

Chapter 5 Discussion

5.1 Discussion on the nonword classification task

As to the nonword classification task, I adopt the design in the study of Walley et al. (1986) to investigate the role of syllables and phonemes in detecting the similarity of the speech sounds. In the nonword classification task, children are asked to classify the speech sounds according to the standard sounds. This experiment requires children's ability of phonemic analysis and syllabic analysis to detect the similarity of the speech sounds. For example, when the child hears the sound, e.g. [pa.j.law], he/she is asked whether the sound sounded alike at the beginnings to the standard sounds [pu.ma] or [tow.p^hej].

The results of Repeated measures have shown that the differences among the three types of correspondences (C___, CV(C).___ and CV(C).C_) did not reach the significant level ($p < .05$). The results in the study of Walley et al. (1986) have shown that kindergarteners have shown their reliance when the shared unit is based on the maximal similarity. However, the results in this nonword classification task do not reveal any significance on the three conditions (initial segment similarity, whole syllable similarity and maximal similarity).

Concerning the lack of any special status of the syllables for young children in the phonological tasks, Walley et al. (1986) has pointed out that it may be due to the

differences in the level and kind of processing involved in the individual experiment.

Walley et al. (1986) mention that in their sound classification task, the children are not asked to present the explicit calculation of the stimuli, e.g. like how the speech sounds are classified together. The results from the sound classification task in the study of Walley et al. (1986) have suggested that the syllable may not play a role for the kindergarteners. In the experiments such as phonemes/syllable counting (Liberman et al. 1974), or phoneme/syllable deletion (Bruce 1964), the children need to present the active calculation of the stimuli, e.g. children need to tap out the numbers in the words spoken to them like three taps for the word “dog”. The results from the syllable counting task in the study of Liberman et al. (1974) and from the syllable deletion task in the study of Bruce (1964) have suggested the importance of the syllables for the young children. Therefore, the level and the kind of processing entailed in the nonword classification task is considered to be one factor for the insignificance of the syllables in judging the similarity of the speech sounds.

In addition, another factor needs to be considered is that the extent of difficulty entailed in the experiments. Treiman & Zukowski (1996) state that children’s performance on the phonological awareness may be different with the cognitive demands of the task. If one task requires more steps to completion and hence increases the burden on memory, it is considered to be a harder task than a task which

require fewer steps for completion (Yopp 1988). Looking at the steps in the sound classification task in the present study, first, children need to remember the two standard sounds and then, classify the novel sound according to the two standard sounds. Therefore, during the phase of classification, children have to deal with the two standard sounds and one novel sound at one time. Comparing with the word-pair judgment tasks which are presented in Chapter 4 in this study, the burden on memory may be less than the one in the nonword classification task. In the word-pair judgment tasks, children listen to a pair of sounds and decide whether they sounded alike. During the phase of judgment, children have to deal with the two sounds. If we look at the numbers of the sounds involved for the processing at each trial in the nonword classification task and in the word-pair judgment tasks, the burden on the memory in the nonword classification task may be heavier than the word-pair judgments. Therefore, the extent of difficulty caused by the burden on the memory may have influenced children's performance in the task. As to the assumption on the extent of the difficulty in the sound classification mentioned above, I would like to improve the experiment by decreasing the burden on the memory. For example, after the child listens to the novel sound, the experimenter can give the review to the two standard sounds (the names of the puppets) by saying "Does it sound alike to [pu.ma] or [tow.p^hej] (the two standard sounds)? This way, it may

help to reduce the burden on recalling the standard sounds. Children can pay more attention to compare the three sounds. Therefore, whether the children's performance can be improved by reducing the effort on recalling the standard sounds in the nonword classification task has to be further investigated in the future study.

5.2 Discussion on the word-pair judgment task 1 and 2

In the word-pair judgment task 1, I adopt the design in the study of Tremain and Zukowski (1996) to investigate the role of syllables and phonemes played in the perceptual similarity of sounds. Similar to the nonword classification task, the word-pair judgment task 1, this experiment requires children's ability of phonemic and syllabic analysis to detect the similarity of the speech sounds. In the word-pair judgment task 1, the subjects are asked to decide whether the two sounds sounded alike or not. For example, the subjects have to judge whether the word-pair, e.g. [maw.ku]- [mej.la], has shared the similarity at the beginnings of the words.

In the word-pair judgment task 2, similar to the word-pair judgment task 1, children are asked to judge whether the word-pair is sounded alike. The difference in the word-pair judgment task 2 is that children have to judge whether the word-pair is sounded alike at the ends of the words. For example, children need to judge whether the word-pair, e.g. [çi.maj]-[ku.laj], has shared any correspondence at the ends of the words.

