

## Chapter IV

### CONCLUSIONS AND DISCUSSIONS

The findings of the experiment on speech perception which were discussed in chapter 3 with reference to previous studies and the hypotheses outlined in the introductory section can be concluded into four main points:

- (1) the perception of each fricative sound pair: phonemic sound pair (f-s), non-phonemic sound pair (e-f), phonemic and non-phonemic sound pairs (f-e, f-f, s-e, and s-f),
- (2) the speech perception ability which is effected by the subjects' language background as related to age and the amount of time exposure to English language,
- (3) the subjects' perception ability effected by age,
- (4) the subjects' perception ability effected by different ISI levels related to age.

#### 4.1 CONCLUSIONS

##### 4.1.1 The Perception of the English Fricative Sounds in Thai Children

The Thai children's ability in the discrimination of each sound pair is different. The best subjects' performance is the

perception of the non-phonemic sound pair instead of the phonemic sound pair. Thus, the hypothesis which claimed that the perception of the phonologically relevant sounds is better than the phonologically irrelevant sounds is not supported. The result indicated that in the discrimination of fricative sounds, the physical properties of sounds play an important role in the perception of sounds as well as the acquaintance of the subjects to the sounds used in the experiment (see detailed discussion in 3.2.2.2.1).

#### 4.1.2 The Subjects' Perception Ability and Language Background

The result of the perception ability of the 4 subject groups showed the enhancement of the perception ability of English sounds effected by the exposure to English language. The contribution of second language learning on perception ability was found only in the TE- 8 group. On the other hand, there is no contribution of English language learning on the perception ability of the TE-6 group. The explanation of the unexpected result of the perception of the TE-6 group may be that the perception of the TE- 6 group was effected by the confusion of the subjects themselves due to starting to learn a second language at the same time as starting to read and write Thai language.

#### 4.1.3 The Subjects' Perception Ability and Age

It was found that the elder group (T-8 and TE-8) had better discrimination than the younger group (T-6 and TE-6), indicated that age was a factor which have an effect on the children's perception ability. In the earlier literature (Burnham, 1986) proposed that there was a Phonological Bias to the perception of non-phonemic sounds in children age 6 years old which was the age around the time children begin to formally acquire their mother tongue language skills.

#### 4.1.4 Phonetic and Phonemic Factors in Speech Perception

It is apparent that the effect of different ISI levels on the subject's perception ability, which was found in this experiment, is related to age. The younger subjects had better discrimination ability in the ISI 500 ms than in the ISI 1500 ms whereas the elders had better discrimination ability in the ISI 1500 ms than in the ISI 500 ms. This result seems to be due to the subjects' speech processing strategy in the perception of sound pairs. It is suggested here that the Thai children age 6 years old has better phonetic processing of English fricative sounds than the phonemic processing of the English fricatives. This phenomenon may be due to the Phonological Bias Theory i.e. in processing English sounds at the phonological level, there is an interference of Thai phonology to their perception.

## 4.2 FURTHER DISCUSSIONS

There are two major topics of this experiment which will be discussed as follow:

