Drill fifty-two: Contrastive /hu/ and /f/ in initial position

| teacher: | /'huay/ | /'huey/ | /'huiyt/ | /'huows/ |
|---|---|---|---|---|
|  | /'fay/ | /'fey/ | /'fiyt/ | /'fows/ |
| student: | /'huay/ | /'huey/ | /'huiyt/ | /'huows/ |
|  | /'fay/ | /'fey/ | /'fiyt/ | /'fows/ |

## 3.8. Consonant clusters

A group of two or more consonants joined together is called a consonant cluster. English employs consonant clusters in initial, medial, and final positions. It is impossible to establish syllable boundaries on any but an arbitrary basis for English, but in terms of monosyllabic words, canonical forms include clusters to the extent of at least CCCVCCC. (cf. Scott, 1966)

Since neither Mandarin nor Formosan phonotactics permit of more than one consonant without a syllable boundary between (and even then the first can be only /n or ŋ/), students face difficulties in producing clusters in any position. They typically attempt to separate contiguous consonants with an epenthetic vowel, thus making an extra syllable with the second consonant of the cluster the initial consonant of the second syllable. For example, English 'next' is typically rendered /nékəsətə/. Note in this example the additional problem of the epithetic vowel in the final position occasioned by the fact that Chinese /t/ can not occur in final position.

In this writer's experience, the best way to proceed in helping both Mandarin and Formosan speakers produce English clusters is to begin with two-consonant clusters, having the student produce the first in isolation, then a juncture, then the second as syllable initial, shortening the juncture successively until the two consonants are to an acceptable degree contiguous. e.g., /'spay/ the initial /sp/ can be elicited by telling the students to pronounce a long /sss/, which they can do well, and then to add /pay/. The process is repeated with shorter and shorter /s/ until a deliberate but satisfactory /'spay/ finally emerges.

'As in the case of initial clusters, final clusters in English are char-
acterized by very close transition from one consonant sound to the next. This
can best be practiced by starting with the shorter clusters and building up
(e.g. rang, rank, rankle, rankles can form a chain); and by practicing in
slow motion at first-pronouncing each sound in the cluster slowly (except for
the plosives, which cannot be slowed down), but not allowing any other sounds
to intrude.' (Harold B. Allen, p. 119-20)

3.8.1. A list of problems predicted: Consonant cluster series

Mandarin 1. production of any English consonant clusters in initial position

2. production of any English consonant clusters in medial position

3. production of any English consonant clusters in final position

Formosan 1. production of any English consonant clusters in initial position

2. production of any English consonant clusters in medial position

3. production of any English consonant clusters in final position

3.8.2. The following is a list of English consonant clusters which give difficulties to both Mandarin and Formosan speakers:

a. Initial consonant clusters in two phonemes

| /pl-/ | please | /fl-/ | fly |
|-------|--------|-------|-----|
| /pr-/ | pray | /fr-/ | fry |
| /tr-/ | try | /θr-/ | through |
| /tw-/ | twice | /sl-/ | slow |
| /kl-/ | class | /sm-/ | small |
| /kr-/ | crew | /sn-/ | snow |
| /kw-/ | quick | /sp-/ | speed |
| /bl-/ | blue | /st-/ | steak |
| /br-/ | bread | /sk-/ | sky |
| /dr-/ | dry | /sr-/ | shrimp |
| /gl-/ | glide | /sw-/ | sweet |
| /gr-/ | green | | |

b. Initial consonant clusters in three phonemes

| /spl-/ | splendid |
|--------|----------|
| /spr-/ | spring |
| /str-/ | strong |
| /skr-/ | scream |
| /skw-/ | square |

c. Medial consonant clusters in two phonemes

| /-pl-/ | apply |
|--------|-------|
| /-pr-/ | appreciate |
| /-bl-/ | doubling |
| /-br-/ | abroad |

| /-kl-/ | o'clock |
|---|---|
| /-kr-/ | across |
| /-gr-/ | degree |
| /-fl-/ | afflict |
| /-fr-/ | afraid |
| /-ml-/ | homely |

d.  Medial consonant clusters in three phonemes

| /-str-/ | illustrate |
|---|---|
| /-ksp-/ | expire |
| /-mpl-/ | employee |
| /-mbr-/ | embrace |
| /-mpt-/ | empty |
| /-mbr-/ | embroil |
| /-ntr-/ | control |
| /-mps-/ | consumption |
| /-ŋkw-/ | conquest |
| /-ŋgr-/ | congress |

