

同時習得三國幼兒音韻之跨語音現象： 閩南語、西班牙語及中文為母語為例

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摘要

音韻學是語言學理論中研究其聲音系統的次領域，除了可以用來分析語言間的相似和差異性外，也可以用來了解兒童語言的聲音系統發展。此研究分析重點在跨語言的語言學習影響，特別強調學習者在音韻學及詞彙領域中的互動。研究發現：小孩同時習得三種語言情形下是有一些音的干擾。研究結果更指出：多語學習小孩雖在音韻上的發展與單語學習小孩同步，然而在資料顯示上卻有其強勢語言、弱勢語言、語言的輸入、互相干擾音的及跨語言的現象等之不同情形產生。學習單一語言與多語的小孩其相似與對照的不同，在此跨語言的研究中頗具廣泛的意義。

關鍵詞: 音韻學、跨語言影響、語言轉換

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1. Introduction

Many people who have contact with bilingual or multilingual children have noticed that their typical characteristic in acquiring languages is mixing. An increase of the investigation on bilingual or multilingual children has been more interesting to scholars recently. In the past, the main research question was concerned whether they have undifferentiated or differentiated linguistic systems. However, some researchers have started thinking about the issue of one vs. two systems, and whether it is worthy to continue with this question. De Houwer asks whether it's appropriate to raise this point in relation to developing bilinguals under the age of two (De Houwer (1995). The obvious cross-linguistic structures in the children's output may have become marginalized (Döpke, 2000). Furthermore, Deuchar and Quay (2000:111) argue "that the polarization of the issue into a question of one versus two systems may lead to oversimplification". Going further, it may be more appropriate to approach the study of bilingual first language acquisition from another point of view. Many researchers have tried to extend their investigation accounting for cross- language influences; and cross-linguistic structures can be considered as intricate aspects of bilinguals during the development of language acquisition (Döpke, 2000). It has been deemed that the phenomenon of "transfer" or "cross-linguistic influence" is the term commonly used for the influence of one language system on the other, and it can occur on all linguistic levels (Jeßner, U., 1997). In other words, the fact is that mixing of two or more languages occurs during the children's language development, and it has been widely accepted by many linguists. Mixing of grammatical morphemes has been noted by Bergman (1976) in her Spanish/English bilingual daughter; she used the English possessive morpheme "'s" in Spanish contexts. Oksaar (1971) has been reported that her Estonian/Swedish bilingual child used loan blends in phonemic segments from the two languages, like the word "cat", the child uttered "kats", which is the combination of the Swedish word "katt" and the Estonian word "kass".

Previous research has been investigated with bilingual children, little work, however, has focused on the language acquisition of trilingual children who are acquiring three languages simultaneously. Some cases have been reported by Hoffman: Harding and Riley (1986) have reported the child whose native languages were German, French and Portuguese from the early age, and the subject's best dominant language was Portuguese during their stay in Brazil, but after they moved back to France, the subject's Portuguese was decreasing while his French was improving. Other case study is Arnberg (1987), described a family with three languages: Finnish spoken by the mother, Kurdish spoken by the father and Swedish

was the language of the social environment; and the children's knowledge of Kurdish decreased when their father moved away. Obviously, both cases represent examples of transient trilingualism (Hoffman, 2001). Another study reported by Hoffman (1985), it was concerned with many aspects of language development and use in trilingual children: Spanish, German and English, the children had acquired positively these three languages and had developed with sufficient competence. Hoffman (1985, 1991, 1992) has also shown different combinations of the three languages, the child had used English with German lexical and phonetic mixes and ended the conversation about the game in Spanish. The result showed that the child was aware of having two languages at least, and she might have been unaware of mixing from German. Similarly, Oksaar (1977) in studying the child acquiring the Estonian-Swedish from birth, and later acquired German at the age of three, found evidence of transfer on the lexical level in the subject's first two languages. The above cases have alluded that the trilingual children may influence the two languages rather than the three languages.

In fact, most research on bilingual and trilingual children's acquisition of language has mostly focused on children acquiring languages from the same language family. This study differs from other studies; it deals with three languages that have been rarely studied in trilingual phonological acquisition, the combination of these languages is scarce, that is Taiwanese, Spanish and Mandarin Chinese. To my knowledge, these languages have never been studied together in language acquisitional research. In this paper, it's going to address the development of the trilingual child comparing with monolingual children in the mentioned languages; and the question of how the trilingual child has influence in these three languages. Likely, the cross-linguistic influence phenomenon has been also focused on this child at the early age (1;3-2;0). Quay has pointed out that language differentiation is not evident at the early age in infant language development (Quay, 1995). Longitudinally, this paper provides some data from a multilingual child's early words, and shows interesting cross-linguistic differences in early sound features. It is generally agreed that interference occurs only when bilinguals use languages separately in different context or with different people (Romaine, 1995; Yavas, 1998). Another suggestion proposed by Döpke (1998) and Müller (1998) saying that cross-linguistic transfer may occur when there is interlanguage structural ambiguity in the input. As the child is exposed to three languages at the same time, the hypotheses suggested that a trilingual acquisition in phonology may have an autonomy or interdependent development (Johnson & Lancsre, 1998). To expand the term "interdependence", it can be identified three possible ways: transfer, acceleration and delay. Transfer refers to the influence of the dominant language in the other language; acceleration may occur when a certain sound is acquired earlier in one language, and might be also acquired

earlier in the other; delay, as the word meaning indicates slower development in one or both languages comparing to monolingual children. (Holm & Dodd, 1998; Keshavarz & Ingram, 2002). It has been widely discussed whether bilingual acquisition would be acquired more slowly than monolingual acquisition. . Eventually, the investigation of bilingual or multilingual children in phonological acquisition is more challenging than those of monolinguals; it is assumed that bilinguals or multilinguals may not have the same development as those of their monolingual peers due to the interaction or interference between the different phonological systems of the languages they acquire (Zhu, H. and Dodd, B., 2006).

