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Language experience and phonological development: a case study of a bicultural/monolingual family in Korea

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Jihye Seong[1]
The State University of New York at Buffalo

Abstract

This case study investigates the influence of maternal speech on a child's phonological acquisition of Korean consonants examining conversational speech data collected from a dyad of a Korean-speaking child (aged 3;8 – 4;1) and his Vietnamese mother - a late Korean learner - for a six-month period. Correlation of the mother's speech accuracy and her child's consonant production were examined. The results showed the child exhibited a delay in phonemic acquisition while his error patterns were not congruent with those of his mother. The mother's Korean phonemic awareness was more accurate than her child's one, and her errors in production was induced by her native language. The findings suggest that the maternal influence is not correlated with the child's phonemic acquisition while it is still probable that his mother's non-salient production may have led difficulties for the child to build phonological contrasts.

Keywords Korean, early language experience, maternal influence, phonological development, language delay

1. Introduction

A large body of studies stated that children's phonological development is guided by their early experience with sets of sounds (or features) (Maye et al. 2002; Yoshida et al. 2010). The children increase their sensitivities to distinguish certain pairs of sounds based upon input of acoustic implementations of sounds (Aslin and Pisoni 1980). Cristià (2011) demonstrated that the more salient the caregivers' acoustic cue was, the better children exhibited in sound discriminations. Hunter and Pisoni (2017) suggested that the quality of phonological representations was affected by both the quantity and the quality of early language input – delayed exposure to language, impoverished language input, and enriched language input – by investigating phonological awareness among different groups of children.

Van Heugten and Johnson (2017) suggested that speech variants in a single language may lead to a different developmental trajectory among children when compared to monolingual children. They found the variability in children's language input affected children' word recognition. This inconsistent and/or insufficient input of sound variants may adversely affect the child's phonemic awareness, which is known to be a significant predictor of latent language development.

The language development of children from immigrant families in South Korea become a huge issue since marriage-based immigrant has been growing for the past two decades (Ministry of Gender Equality and Family 2016; Korean

[1] Jihye Seong is a Ph.D. candidate in Linguistics at the State University of New York at Buffalo. Her areas of interest and research are in phonological developments by first and second language learners. Her recent published work was on English-loanwords production by Korean speakers. Corresponding email: jihyeseo@buffalo.edu

National Statistical Office 2017; Ministry of Justice 2017; Lee, 2008). In this family, immigrant parents' native language is not supported (Kim et al., 2010; Park et al. 2012), and Korean is set as the primary home language (Seol, 2009). The children rarely learn their non-Korean parent's native language (Jeong et al., 2013). In the family, which is a multicultural but monolingual, the linguistic input that the child receives is different from non-immigrant families.

Since immigration is led by immigrant women and they become a main care giver to children. their Korean language proficiency doesn't reach a sufficient level at the time when a child requires linguistic input from his/her mother. Most of the women start learning Korean upon arrival in Korea (National Korean Language Institute 2007) and Lee et al. (2006) reported that 54.2% of the mothers had difficulties when communicating with their children in Korean.

A large body of literatures reported a child's delayed language development was linked with their mother's Korean language proficiency (Choi 2012; Oh et al. 2009; Woo et al. 2008; Chae 2008; Oh 2005; Jeong 2004). Those children showed a delayed development in Korean language. The children's expressive and receptive vocabulary sizes were relatively smaller and morphosyntactic competence was lower than their non-immigrant children counterparts. Kwon et al. (2010) examined thirty-two published papers on children's language development in multicultural families. Their findings demonstrated that children in the multicultural setting showed a delay in phonemic awareness, phonological development, semantic knowledge, and morphological understanding. They pointed out that the mothers' proficiency in Korean and the length of their residence in Korea were the two most dominant factors associated with the child's language development.

When demonstrating the influence of maternal speech on children's language development, most of the studies compared mothers' and children's test performance scores obtained from a standardized assessment tool such as the Urimal Test of Articulation and Phonology (Kim & Shin 2002), Preschool Receptive-Expressive Language Scale (Kim 2000), and Korean Oral Syntax Expression Comprehension Test (Bae et al. 2004). Since the assessment instruments provide age-adjusted criteria based on a large population of normally developing children, it is easy to gauge at which developmental stage a test taker is situated and in what area the participant showed the most difficulty. However, there have been concerns regarding the exploitation of the assessment tool with multicultural families.

First, the assessment tools have limitations in their ability to explain non-developmental errors, such as native language influence on a target language production. Second, merely showing test scores of mothers and children does not elucidate the relation between maternal speech and children's speech. The results simply show in what areas the test taker has the most difficulty. Lastly, the test examines children's language abilities at a specific point of time, but does not provide information on how their linguistic understanding improves over time. Shin and Ahn's study (2008) on sixty-nine children from ages five to ten in multicultural families showed that the older the child was, the better their phonological awareness was.

