

Tone Development in Cantonese-English Bilingual Children: A Case Study

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Introduction

•Cantonese monolingual children normally master their tonal system before the age of two. (Tse, J.K.P., 1978; Tse, A., 1992)

•There were disagreements in the developmental sequences of Cantonese tone. While Tse, J.K.P. (1978) reported that tone 1 was the easiest to be acquired, Tse, A. (1992) claimed that tone 1 was the most difficult to be acquired by the child. Different criteria in determining tone acquisition may account for the differences in findings.

•English-Cantonese bilingual children reported that a longer period is needed for a complete mastery of the Cantonese tonal system due to prosodic interference from English (Law, 2006)

Goal of this study

•Find out the sequence of Cantonese tone acquisition in Cantonese-English Bilingual children.

•See whether the acquisition of tones will be delayed when compared with Cantonese monolingual children due to the interference with the other language of the child.

•Account for some of the error patterns in tone productions by the bilingual child.

•Evaluation of the Methodologies used in studying the acquisition of tone in the literature.

Tonal System in Cantonese

•3 phonetic parameters in tone: Pitch height, contour and duration

•6 Contrastive tones in Cantonese

(high, mid and low entering tones are treated as allotones of tone 1,3 and 6 respectively)

Tone	Syllable	Char	Gloss	Pitch	Description
1	si	詩	poem	55	high level
2	si	史	history	35	high rising
3	si	試	to try	33	mid level
4	si	時	time	21	low falling
5	si	市	city	13	low rising
6	si	是	yes	22	mid-low level

Methodology

Subject

•A Cantonese-dominant Cantonese-English Bilingual child Llywelyn from the Hong Kong Bilingual Child Language Corpus (Yip and Matthews, in press)

Selection of items

•10 thirty-minute audio clips in the Cantonese session between the age of 2;00.12 and 3;04.14

•The following items are excluded from analysis:

- Items with unclear meaning
- Kinship terms (the child may have idiosyncratic ways of pronouncing them)
- Words with several possible tone pronunciations e.g. *go2go3* vs. *go1go3* 'that one'
- Sentence final particles (the child may not know the difference between *aa3* and *aa4*)

Data Transcription

•All the tones were transcribed by the author using the tone notation 1 to 6.

•Tones which cannot be categorized in the adult tonal inventories were treated as non-adult like tones.

Results

Table 1. Accuracy rate for each tonal category from age 2;00.12 to 3;04.14

Age	Tone 1	Tone 2	Tone 3	Tone 4	Tone 5	Tone 6
2:00.12	9% (1/11)	100% (1/1)		67% (2/3)	20% (1/5)	
2:01.13	49% (69/141)	37% (10/27)	89% (33/37)	71% (17/24)	59% (16/27)	71% (10/14)
2:02.29	24% (17/70)	43% (13/30)	22% (14/64)	60% (9/15)	44% (8/18)	56% (15/27)
2:03.14	60% (42/70)	41% (14/34)	64% (29/45)	14% (3/21)	52% (13/25)	64% (35/55)
2:05.10	83% (104/125)	78% (80/102)	85% (77/91)	88% (37/42)	42% (32/76)	54% (43/80)
2:06.20	94% (166/177)	67% (58/86)	82% (93/113)	55% (34/62)	66% (69/104)	82% (129/157)
2:09.07	88% (160/182)	52% (77/147)	80% (85/106)	42% (30/72)	43% (51/118)	73% (117/161)
2:11.29	91% (67/74)	54% (46/85)	80% (37/46)	21% (6/29)	36% (34/94)	70% (82/118)
3:01.04	81% (92/114)	69% (79/115)	75% (49/65)	37% (30/82)	68% (75/111)	75% (100/134)
3:04.14	71% (36/51)	57% (49/86)	78% (28/36)	43% (20/47)	73% (51/70)	91% (69/76)

•The accuracy rate for tone A:

the number of correct productions of tone A by the child / the total number of words with tone A

•The data at the age 2;00.12 is not reliable due to the few number of tokens.

•Results confirmed with Law (2006)'s finding in that the complete mastery of Cantonese tonal system is delayed in bilingual children, no matter the child is Cantonese or English dominant.

•Tone 2 and 4 were the most difficult tones to be acquired by the child, since the accuracy rates for these 2 tonal categories were only around 50% by the age of 3;04.14.