In the present study, we will make a comparison with monolingual children of these three languages, the evidence of interference among the three phonological systems during the child's language acquisition, and finally, the language of dominance or stronger language will be illustrated.

2. A comparison of Taiwanese, Mandarin and Spanish phonologies

Despite the fact that both Taiwanese and Mandarin Chinese belong to the same family of Chinese languages, they still have different phonologies and tones. In this study, we are going to see the phonological patterns rather than tonal acquisition. Regarding to Spanish, it focuses on Paraguayan Spanish which is characterized in the use of Latin American Spanish.

2.1 Taiwanese: it's commonly called / t^hai yu/ 台語 , the language of Taiwan, or Min nan dialect 閩南語 which came from FuKien province, and it's widely spoken by 80% approximately of population in Taiwan. In fact, most Taiwanese people are grown up with both Mandarin Chinese and Taiwanese languages.

Phonetically, Taiwanese is a tonal language; it consists of an initial consonant, a vowel, a final consonant, and a tone; all of the consonants and vowels may be nasals. The consonants /m/ and /ng/ can function as a syllabic nucleus and can also be considered as vowels, for example, /t^hng/=soup, /m/=no. A Taiwanese syllable requires a vowel (or diphthong or triphthong) in the middle; all the consonants may appear in the initial position, but only /p,t,k,m,n, and ng/ may appear in the final position of the syllable (Wang, Y. and Huang,K., 1993).

2.2 Mandarin: Mandarin is officially called / guo yu/ 國語 in Taiwan which means national language, whereas it is called Puthonghua 普通話 in Mainland China, which means common language. The obvious different sounds between Taiwan Mandarin and Puthonghua are the fricative and affricate sounds. The phonological contrast Taiwanese people tend to delete the rhotacisation or retroflex sounds when speaking Mandarin. In syllable structures, similar to Taiwanese syllables, the vowel in the

The brief sketch of phonologies of these three languages is shown below in table 1:

Table 1 Phonological system of Spanish, Mandarin and Taiwanese

Stress:

Spanish uses “stress” to distinguish different meanings, whereas Mandarin and Taiwanese use “tone” to distinguish different meanings.

Syllable structures:

Taiwanese can be mono-syllabism (C) V (C)

Mandarin is also mono-syllabism while Spanish can have many syllables. (C) V (C)

Spanish has many cluster sounds, but Taiwanese and Mandarin don't. (C) (C) V (C)

Consonants: stops nasals affricates fricatives approximants

lateral appro.

Taiwanese: p,p^h,b,t,t^h k,k^h,g, m,n,ŋ ts,ts^h s,dz,h l

Mandarin: p,p^h,t,t^h k,k^h m,n,ŋ ts,ts^h, tʃ, ts^h tʃ, tʃ^h f, s, ʃ, ɸ, x ʌ l

Spanish: p,b,t,d,k,g m,n,ɲ tʃ, ɟ f,s,x,h r, r, ʎ l

Both Mandarin and Taiwanese have aspirated consonants while Spanish doesn't have aspiration.

Vowels: front central back

Taiwanese: i, e a u, o, ɔ, ə

Mandarin: i, y ə A, u, ɤ, o

Spanish: i, e a u, o

Spanish has the simplest while Mandarin has the more complex vowels.

except the velar nasal /ŋ/; only two consonants /n/ and /ŋ/ can be in the final position (Zhu, 2002). In both Mandarin and Taiwanese, aspiration is a distinctive feature; all the aspirated consonants are voiceless. We can not find, however, the aspirated sounds in Spanish.

2.3 Spanish: Spanish is the most widely spoken Romance language. It is a syllable-timed language, which means that all stressed and unstressed syllables have almost the same duration. It is also said a spelt language, which means that there's a regular correspondence between letters and sounds. Phonetically, the consonants can occur in syllable final position, except the consonant /t/. As for codas, the most common final consonants are /d/, /x/, /tʃ/, /r/, /s/, /l/, /m/, /n/. In syllable structures, Spanish is common in clusters whereas Mandarin and Taiwanese do not have clusters. As for onset clusters, stop or /f/ may be the first word followed by a liquid /l/ or /r/, such as flor= flower, globo=globe, pronto=quick. Clusters may also occur within a word, but not in the word final, for example, abstracto=abstract, construcción= construction. (Hualde,J. 2005).