Consequently, in order to have a comprehensive understanding of children's phonological development in relation to the mother's productions, a different methodological approach is needed. More longitudinal data are needed to determine the linguistic relationship between children and their Korean L2 mothers. This approach also can also provide information as to detailed phonetic variants in mother's speech. Assuming the course of a child's language development will be (at least in part) the result of their interactions with his/her mother, a detailed analysis of the distinctive features of maternal speech should provide a clear picture why the children experienced the language delay under the assumption that the child's language delay is associated with the influence of the mothers' speech.

Extending Selinker's notion of interlanguage (1972) to mother's target language production, mothers may exhibit traits of their native language when producing Korean sounds, or experience difficulties of producing specific sounds or applying certain phonological rules, which may not exist in their native languages. The interlanguage is formed by learners' experiences with another language, and the variabilities in utterance are caused by the differences between learners' L1 and the target language. Following this perspective, the mothers' phonetic variance in her utterance may have caused by the linguistic differences between Vietnamese and Korean: phonemic inventories and phonological constraints. Examining the 'accentedness' in the mothers' speech is important since the resent study by

Considering the mother's speech variation and the recent findings on the role of input variation, it is probable that a child in a multicultural family may demonstrate a different developmental trajectory when compared with children from non-immigrant families. To determine whether a child in a multicultural family is on a typical developmental trajectory, it is crucial to know how normally developing children adopt Korean phonemes and obtain phonological awareness.

The current study unfolds two parts: mother's phonemic awareness, especially consonantal acquisition of Korean and the child's developmental stage of the Korean consonantal awareness compared to children from non-immigrant family. Of two main approaches to studying early child language - one is to examine a large sample of children collected at periodic intervals and the other is to concentrate on a smaller sample collecting dense amount of data - the current study used the latter method to guarantee sufficiently detailed data so as to investigate the complex relationship between language interactions and acquisition to gauge the effect of maternal speech on her child's speech, distinctive characteristics in the mother's speech were examined to determine whether they were reflected in the child's speech.

2. Methodology

2.1 Participants and data collection.

One mother from Vietnam and her son (3;8) participated in the study for six months. The mother is from Ho Chi Mihn City in Vietnam and learned the Korean language upon her arrival to Korea. She is the main care giver to the child and the child spent time with his father at night or on weekends. The

participants do not have any medical disorders related to articulation or hearing (such as cleft-palate, dyslexia, or aphasia).
Speech samples were collected by recording verbal interactions between the mother and her child without interference of the researcher for a six-month period. During this period, the participants were asked to record their free conversations bi-weekly with a hand-held Zoom H1 Handy Recorder and lapel microphone. As a supplementary measure, a picture-based word elicitation task called the Korean Standard Picture Articulation Test was employed (Seok et al. 2002; KS-PART hereafter).

2.2 Data analysis

Speech samples were segmented into word tokens. When deconstructing a speech into tokens, a morphological formation and prosodic boundaries were considered. A bound morpheme was not counted as a single token but included as a part of the content word to which it was affixed. For instance, a content word with a nominative marker, -i/ka was counted as one token instead of two. This inclusion was needed since phonological procedures accompany with morphological formations (Sohn 1999). In the case of a predicate, no matter how many morphemes were inflected, it was counted as one token for the same reason.
Prosodic boundaries based upon accented phrases were considered when decomposing a running speech into tokens. For instance, the word *speak* in Korean can be said either [mal#he] with two accented phrases (one for an object — mal— meaning speech and the other for a predicate —he — meaning do) or [ma.le] with one accented phrase where the weakest sound, [h], is dropped and resyllabified in a formation of CV.CV. The former was counted as two word tokens; the latter was counted as one word token. After parsing, each token was marked either "correct" or "incorrect" by comparing its actual production with the target sound production.
Correctly pronounced words were decomposed into syllable-sized units and then further into a set of phones. Each of the phones was examined for accuracy. As for the mispronounced word tokens, errors were classified into phonemic or phonological errors. A phonemic error occurs when a word token contains only a single mispronounced phoneme. A phonological error occurs when a word token includes one or more mispronounced phones due to the misapplication of a phonological rule, i.e. linking, nasalization, tensing, or aspiration. Of the two error types, word tokens, classified as a phonemic error, were further analyzed since they still included correctly pronounced phonemes in addition to incorrect one.
Of all the phonemes in Korean (nineteen consonants and seven cardinal vowels), the scope of the study lied on understanding of obstruent and phonological processes. To measure the phonemic acquisition, the accuracy rates were calculated as follows: inaccuracy rates of each phoneme = the number of incorrect occurrences / the total number of incorrect and correct occurrences (%). The accuracy of phonemes was determined based on three factors: place of articulation, manner of articulation, and three-way distinctions in obstruents (lenis, fortis, and aspirated). There were five subgroups in manner: plosives [p, t, k, p*, t*, k*, p^h, t^h, k^h], fricatives [s, s*, h], affricates [tʃ, tʃ*, $tʃ^h$], nasals [m, n, ŋ], and a lateral liquid [l]. There were five