•Developmental sequence of the 6 tones cannot be found using the criteria of tonal accuracy since the error rate of each tonal category was fluctuating with no signs of decrease.

Table 2. Percentage of correct attempts for each tonal category from age 2;00.12 to 3;04.14

Age	Non-adult like	Tone 1	Tone 2	Tone 3	Tone 4	Tone 5	Tone 6
2:00.12	8	50% (1/2)	0% (0/2)	0% (0/1)	67% (2/3)	25% (1/4)	
2:01.13	18	8% (6/75)	53% (10/19)	36% (33/91)	61% (17/28)	59% (16/27)	59% (10/17)
2:02.29	3	46% (13/28)	83% (48/58)	79% (50/63)	74% (26/35)	43% (6/14)	35% (8/23)
2:03.14	16	74% (42/57)	61% (14/23)	37% (29/78)	60% (3/5)	68% (13/19)	67% (35/52)
2:05.10	3	84% (104/124)	60% (78/131)	63% (76/120)	90% (37/41)	70% (32/46)	80% (41/51)
2:06.20	7	79% (166/211)	74% (58/78)	73% (93/127)	79% (34/43)	85% (69/81)	85% (129/152)
2:09.07	10	73% (160/219)	77% (77/100)	53% (85/161)	71% (30/39)	51% (51/101)	75% (117/156)
2:11.29	9	72% (67/93)	77% (46/60)	33% (37/111)	60% (6/10)	63% (34/54)	75% (82/109)
3:01.04	9	80% (92/115)	86% (79/92)	39% (49/127)	79% (30/38)	76% (75/99)	71% (100/141)
3:04.14	12	68% (36/53)	82% (49/60)	49% (28/57)	100% (20/20)	75% (51/68)	72% (69/96)

•The percentage of correct attempts for tone A:

the number of correct productions of tone A by the child / the total number of tone A productions by the child

•Tone 3 was used as the substitution tone for most of the other tonal categories, as shown by the large number of attempts and low percentage of correct attempts.

•Using the emergence of tone as the criteria for tone acquisition, the child can produce all the tonal contrasts by 2;01.13. The sequence of emergence is less clear since no data before 2;00.12 can be obtained from the corpus.

Tone Developmental Errors

•Tonal harmony is proposed to account for some of the error patterns

•Tones within the same phrase or lexical item is being assimilated to the tone of the neighboring syllables

- ma2ma2 ca4 hau2seon1gou1 aa4
mother put lipstick SFP
'Mother is putting on lipstick.' (2:06.20)
- ngo6 m6 zi6dou6 ha6 me6 lai4
I NEG know is what SFP
'I don't know what it is.' (3:00.27)
- ngo3 tung3 keoi3 wan2 ngaan1sik1
I and he find colour
'We are finding colour pencils.' (3:00.27)
- cat1dim2zung1 ngo3 ju3 hei3san3 laa3
seven o'clock I need wake up SFP
'I need to wake up at seven o'clock.' (3:00.27)
- baat1dim1zung1 sik3 je5
eight o'clock eat thing
'eat at eight o'clock.' (3:00.27)
- tung1maa1 go1 dang1
and CL light
'and the light' (3:04.14)

•Analysis of the tone error patterns in monolingual children is needed to see whether this is a universal developmental patterns or this phenomenon is due to prosodic transfer from English in the bilingual child.

Tonal Errors means problems in Tone Acquisition or Lexical Acquisition?

•It is questionable whether the tonal errors were due to the fact that the child was not able to produce the correct tones (due to inability to control the vocal muscle freely) or the child did not know the correct tone for the lexical item, since we observed that the child used many different tones to substitute the correct tone in many lexical items and no regular patterns can be found.

•If the tonal errors were due to immature of the motor skills development, we would predict that the correct tone would be substituted by one particular tone most of the time.

Conclusion

•Cantonese-English Bilingual children showed a delay in the complete mastery of Cantonese tones in lexical items, no matter English is the dominant language or not.

•Methodological issues should be taken care to differentiate tone acquisition from lexical acquisition.

Further Studies

•Carry out more longitudinal studies to minimize individual variation as well as setting up a norm for the acquisition of tone in bilingual children for clinical purpose.

•Carry out cross-sectional studies using picture naming and elicitation tasks to supplement the longitudinal studies to minimize the bias about different occurrence frequency of the lexical items.

Selected References

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