As it has been mentioned the difference between Mandarin in Taiwan and

Mainland China; there's also a slight distinction between Spanish in Spain and in Paraguay. The obvious difference that we found is the deletion of /r/ in the final position, like *comer* is pronounced as [komé], sometimes they delete even in the middle, such as *dormir* =[domí]. Another distinction can be made the contrast between //j/ like *calló* and *cayó* are differently pronounced. Paraguayan Spanish maintains the phonemic contrast between //and /j/, the phoneme /j/ is normally an affricate sound like [tʃ]. In Paraguay, a syllable and the word final /s/ is weak pronounced, possible due to the influence of the indigenous language Guaraní. In fact, Paraguay is the only country South America that preserves its own dialect as a symbol of national identity. Another obvious distinction is the use of /θ/ corresponding to *z* and *ce*, *ci* in the spelling (Hualde, J.2005). The /θ/ sound is widely used in Spain Spanish but it does not completely exist in Paraguayan Spanish.

3. Method

3.1 The subject and his background

The subject's name is Diego (referred to here as D). He was born in Paraguay. His father is a Paraguayan whose native languages are Spanish and Guaraní, and his mother is a Chinese from Taiwan, who can speak the three languages fluently. In addition, his maternal grandmother is also a native speaker of Mandarin and Taiwanese, but her dominant language is Taiwanese, with little speaking ability of Spanish. A trilingual policy was initiated at the time of Diego's birth so that he could acquire Mandarin, Spanish and Taiwanese simultaneously. Most of the time, his mother spoke Mandarin with little Spanish to him, while his father would only speak to him in Spanish, and the grandmother spoke to him in Mandarin mixing with little Taiwanese at the same time. Moreover, the parents spoke to each other only in Spanish, while the grandmother and mother's conversation is always in Taiwanese. Though the child has been raised in one-parent one -language strategy, he had the input of three languages most of the time. Therefore, it is assumed that Diego aged from 15 to 24 months had a balanced input in three languages. In addition, the family had more contact with Taiwanese/Mandarin speaking friends. His diversity degrees of exposure to the three languages are reflected in his vocabulary acquisition.

3.2 Data collection

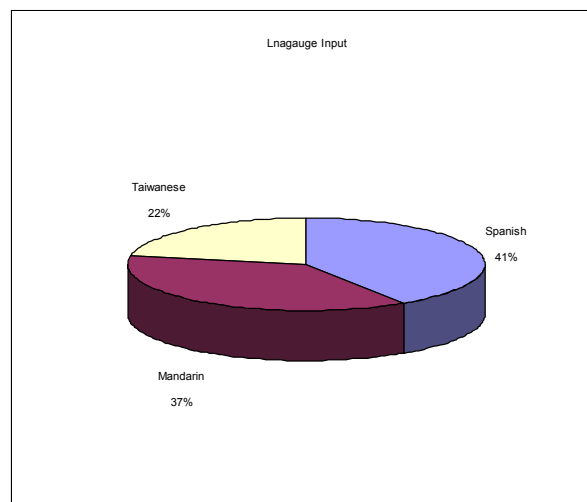
The data were collected from 15 months of age until Diego was 24 months old. Data consisted of three sources: a) observations, b) audio recordings and c) occasional video recordings. The researcher made several visits to the subject and recorded his sporadic conversations during her stay in Paraguay. The family also cooperated to

make recordings in different language contexts. Some diary records have been made by the grandmother, and his father made the video recordings occasionally in his free time. The subject “D” was chosen because it was really hard to find a subject whose family use three languages, in addition, the family were very graceful to help with the data. Therefore, the researcher provided some gifts and toys when visiting the subject.

4. Results and Discussion

4.1 Language Input

Research studying bilinguals’ phonological acquisition suggests that language inputs and the extent of use of the languages do influence phonological development (Bialystok, 2001). To analyze whether the child, D, is aware of the existence of three languages, we have calculated the quantity of his input and his exposure to these languages as shown in the pie chart 1 and 2. As Goodz (1988) claims that the language input influences a child in the process of language development, the nature of the input plays an important role in bilingual/ multilingual acquisition (De Houwer, 1990; Deuchar and Clark, 1988; Lanza, 1990). Obviously, the parents are the most influential people on children’s languages acquisition, since children spend most of the time with their parents. Hence, the input from parents has been shown to have a major influence on a child’s acquisition in general. However, children who were born in families with other siblings may have same kind of impact on their own language development. In this case, D has a major part of input not only from his parents but also from his grandmother. As shown in the pie charts below:

