Onset Cluster Adaptation in Persian

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Introduction: In Persian, onset clusters are banned. Borrowed loanwords with onset clusters undergo adjustments to comply with Persian syllable structure. Word-medial clusters undergo re-syllabification, with the initial consonant moving to the previous syllable's coda: *telegram* → Persian [te.leg.rɑm]. However, in word-initial clusters, an epenthetic vowel is inserted either peripherally, *ski* → Persian [ʔes.ki], or internally, *traffic* → Persian [te.ra.fik] (Ghorbanpour et al., 2019).

Formal vs. Colloquial Persian: Persian has two variants: formal and colloquial. There are phonological distinctions between these two variants. Colloquial Persian exhibits coda simplification (e.g., [nist] → [nis]) and vowel quality changes before nasals (e.g., [xɑ.ne] → [xu.ne]) (Assadi, 2007; Ariyaee, 2019). This study finds that in colloquial native Persian words with three or more syllables, the vowel /e/ is consistently deleted in the second syllable and the word is re-syllabified if the preceding syllable is open. Only /e/ is deleted, with other vowels (/ɑ/, /æ/, /o/, /i/, and /u/) remaining unaffected (see Table 1).

Table 1: Native Persian words for vowel deletion

Formal Persian	Colloquial Persian	Gloss
[kɑ.**re**.gær]	[kɑr.gær]	Worker
[ʔɑ.**ze**.mun]	[ʔɑz.mun]	Exam
[be.**se**.por]	[bes.por]	Delegate
[ʔɑ.**ze**.mɑ.jeʃ.gɑh]	[ʔɑz.mɑ.jeʃ.gɑh]	Laboratory
[ʔɑ.r**ɑ**.meʃ]	*[ʔɑr.meʃ]	Peace
[ʔɑ.r**ɑ**.jeʃ.gɑh]	*[ʔɑr.jeʃ.gɑh]	Barber's
[no.d͡ʒ**æ**.vɑn]	*[nod͡ʒ.vɑn]	Teenager
[ʔɑ.r**æ**.mi.dæn]	*[ʔɑr.mi.dæn]	To die
[pæ.r**i**.ʃɑn]	*[pær.ʃɑn]	Upset
[xæ.z**i**.dæn]	*[xæz.dæn]	To crawl
[ʔɑ.l**u**.de]	*[ʔɑl.de]	Polluted
[Fo.r**u**.ʃæn.de]	*[For.ʃæn.de]	Seller
[be.g**o**.ʃɑ]	*[beg.ʃɑ]	Open!
[be.g**o**.zin]	*[beg.zin]	Choose!

Gap: Little research exists on the distinction between formal and colloquial Persian, particularly in their differences in adapting English loanwords. Considering these, I propose that colloquial Persian employs metathesis instead of internal epenthesis when adapting stop + liquid onset clusters in English loanwords. This suggests the presence of two distinct grammars for adapting English loanwords into the two Persian variants (see Table 2).

Table 2: English loanwords in both variants of Persian

English Loanwords	Formal Persian	Colloquial Persian
/prəfesər/	[Po.r**o**.fo.sor]	[Por.fo.sor]
/prəməʊʃn/	[po.r**o**.mo.ʃen]	[por.mo.ʃen]
/prəfeʃənl/	[po.r**o**.fe.ʃe.nal]	[por.fe.ʃe.nal]
/prəʊtəkɒl/	[po.r**o**.to.kol]	[por.to.kol]
/prəʊtɒn/	[po.r**o**.ton]	[por.ton]
/blutuθ/	[bu.l**u**.tuθ]	[bul.tuθ]
/brutl/	[bu.r**u**.tal]	[bur.tal]
/ɡlukəʊs/	[ɡo.l**o**.koz]	[ɡol.koz]
/krəʊməsoʊm/	[ko.r**o**.mo.zom]	[kor.mo.zom]
/krɒkədaıl/	[ko.r**o**.ko.dil]	[kor.ko.dil]
/klɔrəfıl/	[ko.l**o**.ro.fil]	[kol.ro.fil]

Methodology: For the native Persian dataset, tetrasyllabic and longer Persian words were chosen from a contemporary Persian dictionary (Moshiri, 2009) and adapted into colloquial Persian by the author, a native Persian speaker. English loanwords with onset clusters were compiled and adapted into colloquial Persian by the author. The adaptations were validated through consultation with three native Persian speakers, and the data were analyzed using Optimality Theory (Prince & Smolensky, 2004).

Analysis: Ghorbanpour et al. (2019) proposed constraints and ranking for adapting every English loanword into Persian. However, my analysis reveals challenges for this approach in distinguishing the two Persian variants. Table 3 shows that the colloquial variant [por.fo.sor] cannot be the winner as it is harmonically bounded (McCarthy 2008). This highlights the need for a distinct analysis for adapting loanwords into colloquial Persian. I propose metathesis as the most economical and straightforward method for adapting English loanwords with stop + liquid clusters into colloquial Persian, with English serving as the UR for colloquial Persian. Table 4 illustrates the new constraints and ranking for this purpose. Table 5 presents an alternative hypothesis suggesting that the colloquial variant of loanwords derives from formal Persian. However, this hypothesis fails as colloquial Persian is harmonically bounded and cannot be the winner.

Ghorbanpour et al. (2019) proposed constraints:
ONSET, *COMPLEX-ONSET ≫ MAX-IO ≫ DEP-V ≫ SYLL-CON ≫ CONTIGUITY ≫ DEP-C ≫ NO-CODA

Table 3. How Ghorbanpour et al.'s (2019) constraint ranking operates for 'professor'

/$p_1r_2ə_3f_4e_5s_6ə_7r_8$/	Onset	*Comp-Ons	Max	Dep-V	Syll-Con	Contig	Dep-C	No-Coda
→ [$p_1o_9.r_2o_3.f_4o_5.s_6o_7r_8$] *Formal Persian*				*		*		*
[$p_1o_9r_2.f_4o_5.s_6o_7r_8$] *Colloquial Persian*			*!	*		*		**

Table 4: My proposed constraint ranking

/$p_1r_2ə_3f_4e_5s_6ə_7r_8$/	Onset	*Comp-Ons	Dep	Linearity	No-Coda
→ [$p_1o_3r_2.f_4o_5.s_6o_7r_8$] *Colloquial Persian*				*	**
[$p_1o_9.r_2o_3.f_4o_5.s_6o_7r_8$] *Formal Persian*			*!		*

Table 5: Colloquial Persian is derived from Formal Persian

/$p_1o_2r_3o_4f_5o_6s_7o_8r_9$/ *Formal Persian*	Onset	*Comp-Ons	Reduce	Max	Dep	NoCoda
→ [$p_1o_2.r_3o_4.f_5o_6.s_7o_8r_9$] *Formal Persian*						*
[$p_1o_2r_3.f_5o_6.s_7o_8r_9$] *Colloquial Persian*				*!		**

Conclusion: In native Persian words, /e/ deletion results in closed and heavy syllables. Metathesis in the colloquial variant of loanwords achieves the same effect. This implies that colloquial Persian conspires around two distinct processes to favor shorter words, indicating the existence of separate grammars for its two variants.

Keywords: Loanword phonology, Persian, metathesis, Optimality Theory

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