5.2.1 Word-pair judgment task 1

Results in the word-pair judgment task 1 have shown that children performed badly on the type of the initial phoneme correspondences. They did significantly better on the types of syllable correspondences (Type B: CVC.____) and maximal correspondences (Type C: CVC.C__) compared with the performances on the types of initial segment correspondences (Type A: C__.____). However, there is no significant difference between the type of syllable correspondences (Type B) and maximal correspondences (Type C). That is, children perform equally well or the same on both types. The effect of size is observed in the comparisons, Type A vs. Type B, and Type A vs. Type C. However, the sizable advantage is not observed in the comparison between Type B and Type C.

With regard to the effect of unit size in children's phonological performance, Walley et al. (1986) has suggested that young children (kindergarteners) tend to compare the speech sounds through larger units. Besides, results in the study of Brady et al. (1994) also indicate that there is a significant correlation between the numbers of the shared units and the score in children's early phonological performance. In the studies of young children's representation of speech sounds, it has been found that there appears a trend from holistic units to segments (Walley 1993). Children begin their representation of speech sounds through larger units and

gradually the refine the representation into smaller units (Walley 1993). The results from the studies (Treiman & Baron 1981, Treiman & Breaux 1982) indicate that children tend to focus on the overall shape of speech sounds to the judgment or classification of the speech sounds. Those findings may have directly or indirectly suggested the influence of the sizable advantages in child's phonological processing. In the perspective of size, objects with larger size are more obvious to the perceptions. Hence, it is comprehensible why the larger units are more acceptable for young children. In this sense, children can easily to detect the similarity when two speech sounds share more phonemes. However, the reliance on the larger units is not a sufficient way for the language processing. The abilities to detect the smaller units will be required in the subsequent development. Like the phonological representation, children have to refine their representation of speech sounds into smaller units in order to deal with the increasing amount of vocabulary (Walley 1993).

As to the lack of significant differences between Type B, and Type C in the word-pair judgment task 1, the sensitivity to the similarity between speech sounds may not only due to the effect of unit size. The results suggest that the effect of unit size may be masked by the salience of syllables. In the sense of the salience of syllables, relying on the syllable correspondence from the shared units is enough for children to compare the two speech sounds. When more segments are involved in

judging the similarity, it does not help much. Therefore, the awareness to the syllabic correspondences may decrease the importance in the type of maximal correspondences in detecting the similarity of two disyllabic nonwords. In this experiment, children are almost insensitive to the word-pair which shares one phoneme correspondence. The similarity between the word-pair in the type of the initial phoneme correspondence is hardly to perceive. And in the type of syllable correspondence and the types of the maximal correspondence, it seems that the syllabic correspondence has served as an optimal domain for children to judge the similarity between two disyllabic spoken nonwords.

The importance of the syllable is not only observed in children's phonological performances. In the theoretical views on the syllable structures, the syllables also possess a special status in the phonological theory (e.g. Selkirk 1982, Blevins 1995). In the framework of syllable structure, the syllable is a construct with hierarchical constituents. The syllable node is placed in the head of the constituents and phonemes are served as its sub-constituents. Compared with its sub-constituents (phonemes), the syllable is more often treated as the target component, e.g. serving as bearing unit for the tone and stress. However, the phonemes in the syllables receive more constraints from the phonological rules, e.g. the substitution of the phonemes in a syllable is often strictly controlled by the phonotactic constraints. For example, the

consonant [f] in Mandarin can go with the vowels like [u], [a] or [an] but it can't go with *[i].

The results from the word-pair judgment task 1 also support the theoretical views on the syllable and its sub-constituents. Since the syllable is often served as the target unit and the phonemes in the syllable are imposed more constraints in applying the phonological rules, the syllable condition is more accessible than the phoneme condition. Therefore, the observed differences between the phoneme correspondences and the syllable correspondences may reflect the theoretical views on the syllables.

To account for the salience of the syllable in the phonological tasks, Treiman & Zukowski (1996) also propose that the linguistic status of the shared unit may play a role. With the references to the framework of syllable structure (Selkirk 1982, Blevins 1995), the syllable is placed on the top of the hierarchical construct and phonemes are belonging to lower level of the construct. Hence, the syllables are more accessible than phonemes in the lower levels (Treimana & Zukowski 1996).

The differences between the syllable and phonemes are not only due to the factor of size but also to the hierarchical relationship that they have in the syllable construct.

The present results are inclined to viewing the differences between the syllables and segments not only in the aspect of size but also in the aspect of syllable construct

which containing a hierarchical relationship between the syllable and its itrasyllabic segments.

5.2.2 The word-pair judgment task 2

The overall results in the word-pair judgment task 2 are consistent to the results in the word-pair judgment task 1. The results from the word-pair judgment 2 have shown that children are significantly better when the shared unit is based on the syllable correspondences (Type E: ____CVC) and the maximal correspondences (Type F: _VC.CVC) compared with type of rime correspondence (Type D: ____VC).