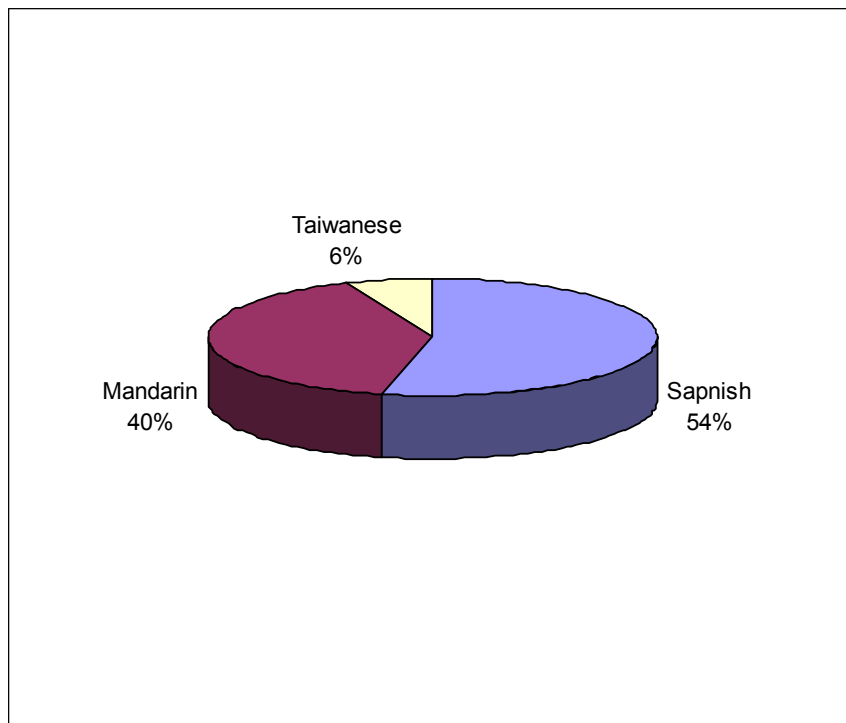


Pie chart 1 : Language Input

From the pie chart, the result shows there’s only 3.7 %of difference between

Spanish and Mandarin input, the tiny difference is due to the TV program, which became a great source of input during his routine; there's 22.22% regarding to Taiwanese input, though there's no big difference comparing with Mandarin and Spanish, D rarely uttered Taiwanese in his context as shown the table below. Most of the time, he was adapted to listen to the conversation between his mother and grandmother speaking Taiwanese, and most of the visitors' language as well as phone calls were also in Taiwanese.

The table two explains the language interaction between Diego and his family members. In other words, it shows the quantity of Diego's language exposure in Mandarin, Spanish and Taiwanese accordingly.



Pie chart 2: Language Interaction & Exposure

As shown in the chart, Spanish was considered as his dominant language with 54% of exposure, followed by Mandarin. In contrast, his exposure to Taiwanese was only 6%. The main reason for this is that he has been taught to utter Spanish and Mandarin words mostly, and he was not really forced to produce Taiwanese words though he could understand the Taiwanese context. Sometimes he spoke Taiwanese just for repetition from adults, since most children at this age tend to imitate the interlocutors' words, though the imitated responses would be decreased with age (Zhu, 2002). From the observations or recordings, he seldom used Mandarin or Taiwanese with his father unless he tried to fill the lexical gap; as he was grown up with one

person/ one language situation, he could naturally switch from one language to the other according to the interlocutor. The strict separation of the two languages allows the child to process both languages separately (Koehn & Müller, 1990; Döpke, 1992). The result so far demonstrated that Diego at least could differentiate the two languages between Mandarin and Spanish; as most research shows that bilingual children at the age of two know that they are acquiring two languages, but they still have mixing because they need to fill gaps by syntactic and lexical borrowing (Peterse, 1988; Lanza, 1992, 1997; Genesee et al., 1995 Gawlitzek-Maiwald and Tracy, 1996; Döpke, 1998; ven der Linden, 2000). In Diego's case, he might know that he was acquiring three languages simultaneously, and he preferred to speak Spanish rather than the other two languages. Since Spanish is the language of the environment, it can be inferred that Spanish is also Diego's dominant language. Romaine (2001) suggests that bilingual or multilingual children are dominant in one of the languages they encounter, and their dominant language influences their other nondominant ones. From the quantitative perspective, the dominant language develops faster than nondominant ones; and qualitatively, the phonological interference may occur (Law, N. & So, K., 2006).

4.2 Language of dominance

There is no clear definition of language dominance in bilingual acquisition (Yang, H. & Zhu, H., 2010). Here we may refer to a language that the child mostly preferred to utter. There were several occasions that Diego chose Spanish words to respond Mandarin or Taiwanese contexts when he knew that interlocutors were bilinguals, as shown the examples below:

1) (conversation with his Aunt, at 1;4:26)

A: /ni k^han, hau tuo hua/ 你看, 好多花 (in Mandarin) = Look, there are many flowers

D: coche! (in Spanish) = cars (he only looked at cars rather than flowers)

2) (conversation with his mother at 1;4:28)

M: /.shia le, ㄊㄨˊ ㄕㄨˊ ㄕㄨˊ ㄇㄨˊ mo/ 小磊, 這是甚麼? (in Mandarin) = Diego, What's that?

D: mami, luna (in Spanish) = mami, moon (that is moon, mum)

3) (conversation with his auntie, at 1;5:1)

A: ti tsia 在這裡 (in Taiwanese) = it's here

D: aquí (in Spanish) = here

Similar to previous research, It has been reported by Khattab, G. in her bilingual study, the children tended to respond English in Arabic sessions, even their mothers were asking them to answer in Arabic, they naturally code-switched into English. Such behavior is expected considering the fact that those bilinguals are English-dominant. (by Khattab, G. ;2002: 342).

The next issue to be discussed is whether he had cross-linguistic influence in

these three languages. Starting from the phonological development, children in different bilingual environments may show different patterns of phonological acquisition (Keshavarz, M.& Ungram, D., 2002). As Keshavarz & Ingram (2002) investigated the early phonological development of a Farsi-English bilingual child, found that a child had separate phonological systems with some influence of each upon the other and vice-versa. The analysis of the phonemic and vowel inventories demonstrates the emergence and development of sounds in each language.