e.  Final consonant clusters in two phonemes

| /-bd/ | rubbed | | /-gz/ | begs |
|---|---|---|---|---|
| /-bz/ | rubs | | /-ks/ | box |
| /-dz/ | seeds | | /-kt/ | pact |
| /-dθ/ | width | | /-lb/ | bulb |
| /-fs/ | laughs | | /-ld/ | hold |
| /-ft/ | soft | | /-lf/ | self |
| /-fθ/ | fifth | | /-lk/ | milk |
| /-gd/ | begged | | /-lm/ | film |

| | | | | |
|---|---|---|---|---|
| /-ln/ | kiln | | /-ps/ | collapse |
| /-lp/ | help | | /-pt/ | apt |
| /-ls/ | else | | /-pθ/ | depth |
| /-lt/ | belt | | /-sk/ | ask |
| /-lv/ | shelve | | /-sp/ | wasp |
| /-lz/ | bells | | /-st/ | test |
| /-l / | wealth | | /-vd/ | lived |
| /-md/ | climbed | | /-zd/ | pleased |
| /-mf/ | triumph | | /-nd/ | hanged |
| /-mp/ | camp | | /-nk/ | drink |
| /-mt/ | prompt | | /-nz/ | rings |
| /-mz/ | comes | | /-ŋθ/ | strength |
| /-mθ/ | warmth | | /-st/ | washed |
| /-nd/ | bend | | /-zd/ | rouged |
| /-ns/ | tense | | /-θs/ | berths |
| /-nt/ | tent | | /-θt/ | berthed |
| /-nz/ | bronze | | /-ɖd/ | bathed |
| /-nθ/ | month | | /-ɖz/ | bathes |

f.  Final consonant clusters in three phonemes

| | | | | |
|---|---|---|---|---|
| /-bld/ | troubled | | /-fnt/ | elephant |
| /-blz/ | troubles | | /-fnz/ | softens |
| /-dzd/ | judged | | /-fts/ | lifts |
| /-dθs/ | widths | | /-ftθ/ | fifth |
| /-fld/ | shuffled | | /-gld/ | struggled |
| /-flz/ | shuffles | | /-glz/ | struggles |
| /-fnd/ | softened | | /-kld/ | tackled |

| | | | | |
|---|---|---|---|---|
| /-klz/ | tackles | | /-mfs/ | triumphs |
| /-ksl/ | axle | | /-mft/ | triumphed |
| /-kst/ | text | | /-mps/ | camps |
| /-ksθ/ | sixth | | /-mpt/ | prompt |
| /-kts/ | acts | | /-mpθ/ | warmth |
| /-lbz/ | bulbs | | /-ndz/ | hands |
| /-ldz/ | builds | | /-ndž/ | change |
| /-lfs/ | wolf's | | /-nst/ | against |
| /-lft/ | wolfed | | /-nts/ | wants |
| /-lfθ/ | twelfth | | /-nθs/ | months |
| /-lks/ | milks | | /-pθs/ | depths |
| /-lkt/ | milked | | /-sks/ | asks |
| /-lmd/ | filmed | | /-skt/ | asked |
| /-lmz/ | films | | /-sps/ | wasps |
| /-lnz/ | kilns | | /-spt/ | gasped |
| /-lps/ | helps | | /-sts/ | masts |
| /-lpt/ | helped | | /-ŋks/ | banks |
| /-lst/ | waltzed | | /-ŋkt/ | banked |
| /-lts/ | belts | | /-ŋkθ/ | strength |
| /-lvd/ | shelved | | /-ŋθs/ | lengths |
| /-lθs/ | healths | | | |

Summary

1. English stops may occur in initial, medial, and final positions, but Mandarin and Formosan stops may occur in initial position only.

2. English fricatives may occur in initial, medial, and final positions, but Mandarin and Formosan fricatives may occur initially only.

3. English affricates may occur in initial, medial, and final positions, but Mandarin and Formosan affricates may occur initially only.

4. English nasals /m,n/ may occur in initial, medial, and final positions, /ŋ/ occurring medially and finally.  Mandarin nasal /m/ may occur in initial position only, /n/ in initial, and final positions, /ŋ/ in final position only.  Formosan nasals /m,n,ŋ/ may occur in initial and final positions.

5. English lateral /l/ may occur in initial, medial, and final positions, but Mandarin and Formosan laterals may occur in initial position only.

6. English retroflex /r/ may occur in any position, but Mandarin /r/ may occur in final position only and Formosan does not have a counterpart phoneme.

7. English semi-vowels function as consonants in initial position before vowels, as do Mandarin and Formosan semi-vowels.

8. English consonant clusters may occur in any position, but Mandarin and Formosan must have a vowel between any two consonants.