subgroups in place: labial [p, p*, pʰ, m], alveolar [t, t*, tʰ, s, s*, n, l], alveo-palatal [tʃ, tʃ*, tʃʰ], velar [k, k*, kʰ], and glottal [h]. The obstruents were divided into three subgroups: lenis [p, t, k, s, h, tʃ], fortis [p*, t*, k*, s*, tʃ*], and aspirated [pʰ, tʰ, kʰ, tʃʰ]

Articulatory and phonological errors were divided into the following types: deletion, insertion, place or manner alternation, tensing or aspiration of obstruents, linking, nasalization, assimilation, and syllabic changes, such as blending multiple syllables or a complete change of syllables. In deletion, the location where the phoneme disappeared was examined along with its manner of articulation. Place alternations were classified into two types: fronting and backing. Contexts where phonological alternations did not apply, i.e. nasalization, consonantal linking, or [h] deletion, were examined as well. The child's speech was examined in two-time frames from ages three to four during the given six-moth period. The first period was the first four months (3;8 – 3;11) and the other was last two months (4;0 – 4;1). The prior studies traced children's phonological development based upon their age by year. In order to compare the findings of the current study with the previous findings, the break was made by age rather than 2-3-month periods. The supplementary phonological assessment test was conducted at 4;2. Performance of each month was included in Appendix.

3. Findings

The literature examining children's production of consonantal phonemes delineates an order of sound acquisition in terms of manner and place (Lee & Kwon 1979; Kwon et al. 1979; Eom 1986 as cited in Kim 1996). In consistent with the previous literature, the phonemic accuracy of the child and mother was examined by place of articulation, manner of articulation, and the three-way distinctions in obstruents.

The correctly pronounced phonemes were categorized by the three factors (place of articulation, manner of articulation, and three-way distinctions in obstruents) and the results are demonstrated in Figure 1-3. Figure 1 demonstrated the percentage of correctly pronounced phonemes in place of articulation. The bar graphs represented the child's data (the first bar is the results when he was 3; the second bar is when he was 4). The line drawn above the bars were the results of mother's. The mother's performance was better than the child's except velar. The child's production was improved as he got older. In the production of bilabial sounds, he outperformed his mother as he turned to four.

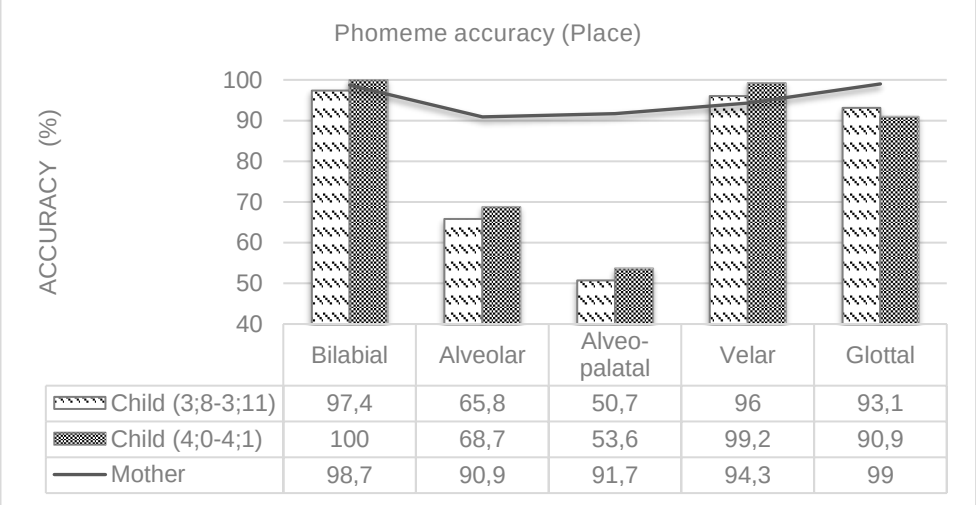


Figure 1. Correctly pronounced phonemes in place of articulation (%)

The results of production in manner of articulation is illustrated in Figure 2. Similarly, the child showed improvements in production as getting older except fricatives. Across all the manners, the mother showed fairly high accuracy rates (over 90%) except liquid (below 70%). Under the low production of the liquid, the child's production of the liquid improved and outperformed his mother's.