Table 2 : Diego’s phonemic inventories in three languages in the longitudinal study (in year, month, day)

Age	Mandarin	Spanish	Taiwanese
1;3:26	m, n, p, t, k, -n	t, n, p, m	m
1;3:27		tʃ, d	k
1;4:3	ts		
1;4:9			
1;4:15	tʃ	k, b	
1;4:17		r, ɲ	
1;4:24		ʌ	
1;4:25		ɟ	n
1;5		l	ts
1;5:5		x, g	
1;5:8			t, p
1;5:12			s
1;5:17			b
1;5:20	x		
1;5:28	s		
1;6:8			-n
1;8:4		s	
1;8:9	l		
1;10:12			l
1;10:26		-l	

Missing phonemes

(Mandarin consonants): /f, p^h, t^h, k^h, ts^h, tʃ^h, tʃ, ʃ, ɲ, ʌ, ɕ/

(Spanish consonants): /f, r, h/

Taiwanese Consonants: /h, t^h, k^h, p^h, ts^h, ɲ, g/

Note: /n/ =syllable initial consonant.

/-n/ /-l/= syllable final consonant.

Table 3 : Age of emergence of vowels in three languages in the longitudinal study (in year, month, day)

Age	Mandarin Vowels	Spanish Vowels	Taiwanese Vowels
1;3:26	A, u, i, o	a, e, i, o, u	a
1;3:27	iou, ei		
1;4:2	iɛ		
1;4:3	ao	ua, ao	ue
1;4:9			l, ɔ, o
1;4:11	ɛ		
1;4:13		ai	
1;4:15		io, ie	e
1;4:22	uei		
1;4:26	ua		
1;4:28	ia		
1;4:29		ue	ia
1;5:5		oi	
1;5:7		ui	
1;5:8	iao		iao
1;5:10			u, ai, io, iu
1;5:11		ia	
1;6:8			ea
1;8:4		oa	
1;8:6	ae		
1;8:7			ua
1;10:12		eo	
1;10:23	uae		
1;10:30			au
Missing Mandarin simple vowels: /ɣ, ʁ, ə, /			
diphthongs: / ou, uo, yɛ /			
Missing Spanish diphthongs: /ae, eu, au, ei/			
triphthongs: /uei, iai/			
Missing Taiwanese simple vowels: / ə /			
diphthongs: / ui /			
triphthongs: /iau, uai/			
Mean age of emergence of simple vowels :			
Mandarin: 1;4:11			
Spanish: 1;3:26			
Taiwanese: 1;4:15			
Mean age of emergence of diphthongs and triphthongs:			
Mandarin: 1;6:22			
Spanish: 1;6:22			
Taiwanese: 1;7:22			

4.3 The acquisition of consonants

The tables 2 shows the age of emergence and stabilization of consonants in his three languages. The phonetic inventories should be considered when the child produced once or imitated the target words no matter he pronounced correctly or not. Since the data is taken from the spontaneous conversation, most children at the age of 1;0 -2;0 tend to imitate the adults' utterances. Therefore, many imitated words have been included in the data. However, the phonemic inventories in tables 2, and 3 show the results of the stabilized sounds; it means when the child produced the sound correctly at least two or three times (Zhu, 2002).

For the detailed phonological analysis, it should be noted the phonetic and phonemic inventories of D's three languages. These inventories are based on transcriptions of audio recorded data collected by the researcher and the subject's family in different contexts.

In terms of consonants, as tables shown above, D still had 11 missing consonants in Mandarin /f, p^h, t^h, k^h, ts^h, tʂ^h, tʃ, tʃ^h, ʃ, ɲ, ɟ, ʑ / while there are 22 consonants in Mandarin. In contrast, D only had 3 missing consonants in Spanish /f, r, h/ in 19 consonants. In terms of Taiwanese, he had seven missing phonemes /h, ts^h·k^h·p^h, ts^h, ɲ, g/ while there are 16 consonants. The common missing phonemes found are aspirated sounds whereas Spanish doesn't have the aspirated sounds. The other obvious missing sounds are retroflex fricatives and affricates, which are rarely found in Taiwan Mandarin. Most Taiwanese people tend to eliminate most of these sounds when they speak Mandarin. Thus, these retroflex sounds may find difficult for D to acquire since his grandmother didn't produce retroflex sounds appropriately. Accordingly, there are no retroflex sounds in Paraguayan Spanish.

4.4 The acquisition of vowels

In terms of vowels, they are normally easier than consonants to be acquired. Simply, vowels have higher "phonological saliency" than consonants (Zhu, 2002). Evidently, D's Spanish simple vowels were stabilised a little earlier than the other two languages, the mean age of emergence was 1;3 whereas the mean age of simple vowels in Mandarin and Taiwanese was 1;4 approximately; in fact, he still couldn't produce some simple vowels in Mandarin., such as: /y, ɤ, ə, / , and /ə/ in Taiwanese. Since the data was taken at the early stage, thus, we didn't find all these sounds correctly pronounced at this period. The above table 3 illustrates the age of emergence of vowels in his three languages was extracted from his spontaneous speech, and the average age of emergence of simple vowels and diphthongs respectively.