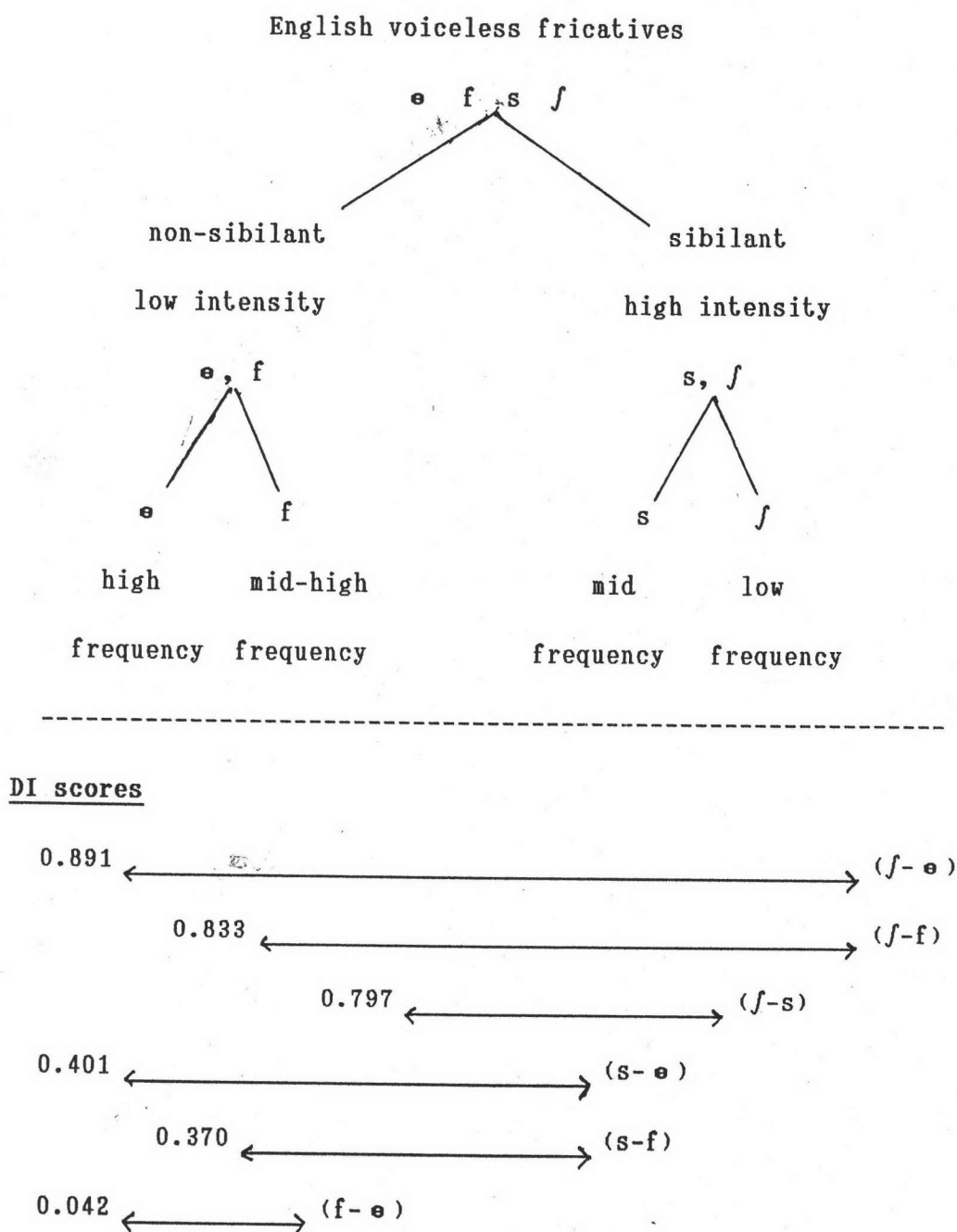
### 4.2.1 Phonetic Realization of Sounds and Discrimination Ability

It was discussed earlier (3.2.2.2.1) that the discrimination scores of each sound pair were related to the differences between the members of the sound pairs. And the physical properties which play a role in the discrimination were intensity and frequency of sounds. The more the difference between the members of each sound pair, the better the discrimination ability of the sound pair was.

The discrimination index (DI) scores of each sound pair in Table 3.5 were listed from high to low scores, three best discrimination scores were found in the sound pairs which had /f/ as a member: DI .891 for (e-f), DI .833 for (f-f), DI .797 for (s-f). This was followed by two sound pairs which had /s/ as a member: DI .401 for (s-e), and DI .370 for (f-s). The worst discrimination score was found in the (f-e) sound pair: DI .042. Considering the DI scores and acoustic features of the fricative sounds used in this experiment (Table 3.5 and Figure 3.4), it can be suggested here that the discrimination scores of each sound pair were related to the acoustic distance between the members of the sound pairs, that is, the farther the distance between the members of the sound pair, the higher the

discrimination score of the sound pair is. This is illustrated in Figure 4.1 below. (This figure is a combination of Table 3.5 and Figure 3.4 in page 72 and 74 accordingly.)

