Bilingual phonological interaction as a source of variation in acquisition patterns

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One source of variation in phonological acquisition is difference in the frequency and complexity of phonological structure in the input. Bilingual phonological acquisition provides an interesting case, since bilinguals must learn the same system as monolinguals for each language, but are confronted with different overall input compared to monolinguals. In what ways do bilingual and monolingual phonological acquisition differ, and what causes this variation?

Research has shown growing evidence that bilinguals acquire two separate phonological systems, but that these systems interact in acquisition (Paradis & Genesee, 1996). For example, Lleó et al. (2003) showed that Spanish-German simultaneous bilinguals (ages 1-3 yrs.) produced target singleton codas in Spanish with greater structural accuracy than monolinguals. However, bilinguals were similar to monolinguals in their structural production accuracy for German codas. Lleó et al. argued that bilinguals' accelerated learning of codas in Spanish resulted from their exposure to German, which uses singleton codas more frequently. Interaction between the bilinguals' two systems was a source of variation in acquisition such that bilingual acquisition of Spanish codas proceeded differently from monolingual acquisition. While Lleó et al. found evidence of bilinguals' higher structural coda accuracy, segmental accuracy remains unknown. Less frequent exposure to each type of coda could result in deceleration. Additionally, exposure to more complex kinds of a given syllable type could aid structural or segmental acquisition.

Our study addresses structural and segmental acquisition of singleton codas and onset clusters by Spanish and English mono- and bilingual children. We hypothesize that frequency of exposure is tied to acceleration and deceleration, while complexity is tied to acceleration. In English, codas are more frequent and more varied compared to Spanish. We predict bilinguals' acquisition of codas will be accelerated compared to Spanish monolinguals, but decelerated compared to English monolinguals due to less frequent exposure. Onset clusters are similarly frequent, but differently complex in each language; English allows 3-element clusters, and Spanish approximant-liquid clusters (Barlow, 2003) have smaller sonority distances. We predict accelerated bilingual acquisition of onset clusters compared to monolinguals in each language.

Participants were 15 children (5 monolingual English, mean: 38.6 mo; 5 monolingual Spanish, mean: 39.1 mo.; 5 early bilingual Spanish-English, mean: 44.1 mo.) from the Southern California area. Data were transcribed participant productions of target singleton codas and onset clusters, elicited using phonological probes targeting all consonants in all positions (onset clusters: 77 English, 41 Spanish; singleton codas: 187 English, 94 Spanish). Analysis comprised structural and segmental production accuracy rates, where structural accuracy counted consonant substitutions as hits and segmental accuracy counted them as misses.

Mixed models showed significant differences between bilinguals' and monolinguals' production accuracies in both analyses for both positions (Table 1-2). Bilinguals' onset cluster productions were more accurate than monolinguals' in both languages, while their English coda productions were less accurate than English monolinguals'. Spanish coda production accuracy did not differ between bilinguals and monolinguals.

As predicted, bilinguals exhibited decelerated singleton coda acquisition compared to English monolinguals due to less frequent exposure. However, bilinguals' acquisition of codas was not accelerated compared to Spanish monolinguals, unlike Lleó et al.'s findings, possibly due to differences in participant age, language background, or data collection methods. Finally, bilinguals showed accelerated acquisition of onset clusters in both languages due to exposure to more complex types of onset clusters across languages compared to monolinguals in either language, suggesting that frequency and complexity are both sources of interaction and variation in bilingual acquisition.

Language: English	Syllabic Position	Participant Background	Mean Production Accuracy (Percent)	Standard Deviation	Significance
Segmental Analysis	Onset Cluster	Monolingual	0.57	0.498	*
		Bilingual	0.68	0.468	(F=6.275, p<.05)
	Singleton Coda	Monolingual	0.66	0.473	*
		Bilingual	0.57	0.495	(F=4.892, p<.05)
Structural Analysis	Onset Cluster	Monolingual	0.67	0.472	*
		Bilingual	0.79	0.407	(F=10.334, p<.01)
	Singleton Coda	Monolingual	0.86	0.347	*
		Bilingual	0.67	0.469	(F=30.471, p<.001)

Table 1. English Segmental and Structural Analysis Results

Language: Spanish	Syllabic Position	Participant Background	Mean Production Accuracy (Percent)	Standard Deviation	Significance
Segmental Analysis	Onset Cluster	Monolingual	0.33	0.495	*
		Bilingual	0.58	0.471	(F=10.969, p<.01)
	Singleton Coda	Monolingual	0.59	0.493	NS
		Bilingual	0.72	0.448	(F=2.271, p=.132)
Structural Analysis	Onset Cluster	Monolingual	0.4	0.492	*
		Bilingual	0.84	0.369	(F=51.745, p<.001)
	Singleton Coda	Monolingual	0.67	0.472	NS
		Bilingual	0.78	0.415	(F=.725, p=.395)

Table 2. Spanish Segmental and Structural Analysis Results

References

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