4.5 Examples of phonological interference

Many Spanish words have final /s/. Garland (2001) reported that bilingual

children develop faster than monolingual children in the use of word-final phoneme in Spanish. The emergence of the final /s/ is around the age of two or before; and the mean age to master the sound is 2;6 in bilinguals while monolinguals are found around 2;10. Unlikely, in our case, it seems rare that this trilingual child pronounced /s/ in the final consonant; he tended to delete most of the words with the final /s/. Word and syllable –final /s/ in many Latin American countries tend to be weakened or deleted (Hualde, J., 2005).

Examples shown below:

<u>word</u>	<u>target</u>	<u>gloss</u>	<u>age</u>
* racia / racia/	gracias	thanks	1;3:26
* ruta / ruta/	fruta	fruit	1;4:3
* río / río/	frío	cold	1;7:2
* rande / rande/	grande	big	1;8:7

In terms of Taiwanese, Xu (1988) in her research showed the child could produce a high percentage of correct production in simple vowels between the age of 1;6-2;0. She demonstrated that the vowel /a/ and /ə/ were the first vowels acquired by her subject. Like Spanish vowels, Taiwanese vowels are also simple which can be easily acquired by monolingual Taiwanese-speaking children at the early age. They can even master the diphthongs, triphthongs and two syllabic sounds at the age of 3;0. On the whole, in Taiwanese, the initial consonants were acquired earlier than ending consonants; the nasals and stops were first to be mastered, and the affricates were to be mastered last. Before the age of three, the children were able to produce the nasal endings before the stop counterparts. In D's acquisition of vowels, the mean age was 1;4; obviously, it's approximate age comparing to a monolingual Taiwanese speaking child studied by Xu (1988), the only difference of vowel acquisition was /ə/ , which couldn't be produced by D yet. Like monolingual children, D could be able to pronounce the nasal ending at 1;7. Several examples could be found in his little Taiwanese context.

<u>word</u>	<u>gloss</u>	<u>age</u>
pian 餅	biscuit	1;2:12
kian 走	go	1;5:20
kon 公	grandfather	1;6:8

Zhu (2002:45) pointed out young children were expected to de-aspirate and stop within a syllable; Assimilation and deletion at the initial and final consonants were also commonly found in infants around the age of two. Likely, the next issue to be discussed is to analyze how D's sound features interfere among each other.

4.5.1 Consonant interference

The substitution of sounds is commonly found in children, they may seek an

easier sound to replace the similar one. Undoubtedly, cross-linguistic research has also demonstrated that different languages show different substitutions (Keshavarz, M. and Ingarm,D. 2002).

(1) the substitution of aspirated sounds: as we know, there are no aspirated sounds in Spanish phonology, yet Mandarin and Taiwanese are distinctive because of their aspiration, as shown in the table one. One of the typical characteristics of early bilingual development is that children have one prefer language as dominance (De Houwer, 1995). Similar to them, it is obvious that D tended to have Spanish as his dominant language, as shown the table 2&3. Evidently, he used deaspiration to replace aspirated consonants, like the below examples:

<u>Mandarin</u>	<u>Target</u>		<u>Gloss</u>	<u>Age</u>
* /pa pa/	/ p ^h A p ^h A/	爸爸	afraid	1;4:3
* / pu tao/	/ p ^h u t ^h ao/	葡萄	grapes	1;5:10
* /ka ton/	/k ^h A thon/	卡通	cartoon	1;10:30
<u>Taiwanese</u>	<u>Target</u>		<u>Gloss</u>	<u>Age</u>
* /ka/	/ k ^h a/	腳	foot	1;4:28
* /ka-ta-tsia/	/ k ^h a-ta-t ^h ia/	腳踏車	bicycle	1;10:26

Interestingly, Jen (1979) in his study of the two boys in Mandarin phonology in Taiwan aged between 1;2-2;7, found that his subjects could pronounce the aspirated sounds around at the age of 1;8. Unlike these two monolingual children, in Diego's trilingual situation, his data showed the lack of aspiration at this period when he spoke Taiwanese and Mandarin. He tended to use voiceless counterparts to replace the voiceless aspirated stops. According to Li (1978), the contrast between aspirated and un-aspirated stops was learned at an early stage in child language. Although each child's phonological acquisition may vary; yet, from the data, this observation was not revealed in this case study. Possibly, due to his influence of Spanish, he may acquire aspirated sounds later than other monolingual children. As his exposure of Spanish was much greater than the other two languages; thus, it can be inferred that he tended to substitute the aspirated sounds with Spanish un-aspirated voiceless stops.

(2) the substitution of liquid sounds: different languages can be found different substitutions, as for Italian children, they substitute [l] for /r/, and [n] for /l/, (Leaoanard & Bortolini, 1991, cite in Keshavarz, M. and Ingarm,D. 2002). In Diego's data, he already acquired the liquid sounds / r/ and /l/, except the trill /r/. Notice that monolingual Spanish-speaking children can hardly produce the affricates, liquid /l/, flap/ r/ and trill /r/ around the age of two (Anderson & Smith, 1987; Mann *et al.*, 1992; Pandolfi & Herrera, 1990; Vivaldi, 1990, cited in Yavas, M. & Goldstein, B., 2006). However, regarding to the liquid alveolar sound /l/, D acquired easily at the age of 1;5:5 in Spanish, and at 1;8:19 in Mandarin, 1;10:12 in Taiwanese. However,