Figure 4.1 The Discrimination Indices and the Acoustic Distance of the Members of Sound Pairs



Although it is apparent from this experiment that the perception of fricative sounds depend on their physical properties, the mean DI score of the (f-s) sound pair is noteworthy. These two sounds are both phonologically significant in Thai and English language. Earlier literature reported that in learning mother tongue or the native language, learners could clearly define and reorganize the sounds which are relevant in their language into phoneme (Werker & Tees, 1984a) and the sounds which are not relevant become less accessible. Thus, it should have been easier for Thai children to discriminate (f-s) which are phonologically relevant sounds than phonologically irrelevant sounds: the NP and PNP pairs. However, no such finding was found in this experiment with the discrimination of fricatives. Earlier literature on the perception of stops (Burnham, O'Connor, Clark, & Earnshaw, 1985; Burnham, O'Connor, & Earnshaw, 1986) had a different result. This suggests that the phonetic class of sounds, i.e. stops or fricatives or others, may play a role in the perception of sounds.



This experiment shows that the children have difficulty to discriminate the P sound pair (f-s). This can be explained in terms of the difference of phonetic realization (Abercrombie, 1975)\* of the significant sound used in different languages.

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\* Abercrombie presented four respects in which the segmental features of related accents of a language can differ from each other.

1. Structural differences: the different occurrence of a phoneme which form structure such as syllables or words. It includes the restrictions or limitations of a phoneme to combine or to occur with other phonemes.

2. Systemic differences: the difference of the number of phonemes used in the languages.

3. Distribution differences: the difference of the way phonemes are distributed in words, the same word may has different phonemes. For example, the word houses, one might has intervocalic /s/ while the other has /z/.

4. Differences of Phonetic realization: the different pronunciation of the same phoneme. The same phoneme which used in two languages may sound different from each other, however, there is no systemic or structural difference "... they sound different from each other because they have different phonetic realizations for some or all of the items in the systems."

Two different languages are able to have the same set of sounds used in each language but that same set of sounds may have different phonetic realizations. That is in the phonemic level, those languages may have the same set of significant sounds in their phonological system but the phoneme may have several members which are referred as "allophones". Those allophones of the same phoneme may have different phonetic properties which do not differentiate meaning of a word in a language. The /s/ and /f/ phonemes in Thai are reported to have many members: (1) the phoneme /s/ has many allophones: apico-alveolar [s], lamino-dental flat [e], lamino-dental grooved [s̺], denti-alveolar grooved [s̺], and lamino-alveolar velarized grooved [s̺̠], (2) the phoneme /f/ has two allophones: labio-dental [f], and labio-dental velarized [f̠] (Harris, 1972). Thai children may have had perceived the sounds used in this experiment before. We also do not know what are the phonetic realizations of the English /f/, /e/, /s/ and /ʃ/ the Thai teachers pronunciation. The discrimination abilities of the subjects may be related to the phonetic realizations of the phonemes used by their peers, their teachers and their family. This question needs to be further explored.



#### 4.2.2 Second Language Learning and Discrimination Ability

There are two different theories about the beginning age of second language learning which were claimed by the studies of second language learning. The first theory came from Penfield (1963)\* and Lennenberg (1967)\* who claimed that the earlier the children expose to second language, the better they succeed in learning, they also claimed that children younger than 13 years old are able to learn a second language much more easily than those older than 13 years old. The second theory came from Stern (1976)\* who suggested that early and late exposure to second language have both advantages and disadvantages. Although the theories are still debatable, the discrimination ability of the four subject groups reported in this experiment seems to support the first theory.