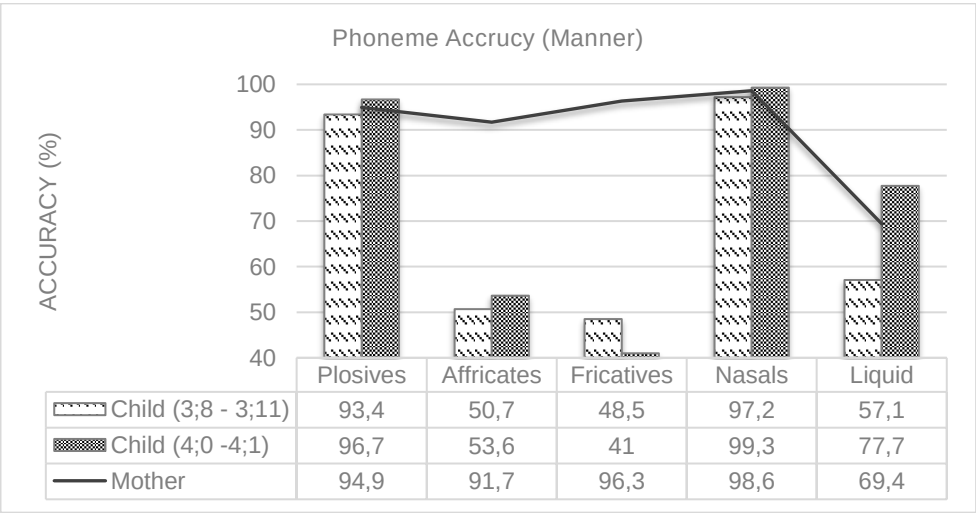


Figure 2. Correctly pronounced phonemes in manner of articulation (%)

The results of the three-way distinction in obstruents were illustrated in Figure 3. The mother exhibited better production then the child did. She showed more difficulties producing fortis sounds, which lacks in her native language (Hwa-Froelich & Edwards 2002). The child increased his production as he got older. Like his mother exhibited, he struggled more with the fortis sounds than the other features.

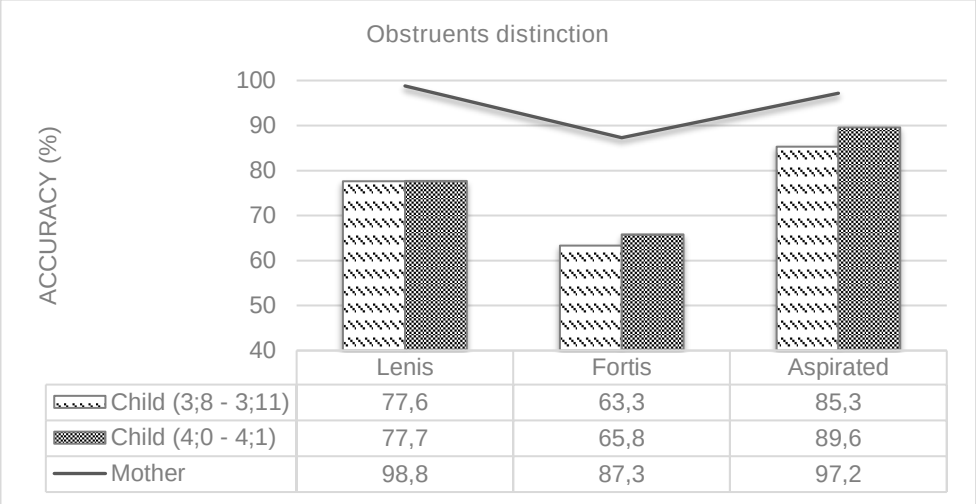


Figure 3. Correctly pronounced obstruents in the three-way distinction (%)

Overall, the results demonstrated that mother's performance was better than that of the child across all three categories (place of articulation, manner of articulation, and a three-way distinction in obstruents). The mother exhibited unbalanced performance; especially showed a lower production of liquid. To examine how the discrepancy between the Vietnamese and Korean sound inventory affected the mother's phonemic production, the Korean consonantal phonemes were divided into two groups: phonemes shared with Vietnamese and ones only in Korean, as seen in Table 1. The numbers after the phoneme represented the percentage of inaccuracy rates.

Table 1
Error rates of phonemes produced by mother (%)

Phonemes shared with Vietnamese	Inaccuracy	Phonemes only in Korean	Inaccuracy
p	0.5	p*	0.5
t	3.2	t*	3.7
k	2.3	k*	8.3
tʰ	1.4	pʰ	0
s	0.7	kʰ	0.7
h	0.5	s*	5.1
m	2.1	tʃ	1.6
n	2.3	tʃ*	2.8
ŋ	1.2	tʃʰ	1.2
l	62.2		

When comparing the inaccuracy rates of the sounds, the difference in the two groups was not great. All of the sounds recorded lower than 10% of inaccuracy rates except the /l/ (over 60%) even though the lateral liquid is shared both Vietnamese and Korean. The results suggested her native language's phonological constraints affected the results not the phonemic discrepancy.