# FOOTNOTES

1. Trager, George L. and Henry Lee Smith, Jr. <u>An Outline of English Structure</u>. Studies in Linguistics, Occasional Papers 3. 1951. Reprinted Washington, D.C. : American Council of Learned Societies, 1957., p. 29-35.

2. Na, Chong-sun. <u>Standard Mandarin Pronunciation</u>. Taiwan Kai-ming Book Co., 1968, p. 30-36.

3. The writer's own research of Formosan dialect with the Formosan Student Association at Kansas State University.

# REFERENCES CITED

Allen, Harold Boughton. ed. Readings in Applied English Linguistics.
    New York: Appleton-Century-Crofts, 1964.

_____. Teaching English As a Second Language: A Book of Readings.
    McGraw-Hill Book Co., 1965.

Allen, Virginia French. ed. On Teaching English to Speakers of Other
    Languages. National Council of Teachers of English, Champaign,
    Illinois, 1965.

Bloomfield, Leonard. Language. New York: Henry Holt & Co., 1933.

Bronstein, Arthur J. The Pronunciation of American English.
    New York: Appleton-Century American Crofts, 1960.

Brooks, Nelson. Language and Language Learning. New York:
    Harcourt, Brace and World, Inc., 1960.

Chang, Alice A. C. "Teaching English Phonology to Speakers of the Formosan
    Dialect of Chinese". unpub. master's report, Kansas State University,
    Manhattan, Kansas, 1967.

Chao, Yuen Ren. Mandarin Primer. Harvard University Press, 1948.

Cheng, Robert L. "Mandarin Phonological Structure." JL 2:2, 1966.

Davidson-Nielsen, N. "English Stops After Initial /s/."
    English Studies., 1969, 50(4), 321-339.

Engler, Leo Francis. "Problems in English/German Contrastive Analysis."
    Unpub. Doctoral Diss., The University of Texas, Austin, Texas, 1962.

_____. "Basic Tenets in an Audio Lingual Approach to Teaching
    Spoken English." Unpub. Paper, Delivered at the National TESOL convention,
    New York, 19 March 1966.

Francis, Winthrop Nelson. The Structure of American English.
    New York: The Ronald Press Co., 1958.

Fries, Charles Carpenter. Teaching and Learning English as a Foreign
    Language. Ann Arbor: The University of Michigan Press, 1945.

_____. and Yao Shen. Intensive Course in English for Chinese Students.
    Ann Arbor: The University of Michigan Press, 1948.

_____. Lessons in Pronunciation: Exercise manual accompanying
    Intensive Course in English for Chinese Students, University of Michigan
    Press, 1948.

Gleason, H. A., Jr.  *An Introduction to Descriptive Linguistics.*
    New York: Holt, Rinehart & Winston, 1961.

Harms, Robert T.  *Introduction to Phonological Theory.*
    Englewood Cliffs: Prentice-Hall, 1968.

Heffner, RM. S.  *General Phonetics.*
    The University of Wisconsin Press, 1950.

_____.  "Language Analysis and Language Teaching."
    *MLA,* 40, 1956.

Hill, Archibald A.  *Introduction to Linguistic Structures:  From Sound
    to Sentence in English.*  New York: Harcourt, Brace & World, Inc.,
    1958.

Huang, Raymond.  *Mandarin Pronunciation.*  Hong Kong University Press, 1969.

Joos, Martin. ed.  *Readings in Linguistics.*  New York: ACLS, 1958.

Jones, Daniel.  *The Pronunciation of English.*  Cambridge, England:
    W. Heffer & Sons, Ltd., 1956.

_____.  *An Outline of English Phonetics.*  Cambridge, England:
    W. Heffer & Sons, Ltd., 1956.

Kantner, Claude E. and Robert West.  *Phonetics.*  New York: Harper and
    Brothers Publishers, 1960.

Lado, Robert.  *Linguistics Across Cultures.*  Ann Arbor:  The University
    of Michigan Press, 1957.

_____.  and Charles C. Fries.  *English Pronunciation.*
    The University of Michigan Press, 1958.

_____.  *Language Teaching: A Scientific Approach.*
    McGraw-Hill, Inc., 1964.

Lin, Jocelyn C-Z.  "Phonological Problems in Teaching English to Mandarin
    Speakers with Special Reference to /l r/."  Unpub. Master's Report,
    Kansas State University, Manhattan, Kansas, 1968.

Malmberg, Bertil.  *Phonetics.*  New York: Dover Publications, 1963.

Marckwardt, Albert H.  *Linguistics and Teaching of English.*
    Indiana University Press, 1966.