the data showed he mastered this sound only in Spanish, but used the flap / r/ to replace the alveolar /l/ in most of Taiwanese and Mandarin contexts. Though the liquid alveolar /l/ sound was not difficult for Diego to acquire, he did not pronounce this sound appropriately neither in Taiwanese nor in Mandarin. The main reason may be justified in the input he received from adults. Most Taiwanese people do not pronounce the /l/ correctly in both languages. Due to this reason, most Chinese immigrants in Paraguay always confuse the pronunciation among lateral approximant /l/ and the trill /r/, and the flap / r/ sounds when they speak Spanish. Hence, the result illustrated that Diego's phonological output for these sounds were highly influenced by the phonological form of the "adult models" (Ingram, 1981-2:26). Though there's a lateral consonant in Taiwanese phonology, it is also heard the use of flap / r/ in Taiwanese since the majority of people produce it naturally in conversations, and it is acceptable in the speech community. The child's language, especially, the bilingual's language systems consists of "sociophonetic variation" (Khattab,G.,2002: 337); that is, children don't have a correct target model to acquire, and according to dialectal, individual and stylistic conditions of the adults, they may affect children's phonological development. Here the child used the / r/ sound rather than /l/ in both Mandarin and Taiwanese contexts, the possible explanation might be the speech input from interlocutors.

To uphold this observation, D acquired the approximants earlier than Spanish monolinguals. The use of the flap / r/ sound may indicate his Spanish influenced both Taiwanese and Mandarin words, since the flap / r/ sound do not exist in both these two languages, even he substituted Spanish words beginning with the trill /r/; and this sound is also difficult to pronounce for monolingual Spanish-speaking children.

<u>Mandarin</u>	<u>Target</u>	<u>Gloss</u>	<u>Age</u>
*/rao su/	/lao ʃu/ 老鼠	mouse	1;9
*/ run tai/	/lun tʰai/ 輪胎	wheel	1;9:2
<u>Taiwanese</u>			
*/ siu ri/	/siu li/ 修理	fix	1;10:12
*/ rua/	/lua/ 梳子	comb	1;10:30
<u>Spanish</u>	<u>Target</u>	<u>Gloss</u>	<u>Age</u>
*/ ruda/	/rueda/	wheel	1;4:29
*/kore/	/kore/	run	1;5:4
*/remedio/	/remedio/	medicine	1;8:3
*/relo/	/relox/	watch/clock	1;8:8

(3) the substitution of fricative /f/: another error pattern is "backing", it happens when he moved the place of articulation backwards. It occurred both in his Spanish

and Mandarin languages. He used the velar /xu/ to substitute /f/ the fricative labio-dental sound, as the following examples:

<u>Mandarin</u>	<u>Target</u>	<u>Gloss</u>	<u>Age</u>
* /i-xu/	/i-fu/ 衣服	cloth	1; 1:17
* /xue- tɕi/	/fe- tɕi/ 飛機	airplane	1; 4: 21
<u>Spanish</u>	<u>Target</u>	<u>Gloss</u>	<u>Age</u>
*/xue/	/fue/	he went	1; 6: 4
*/kaxue/	/kafe/	coffee	1; 8: 7

Notice that there's not /f/ consonant in Taiwanese, no Taiwanese words are pronounced with /f/. It is important to see that the particular dialect background has a strong influence in the substitutions (Yavas, M. and Goldstein, B., 2006). In addition, it is observed that the adults whose native language is Taiwanese rarely pronounce /f/ when they speak Mandarin and Spanish. In fact, we can find there's an obvious missing phoneme /f/ in D's grandmother when she speaks Mandarin. Due to the difficult articulation of /f/ sound, it is also deemed that /f/ was the latest sound to acquire in monolinguals in Mandarin; in addition, bilinguals of Mandarin-Taiwanese children could produce this sound only after the age of four. Comparing with Spanish monolingual children, the fricative labio-dental /f/ was acquired by the age of five (Yavas, M. and Goldstein, B., 2006). Thus, the /f/ sound can be considered as one of the most difficult sounds to produce. Hence, it's hard to say if the /xu/ is influenced by Taiwanese, since Taiwanese context was little. Like monolingual children of these languages, we still cannot find the stabilization of this sound in Diego's data.

(4) the deletion of the phoneme /s/ in the final word in Spanish: Spanish is commonly found final words with codas, and the final word /s/ is the most common and easier to be acquired. Previous research showed the acquisition of Spanish codas in monolingual children were around the age of 1;10 or later (Garlant, 2001, Lléo to appear, Roark and Demuth 2000). Garlant (2001) studied the acquisition of codas in monolingual and bilingual Spanish children combining with other Indo-European languages, and the result showed that bilingual children had greater use of word- final phonemes than monolingual children, especially the phoneme /s/ (Lléo, C., Kuchenbrandt, Kehoe and Ttujillo, 2003). Yet, our data demonstrated the lack use of /s/ in the final position.

<u>Spanish</u>	<u>Target</u>	<u>Gloss</u>	<u>Age</u>
*e	es	is	1;5:4-2:0
*do	dos	two	1;3-2:0
* racia	gracias	thank you	1;10:22-2:0

The data show an obvious difference compared with monolingual and bilingual children of the previous research. The omission could be interpreted as the

interference of Mandarin words; The Mandarin Chinese and Taiwanese don't have clusters or codas in the syllable structures; as the data of Taiwanese context is so little that we can't say its interference, but the interference may be due to Mandarin utterances. Another explanation may be due to the lack use of /s/ in Paraguay.