In Vietnamese, only six consonants are allowed in a coda position: /p/, /t/, /k/, /m/, /n/, and /ŋ/ (Cheng, 1991). The syllabic constraints on the /l/ led the errors in /l/. In the data, she showed the highest errors of /l/ especially when it was on the coda position.

The accuracy of each phonemic production was examined in relation to the acquisitional stages (Kim 1996), illustrated in Tables 2 and 3. His developmental stage of each phoneme was compared with the findings in Kim (1996) and Seok et al. (2002). Table 2 exhibited the child's data when he was three. When comparing the child's results with other children of his age, he showed lower accuracy rates on affricates and alveolar fricatives. He had the most difficulties producing a fortis alveolar fricative. When turning four, he improved the production of the aspirated affricate and a lateral liquid as demonstrated in Table 3. However, he still experienced the difficulties in the fortis alveolar fricative and other affricates.

Table 2
Acquisition stage of the child participant (age 3)

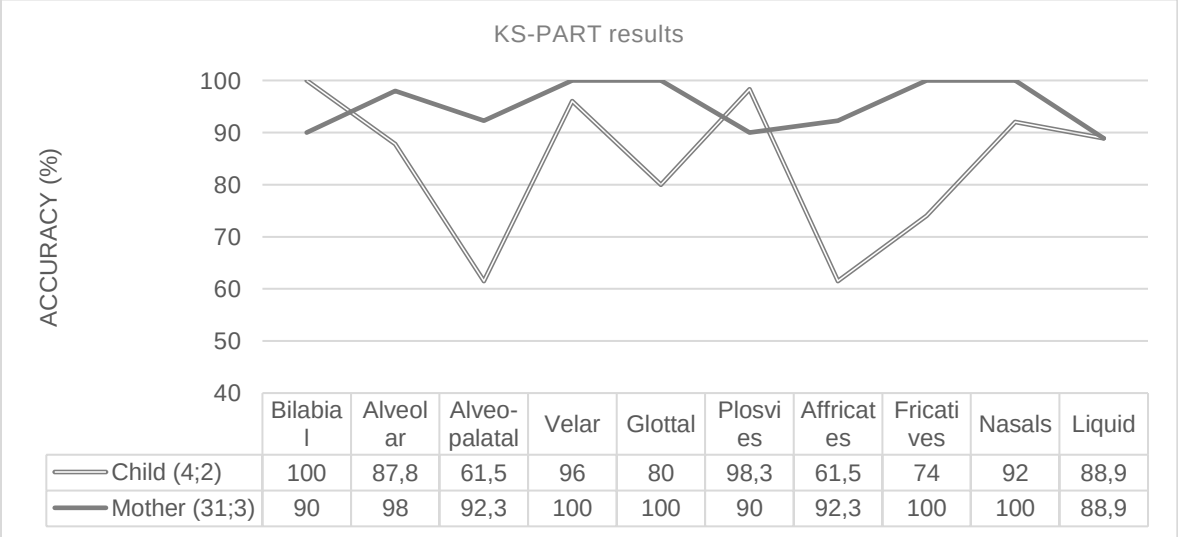
Age	Acquisition (100 – 95%)	Master (94 – 75%)	Customary (74 – 50%)	Emerging (49-25%)	Below 24%
3;0 – 3;11 (Kim 1996; Seok et al. 2002)	p, p^h, p* t, t^h, t* k, k^h, k* n, m, ŋ h	tʃ, tʃ*, $tʃ^h$, s* l	s		
3;8 — 3;11	p^h, p* t k m, n, ŋ	p t*, k* t^h, k^h h	$tʃ^h$ l	tʃ, tʃ* s	s*

Table 3
Acquisition stage of child participant (age 4)

Age	Acquisition (100 – 95%)	Master (94 – 75%)	Customary (74 – 50%)	Emerging (49-25%)	Below 24%
4;0 – 4;11 (Kim 1996;	p, p^h, p* t, t^h, t* k, k^h, k*	s			

Seok et al. 2002)	tʃ, tʃ*, tʃʰ, n, m, ŋ s*, h l				
4;0 — 4;1	p, pʰ, p* t k, kʰ, k* m, n, ŋ	tʰ tʃʰ h l		tʃ, tʃ* s	s*

As a supplementary measurement, KS-PART (Seok et al. 2002) was employed. The test was taken when the child turned to 4;2. As seen in the naturalistic data, mother's performance was better than the child's except bilabial and plosive sounds. The child showed the lowest accuracy on affricates sounds. The child's results were 87.7% of the accuracy while his mother's was 93.7%. According to the age-adjusted norms of KS-PART, the child was one standard deviation below the norm of age four while the mother was at the four-year-old norm.