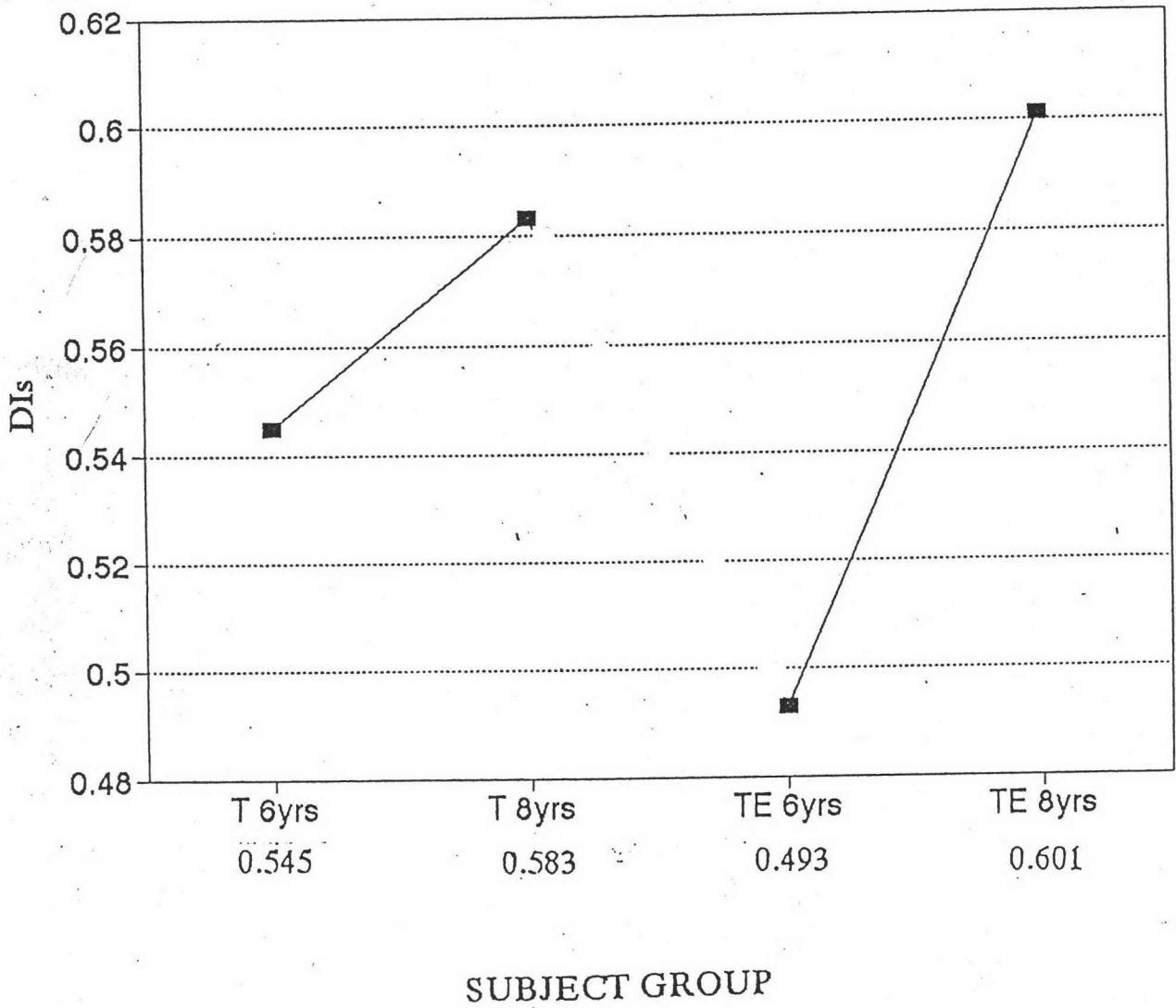
(See Figure 4.2.)

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\* quoted in Scovel, 1988.

Figure 4.2

## The subject's perception ability



According to Figure 4.2 which was rewritten from Figure 3.1, there is a sharp rise of the discrimination ability in the TE-6 to TE- 8 groups whereas the rise in the the T-6 to T- 8 groups is not as sharp. It seems that early exposure to second language at age 6 years old has a good effect on the discrimination ability of children age 8 years old. The subjects age 8 years old who were exposed to both languages had better discrimination abilities than the subjects age 8 years old who were exposed to only one language. The higher discrimination ability of TE- 8 group than the discrimination of T- 8 group indicated that learning two languages could have a contribution to their discrimination ability. Longitudinal study on the discrimination abilities of the two subject groups is recommend for future research.

#### 4.3 RECOMMENDATION FOR FURTHER RESEARCH

In order to expand the fricative perception study, investigation of other fricative sounds with children of several age groups across languages is recommended. Such study will help to confirm the hypothesis proposed here that in the perception of fricatives, physical properties of the sounds play a major role.

Investigation on the discrimination ability of fricatives in English subjects, using the same set of sound pairs, should be repeated to confirm the findings reported in this study.