Na, Chong-sun.  *Standard Mandarin Pronunciation.*  Taiwan, Kai-ming Book Co.,
    1968.

Pike, Kenneth L. Phonemics: A Technique for Reducing Languages to Writing. Ann Arbor: The University of Michigan Press, 1947.

Politzer, Robert L. Foreign Language Learning. Englewood Cliffs, N. J.: Prentice-Hall Inc., 1965.

Saunders, W. A. "The Teaching of English Pronunciation to Speakers of Hokkien." Language Learning, 12, 1963.

Scott, Charles T. Preliminaries to English Teaching. Tokyo: The English Education Council, Inc., 1966.

Shen, Yao. "Initial /r/ in American English and Mandarin Chinese and How to Teach It." Language Learning. 2:2, 47-55, 1949.

_____. "Sound-arrangement and Sound-sequence." Language Learning., 11:1 & 2, 1963.

Stageberg, Norman C. An Introductory English Grammar. New York, 1968.

Thomas, Charles K. An Introduction to the Phonetics of American English. New York, 1958.

Trager, George L. and Henry Lee Smith, Jr. An Outline of English Structure. Studies in Linguistics, Occasional Papers 3. 1951. Reprinted Washington D.C.: American Council of Learned Societies, 1957.

Wang, Yu-te. The Basic Vocabulary of the Formosan Dialect. Japan: Eiwa Language Institution, 1957.

Wise, Claude M. Introduction to Phonetics. New Jersey: Prentice-Hall, Inc., 1960.

Wong, Helen. "Outline of the Mandarin Phonemic System." Word, 9, 268-276, 1953.

A REVIEW OF ENGLISH CONSONANTAL PHONOLOGY FOR

HIGH SCHOOL ENGLISH TEACHERS IN TAIWAN


by


CLIFFORD H. F. HSU

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AN ABSTRACT OF A MASTER'S REPORT


Submitted in partial fulfillment of the

requirements for the degree


. MASTER OF ARTS


Department of Speech


KANSAS STATE UNIVERSITY
Manhattan, Kansas


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# ABSTRACT

Purpose: This report is an attempt to collect and synthesize some of the otherwise atomistically distributed information on dealing with problems in pronunciation of English consonants encountered by both Mandarin and Formosan speakers, for the convenience of junior and senior high school teachers in Taiwan. Certainly teaching English phonology is one of the most difficult jobs for the teachers of English to both Mandarin and Formosan students.

Procedure: The procedure of this report is essentially in three steps;

1. Introduce English, Mandarin, and Formosan phonemic inventories.

2. By means of contrastive analysis to find gross phonemic differences between English/Mandarin and English/Formosan, and note the nature of the differences.

3. Point out the problems faced by both Mandarin and Formosan speakers, and suggest drills to reduce each problem.

Summary of Findings: In contrastive analysis, we find that the sources of difficulty lie in points of differences in the phonemic systems and in the distributions of each sound and in the arrangements of two languages. The following are the main findings;

1. English has stops /p,t,k,b,d,g/.

   Formosan has counterparts to all of them, but Mandarin has only /p,t,k/.

2. English stops may occur in initial, medial, and final positions.

   Both Mandarin and Formosan stops may occur in initial position only.

3. English has fricatives /f, ,s,š,v,ð,z,ž/.

   Mandarin has /f,s,ş,š,z/, and Formosan has /s/ only.

4. English fricatives may occur in any position.

   Mandarin and Formosan fricatives may occur initially only.

5. English has affricates /č/ and /ǰ/.

   Mandarin and Formosan have /č/ only.

6. English affricates may occur in all positions.

   Mandarin and Formosan affricates may occur in initial position only.

7. English has nasals /m,n,n/.

   Mandarin and Formosan have counterparts to them, and Formosan has an additional nasal /ñ/.

8. English /m,n/ may occur in any position, /ŋ/ in medial and final positions.

   Mandarin /m/ may occur initially only, /n/ in initial and final positions, /ŋ/ in final position only; Formosan /m,n,ñ,ŋ/ may occur in initial and final positions.

9. English has a lateral /l/.

   Mandarin and Formosan have counterparts to it.

10. English lateral may occur in any position.

    In both Mandarin and Formosan laterals may occur in initial position only.

11. English has semi-vowels /w,y,h/.

    Both Mandarin and Formosan have counterparts to them.

12. English semi-vowels function as consonants before vowels, as do Mandarin and Formosan semi-vowels.

13. English has consonant clusters, and may employ clusters in any position, but Mandarin and Formosan have no clusters.