	Bilabial	Alveolar	Alveo-palatal	Velar	Glottal	Plosives	Affricates	Fricatives	Nasals	Liquid
Child (4;2)	100	87,8	61,5	96	80	98,3	61,5	74	92	88,9
Mother (31;3)	90	98	92,3	100	100	90	92,3	100	100	88,9

Figure 4. Results of KS-PART by the child and the mother

The types of phonological errors produced by the mother and her child was examined as listed in Table 4. Of all the errors committed in the given period, how much each phonological error type contributed was calculated. The lowest low showed the total number of phonological errors. The raw counted number was in the parenthesis. The number provided in each table showed the percentage of each phonological error.

Table 4
Articulatory error types (%, raw counts in parenthesis)

Types	Child		Mother
	3;8 — 3;11	4;0 – 4;11	30; 9 – 31;2
Insertion	1.5 (7)	0 (0)	2.2 (13)
Deletion: Onset	5.7 (27)	4.0 (5)	0.9 (5)
Deletion: Coda	7.5 (36)	5.6 (7)	2.6 (15)
Place: Fronting	18.7 (89)	23.2 (29)	2.4 (14)
Place: Backing	6.1 (29)	5.6 (7)	24.4 (142)
Manner: altered to plosives	41.1 (196)	51.2 (64)	1.4 (8)
Manner: altered to affricates	1.3 (6)	2.4 (3)	0 (0)
Manner: altered to fricatives	0.8 (4)	0.8 (1)	0 (0)
Manner: altered to nasals	4.4 (21)	0.8 (1)	44.2 (257)
Manner: altered to liquids	0.2 (1)	0 (0)	0.5 (3)
Plain/Aspirated to Fortis	6.3 (30)	4.0 (5)	2.9 (17)
Fortis to Plain/Aspirated	0.6 (3)	0 (0)	15.3 (89)
Plain/Fortis to Aspirated	2.9 (14)	2.4 (3)	0.9 (5)
Aspirated to Plain/Fortis	2.9 (14)	0 (0)	2.2 (13)
Total	477	125	581

Both mother and the child showed similar patterns in deletion. Both showed that deletion was more common than insertion. Of the two places (onset or coda), phonemes appearing in the coda position were more prone to be deleted. For the rest of types, their patterns were unrelated. In place alternation, the child showed more errors in fronting while the mother showed more backing. In manner change, the child altered sounds to plosives while his mother was prone to change sounds to nasals. In distinction of obstruents, both the child and mother showed more errors on fortition (either fortifying non fortis plosives or non-fortifying non-fortis obstruents) than aspiration fortition (either aspirating non-aspirated plosives or non-aspirating non-aspirated plosives). However, the directionality of the fortition and aspiration errors differed. The child tended to produce non-fortis obstruents as fortis obstruents while his mother produced fortis obstruents as lenis obstruents. Likewise, the

child aspirated sounds more often while his mother did not aspirate sounds that needed to be aspirated.
Other types of errors related to the phonological processes were examined, including syllabification (a morphophonological process when a bound morpheme is attached), nasalization, and aspiration (alternation of plain plosives to aspirated due to preceding [h] sound) and so on.

Table 5
Other articulatory error types (%, raw counts in parenthesis)

Types	Child		Mother
	3;8 — 3;11	4;0 – 4;11	30; 9 – 31;2
No application of syllabification	12.5 (2)	25 (1)	45.2 (19)
Alternation of a syllable (C(V))	75 (12)	25 (1)	14.3 (6)
Deletion of a syllable (C(V))	12.5 (2)	50 (2)	-
No application of nasal assimilation	-	-	21.4 (9)
Voiced	-	-	19 (8)
Total	16	4	42

Of the phonological errors, the child exhibited the highest errors in a syllable alternation (75%). Not a phonemic segment but a set of phonemes consisting of a syllable was. Other errors that he showed were a deletion of a syllable and no application of syllabification, 13.5% respectively. Unlike the child, the mother exhibited the greatest error in syllabification. The syllabification accompanies with a morphological formation. For instance, when a nominative case marker, **-i**, is attached to a closed syllable (CV**C**), syllables are rearranged as CV.**Ci**. Similarly, the nasal assimilation occurred through a morphological formation: a preceding consonant is nasalized when followed by a nasal sound through conjugation. When a morpheme whose initial sound is a nasal like, *-nin.de* meaning *but*, is attached to an independent morpheme, *e**p***, it is realized as /e**m**.nin.de/. The results were attributed to mother's lack of understanding in a morphophonological process in Korean. Another type of error showed that mother over-employed her Vietnamese sound contrasts. Normally, word-initial obstruents are voiceless in Korean while they are voiced in an intervocalic condition. However, she often altered the voiceless feature of word-initial obstruents into voiced. Her language experience in two languages was represented in these errors.