The rime correspondence (Type D) is not significantly better than the final syllable correspondence (Type E) and maximal correspondence (Type F) in the word-pair judgment task 2. The young children do not demonstrate their familiarity with the rime. With regard to the studies of the rime, Bryant et al. (1990) finds that the children's sensitivity to rime leads to the awareness of phonemes and also contributes to the reading. Treiman and Zukowski (1996) find that the superiority of the syllables is largely masked by children's awareness of the rime. However, the present results do not reflect the sensitivity to the rime in young children. Since the young children do not show the sensitivity to the rime correspondence in the word-pair judgment task 2, their sensitivity to the syllable correspondences is not masked by the rime correspondences.

In the hierarchical relationship that the syllable and its sub-constituents have, the access to the syllables is more reachable than its sub-constituents. The constraints existing in the operation on the sub-constituents in a syllable may affect the detection of the rime correspondences.

As to the comparison between the type of syllable correspondences (Type E) and maximal correspondences (Type F), children perform equally well on both types. That is, the advantages of size are not revealed in the comparison between the maximal correspondences (Type F) and final syllable correspondence (Type E). The results are similar to the findings of the word-pair judgment task 1 by indicating that the awareness to the syllable correspondences may decrease the effect of size in the maximal correspondence. Children may treat the maximal correspondence (Type F) task as the syllable correspondence (Type E) task.

In general, the present results suggest the syllable should be viewed as hierarchical construct (e.g. Selkirk 1982, Blevins 1995). The reliance on the syllable correspondences and maximal correspondences may be due to the easy access to the syllable construct. Besides, the poor detection to the rime correspondences may be due to the difficult access to the lower level of the syllable construct and the constraints imposed on the sub-constituents. With regard to the sensitivity to rimes (Type D), children were still poor in judging the rime correspondence in comparison

with the final syllable correspondence (Type E). They did not show the familiarity of rimes. It is contrast to the English speaking children in the study of Tremain and Zukowski (1996), in which the increased attention to the final rime correspondence is mentioned in the comparison with the final syllable correspondence.

5.3 Discussion on multiple comparisons

This section aims to discuss whether the position of the shared units has played a role in judging similarity of the speech sounds by comparing the word-pair judgment task 1 with the word-pair judgment task 2.

In the comparison between the overall performances in the word-pair judgment task 1 and 2, the results of Repeated measures shows that the differences between task 1 and task 2 are not significant. Children perform equally the same in the word-pair judgment task 1 and in the word-pair judgment task 2. Besides, the differences between the initial phoneme correspondences (Type A) vs. the rime correspondences (Type D), the syllable correspondences (Type B) vs. the syllable correspondences (Type E), and the maximal correspondences (Type C) and the maximal correspondences (Type F) are not significant. Children do not show the preferences whether the shared unit is based on the word-initial correspondences or on the word-final correspondences.

The results from the multiple comparisons do not suggest that the position of the shared unit may influence children's judgment in the experiment. However, it is contrast to the findings in Walley et al.'s (1986) study which states that the attention to the beginnings of the sounds emerges prior to the ends of the sounds. In the word-pair judgment task 1 and 2, the special attention to the beginnings of the sound is

not found in the Mandarin speaking children.

In the study of the spoken word recognition, the word-initial information has played a role in adults and similar results are found in children (Cole 1981). More attention is dedicated to the initial segment of the words than to the other parts of the words in the spoken word recognition. However, in judging the similarity of the speech sounds, the position of the shared unit does not lead to variant attention in both tasks.

5.4 Conclusion

The present study aims to investigate the roles of syllables and phonemes in child's phonology by detecting the sensitivity to similarity between the speech sounds. Based on the findings in the word-pair judgment task 1 and 2, the syllable has served as an important unit in children's phonological processing.

The effect of the size of a unit is not found the comparison between the maximal correspondences and the syllable correspondences. Children perform equally well on the types of the correspondences and on the types of the syllable correspondences. It indicates that the effect of size is not at all crucial to detect the similarity between the speech sounds. Children's awareness to the syllable correspondences would mask the effect of the size of a unit in types of the maximal correspondences.

Since the performances on the maximal correspondences are not significantly better than the syllable correspondences, the advantages for syllables over phonemes may not only due to the sizable superiority. In general, the results in the present study have suggested the effect of the hierarchical relationship in the syllable constructs to account for the difference between the syllables and segments. In the theoretical views of syllables, the syllable is often treated as an optimal domain for the application of the phonological rules. The sub-constituents (phonemes) in the syllable are belonging to the lower level of the syllable constructs and usually

imposed with strict constraints. Hence, they are more difficult to access or calculate.

Evidence from the word-pair judgment task 1 and 2 has suggested the hierarchical relationship in the syllable and phonemes plays a more crucial role than the difference in size between the syllable and phonemes.

As to the position of the shared unit, the present results do not reflect the effect from the position of the shared unit.

In summary, the present results support the effect of the framework of the syllable constructs to view the salience of the syllable in children's sensitivity to the similarity between the speech sounds. In children's sensitivity to the similarity of the speech sounds, the syllable is not a flat structures composing of segments. From children's performance, the concept of hierarchical construct in a syllable structure may serves as a better explanation to account for children's phonological processing in detecting the similarity of speech sounds.