(5) the use of /s/ to replace Mandarin /ɕ/ in Mandarin contexts: interestingly, it is found that D uttered many words pronounced with /ɕ/ in Mandarin with the substitution of /s/.

<u>Mandarin</u>	<u>Target</u>	<u>Gloss</u>	<u>Age</u>
* sin-sin	ɕiŋ-ɕiŋ 星星	star	1;10:11
* san-sin	ʂ An- ɕin 傷心	sad	1;10:30

From the above examples, we can see the subject used backing error, he used the alveolar fricative sound /s/ to replace the alveo-palatal /ɕ/, in other words, he moved the place of articulation backwards. Though the /s/ sound exists in these three languages, there is no /ɕ/ in Taiwanese and Spanish. Therefore, it can be inferred that Diego used /s/ to substitute /ɕ/ in Mandarin due to the interference of Spanish since /s/ was found in many word-initials in his Spanish context .

4.5.2 Vowel interference

From the phonemic inventories, we can see Mandarin vowels are more complicated than Spanish and Taiwanese. The data show Diego could pronounce all simple vowels in Spanish and, but still could not pronounce some in Mandarin and /ə/ Taiwanese.

(1) the use of Spanish /o/ in Mandarin /ɤ/ and Taiwanese /ə /:

<u>Mandarin</u>	<u>Target</u>	<u>Gloss</u>	<u>Age</u>
*/ i ko/	/i k ɤ/ 一個	one	1;3:26
*/ o/	/ ɤ/ 二	two	1;3;30-1;9
<u>Taiwanese</u>	<u>Target</u>	<u>Gloss</u>	<u>Age</u>
/kato /	/kat ɔ / or /kat /ə /剪刀	scissor	1;8:6

(2) the use of Spanish /i/ in Mandarin / y /:

*/i mi/	/ y mi/玉米	corn	1;10:10
*/ i san/	/ y s A n/雨傘	umbrella	1;10:12

The substitution could also be interpreted as the use of an unmarked simple vowel for a more complex vowel (Ingram, D. and Keshavarz, M., 2002). It is generally said that unmarked sounds would be easier than marked sounds to be acquired. Therefore, children would use unmarked sounds as substitutions for marked sounds (Zhu, H. and Dodd, B., 2006). The five simple vowels /a, e, i, o, u/ were less marked than other vowels. Thus, the interference could be interpreted as the use of unmarked simple vowels to more complex ones; and the influence of Spanish vowels can be explained since these vowels are the most frequent sounds in Spanish, and the

use of them was carried over to his Mandarin and Taiwanese words.

5. Conclusion

The aim of the study is to investigate the phonological development of the trilingual child who was exposed to Taiwanese, Spanish and Mandarin simultaneously. It is hypothesized that Spanish was the language of dominance and had a stronger influence than the other two languages, though each language was influenced in different ways, not in one direction only. Law, N. & So, L. (2006:406) have mentioned “bilinguals tend to be dominant in one of their languages”. Similarly, in trilinguals, Spanish was Diego’s dominant language. In addition, one may say the dominant language may develop faster than nondominant language (Fantini, 1985). In contrast to this hypothesis, Law, N. & So, L. (2006) reported that the dominance is not the sole factor affecting the language development, but also the exposure of languages. However, our data show that the exposure of Taiwanese was quite little, but the phonological development in Taiwanese is quite high as Spanish. It might be explained that Taiwanese phonology is simpler than Spanish and Mandarin.

One of the main evidence found in bilingual or multilingual children is the phenomenon of “transfer” or “cross-linguistic influence”. The term refers to the influence of one language system on the other, and it can occur on all linguistic levels (Jeßner, U., 1997). Other explanation reported by Keshavarz & Ingram (2001), saying that the cross-linguistic interference occurs when the two languages may influence each other not only in one direction.

The main conclusion drawn from the present study is that the multilingual child is grown up with three languages since birth. The stronger language is analysed according to the input and exposure of the languages. It can be concluded that the three languages: Taiwanese, Spanish and Mandarin had dynamic relationship, and the three phonologies may influence each other. In other words, the subject may use certain phonemes of one language in the contexts of the other languages. The research indicated that Spanish is the dominant language at that period, but his phonological development of Spanish and Taiwanese are similarly high. Therefore, phonologically, Spanish and Taiwanese might have faster than Mandarin in Diego’s phonological development.

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Cross-linguistic Evidence in Phonology in a Multilingual Child: Taiwanese- Spanish-Mandarin

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Abstract

Phonology is a theoretical concept that aims to account for investigating the sub-field of the sound system. It can analyze the cross-linguistic similarities and differences in early sound acquisition that is developed from studies of monolingual and multilingual children. This paper provides evidence from a multilingual child's early words. The child is exposed to Taiwanese, Spanish and Mandarin simultaneously. The paper aims to evaluate how a child interferes the sounds in three languages in a longitudinal study. The results show the trilingual child has the same development in languages as the monolingual children. The results of the study have implications for understanding language dominance, the role of input, the role of the weaker language and cross-linguistic influence and language transfer.

Key words: phonology, cross-linguistic influence, language transfer

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