4. Discussion and Conclusions

This study is to demonstrate how the maternal speech influences the child phonological influences. The accented variants of the immigrant mother may have affected on the child phonological acquisition. In order to attest the hypothesis, speech data obtained from both the child and his mother were examined in the following aspects: phonemic accuracy in production, patterns associated with production errors, and phonological errors related to influence of native language. Overall, the results showed that the child showed an

increased accuracy in phonemic production over time, and the improvement is unrelated to the types of errors that his mother made.

First, the child in this study demonstrated the similar developmental trajectory of acquiring phonemes as attested in the previous literature. The child showed acquisition of anterior sounds (bilabials) before post-arterial sounds (velars and glottals) and higher accuracy in nasals and plosives than affricates and fricatives. However, the child showed a delay in acquiring the affricates [tʃ] and [tʃ*], and fricatives [s] and [s*] (below 50% of the accuracy) in free speech. The accuracy of [s*] was surprisingly lower than 24%. According to Seok et al. (2008), three-year olds exhibited over 80% accuracy in production of affricates and showed over 50% accuracy in [s] and [s*]. The child's performance of those sounds was significantly low. When examining the mother's performance of those sounds, she showed over 90% accuracy in production [tʃ] and [s] and over 75% accuracy in [s*] and [tʃ*].

The late acquisition of those sounds, which are [tʃ], [tʃ*] and [s*] could be explained by the child's individual variation. It is probable that difficulties of forming articulatory gestures when producing those sounds may have caused the delay. Across the data, the child altered [s*] to [t*], [tʃ] to [t], and [tʃ*] to [t*] quite consistently. That is, he maintained a three-way distinction among obstruents while altering manner to plosives. His perceptual awareness of those sounds would be better than his production as evidenced by maintaining the fortis feature. The alternation was motivated by difficulties of employing tongue laminar and body when articulating fricatives and affricates. Fronting his articulators and simplifying the manners — from keeping a narrow gap to make a blockage and from a sequence of movements to one blocking movement — would be his strategy for those sounds.

The mother exhibited the lowest accuracy of the lateral sound across all phonemes. Her errors occurred when the liquid appeared at coda positions. She altered the coda [l] in three different ways: deletion, alternation to [n], or alternation to [ŋ]. When examining the coda [l], 49% changed to [ŋ]; 45% altered to [n]; and 15% were deleted. There were two cases when coda position [l] altered to either [m] or [t]. However, the coda [l] predominantly altered to either [ŋ] or [n]. When speculating the sonority of the liquid and nasals, the direction of manner alternation can be expected. However, in case of [ŋ], the place change from alveolar to velar was odd compared to the alternation to [n], which shares the same place feature of [l]. Thus, it was decided to examine neighboring contexts where [ŋ] and [n] appeared.

In the context where the coda [1] was altered to [ŋ], the neighboring environment 53% of the time. Nonetheless, in 10.7% of the cases, the sound following the liquid was an alveolar. The coda [l] was altered to [n] when followed by an alveolar sound 21.5% of the time. There were still 14.9% of the cases when it was followed by a velar sound. It is hard to state that place feature of the following consonants has led to the choice of [n] and [ŋ]. However, over half of the cases when [l] altered to [ŋ] were followed by a following velar sound. Thus, what has made the speaker alter the coda [l]? The reflection of constraints imposed by Vietnamese phonology has affected the mother's speech. There are only six consonants that can appear on a coda, which are [p], [t], [k], [m], [n], and [ŋ] (Cheng 1991). The lateral approximant exists in the Vietnamese phonemic inventory; however, it does not appear in

syllabic final position. Due to the influence of her native language (L1 hereafter), the coda [l] altered to other nasal sounds. In case of Korean, of the 19 consonantal phonemes, seven of them can appear on the coda: [p], [t], [k], [m], [n], [ŋ] and [l] (Sohn, 1999). The syllabic constraint affected the low accuracy in the coda /l/ production.

Then, would the mother's low accuracy in the /l/ production affect child's acquisition of the /l/ sound? The child also exhibited a high error in the liquid. Over time, however, his accuracy of [l] was improved from a customary level (50.3%) to a mastery level (78.2%), while the mother's accuracy of [l] production remained at a mastery level of 68.6%. The child increased his production of [l] with prevailing errors of [l] in the mother's speech. The results demonstrate that the child developed his phonemic awareness even though he was exposed to erroneous sounds. Similar findings were obtained in other sounds involving bilabial and velar, and plosives and nasals.

When examining errors other than errors related to phonemic articulation, the child exhibited more errors of alternation or deletion of syllables, which corresponded to 85% of the phonological errors. The child showed the errors when he did not know a word correctly. He corrected his errors with the aid of his mother. Whenever the child misproduced a word, his mother corrected it and helped him recall the word with detailed descriptions of the word or anecdotes associated with the word. It is probable that such syllabic alternation and deletion were caused by his lexicon. When he could not correctly recall the words, he produced them in ill forms with the errors. The mother's phonological errors were involved with a resyllabification, which corresponded to 44.2%. Most of the consonantal linking accompanied morphological formations with an attachment of grammatical morphemes. When the morpheme is attached to a closed syllable, a coda of the closed syllable moved to an onset in the following syllable, which ultimately rearranges the syllables in a formation of CV.CV. The mother failed at making the consonantal movement. Another type of errors was nasalization. A consonant at a coda position altered to nasal sounds when followed by nasal sounds. She failed at applying the nasal assimilation, which accounted for 20% of errors. 13% of the errors were involved with syllabic alternation. This alternation was different from the child's one. Her errors were more related to selecting an incorrect grammatical morpheme, which is an error of morphology rather than in phonology. Under the influence of her L1, she was prone to alter word-initial voiceless plosives into voiced ones. While Vietnamese has a voicing distinction, Korean does not distinguish plosives in voicing while lenis plosives become voiced intervocalic conditions.

Overall, the features of this maternal speech were not reflected in the child's speech. The child has been exposed to varying sounds, which came from his mother and other Korean monolingual speakers. His delay in phoneme acquisition was affected by a low production of a few specific sounds: affricates and fricatives. His strategy of altering the manner seemed to keep the production rates of those sounds lower than the other sounds. His mother altered the coda [l] and demonstrated a low accuracy rate of the sound. However, the child improved his production of [l]. The influence of the maternal speech was not a significant factor influencing the child's

phonological development. The impact of the maternal speech may be mitigated since the child must have received linguistic input not only from his mother but also from other language models such as his other family members or peers. It is probable that a child constantly reshapes linguistic notions in his mind with his own processing abilities.

The assessment tool, KS-PART, represented a similar pattern of phonemic or articulatory errors though there were a few inconsistent cases. The tool can provide a brief glimpse of phonemic awareness of participants. In addition, it allows for us to examine each phoneme at different positions of a syllable within a word. It is useful when investigating the contextual influence on a phoneme. However, it does not reflect a deeper analysis of the morphophonological process since the assessment only uses a selected number of words where morphological formation is not applied.

The current case study focused on only one mother and child dyad and the results may not extend to a larger population. However, it presents empirical evidence suggesting that the influence of maternal L2 speech may not negatively impact the child's phonological development. This contradicts what previous studies had argued. Park and Kim (2014) provided similar findings when investigating the phonological awareness of twenty-one children aged from three to seven in multicultural families and another twenty-one non-immigrant children using Assessment of Phonology and Articulation for Children (Kim et al. 2007). The results showed that both groups displayed no differences. There could be other factors associated with the child's language delay, which are frequently observed in multicultural families. Choi and Hwang (2009) suggested the child's language development was influenced not only by their mother's proficiency in Korean but also by aspects such as the parents' educational levels and income levels. Ahn and Shin (2008) suggested similar results by pointing out the influence of socio-cultural backgrounds on children's phonological development. It has been well known that children's language abilities are affected by the income-level of families, which was also closely linked with home literacy environment (Payne et al. 1994). Children from low socio-economic status (SES) backgrounds were more likely to experience language delay than those from high-SES backgrounds (Ginsborg 2006).

In sum, the current study examined an influence of maternal speech on a child's phonological by examining one Vietnamese mother and child from a multicultural family. The results demonstrated that there existed no correlation between the maternal speech and the child's speech when examining phonemic awareness, articulatory error types, and phonological error patterns. It is suggested that the mother's influence on the child's phonological development might not be a significant factor. However, this finding cannot exclude the possibility that mother's phonological realizations caused the language delay. Also, it is probable that the prevalent language delay observed in multicultural families may be associated with other factors, which are related with socio-economic backgrounds.

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Appendix

The child's development of phonemic accuracy (3;8 – 4;1)

Age	Acquisition (100 – 95%)	Master (94 – 75%)	Customary (74 – 50%)	Emerging (49-25%)	(24-0%)
3;8	k, p k*, p* k^h, p^h h m, n	t ŋ l	t* t^h $tʃ^h$	s tʃ, tʃ*	s*
3;9	t k*, p*, t* p^h h m, n, ŋ	k, p k^h, t^h		s* tʃ, $tʃ^h$, tʃ* l	s
3;10	k, t k^h, p^h n, ŋ $tʃ^h$	p k* t^h h m	tʃ*	s tʃ l	s*
3;11	k, t k*, p* k^h, p^h m, n, ŋ	p t* t^h h $tʃ^h$	s tʃ	tʃ* l	s*
4;0	k, p, t k*, p*, t* k^h, t^h h m, n, ŋ $tʃ^h$		t' l	s tʃ, tʃ*	s*
4;1	k, p, t k^h, t^h, p^h m, n, ŋ	h l	tʃ, $tʃ^h$	s tʃ*	s*